



Abstracts for the

## Tri-Society Head and Neck Oncology Meeting

Singapore, 1-3 September 2011

<http://www.headneckmeeting.sg/>

**Jointly hosted by the Australian and New Zealand  
Head & Neck Cancer Society, the Hong Kong Head  
and Neck Society and the Society of Otolaryngology  
Head and Neck Surgery Singapore**



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# Tri-Society Head and Neck Oncology Meeting

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## Invited Lectures

### **Role of altered fractionation in the era of concurrent chemoradiation**

Jens Overgaard

*Department of Experimental Clinical Oncology,  
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One of the most investigated areas in the last decades has been the importance of modifying the fractionation schedules in order to achieve an improved therapeutic ratio in radiotherapy. Three principles have been addressed in the randomized trials where the control arm normally has been conventional fractionation. One being the issue of hyperfractionation where more fractions with smaller dose per fraction are given to a higher total dose; accelerated fractionation where the same dose and number of fractions are given in a shorter overall treatment time, and a combination of the two. The results have shown that such a modification involving both acceleration and an increased total dose is likely to give a better tumour control, but at the same time the window for performing such a modification is limited when normal tissue morbidity is taken into account. However, the data clearly indicated that the response to accelerated fractionation is heterogeneous and that tumour repopulation may be linked with factors influencing control of tumour differentiation and proliferation. Poor histopathological differentiation and lack of EGFR expression may indicate that such mechanisms are not functioning. The benefit of accelerated fractionation may also depend on tumor localization (T or N site); HPV-status and combination with other modalities. With the background in the large randomized trials and a subsequent meta-analysis will an overview and update of the fractionation principles for head and neck cancer be presented with special focus on the biological heterogeneity and its therapeutic implications.

### **The use of anti-EGFR therapies to enhance conventional treatments in head and neck cancer**

James Bonner

*University of Alabama at Birmingham, USA*

Head and neck cancers have been known to show high levels of Epidermal Growth Factor Receptor (EGFR) expression for many years. Also, studies

showed that the stimulation of EGFR resulted in the promotion of cellular growth. Likewise, investigations that explored the inhibition of EGFR signaling showed decreased cellular growth and increased apoptosis. This inhibition of EGFR was also associated with decreased angiogenesis. More importantly, studies emerged that showed a correlation with increased levels of EGFR and decrease locoregional control and survival for patients with head and neck cancer who were treated with radiotherapy. Therefore, it was hypothesized that the inhibition of EGFR may lead to improved locoregional control and survival for this group of patients. An early Phase IB/IIA trial showed that the anti-EGFR antibody cetuximab and radiation could be safely combined for the treatment of unresectable locoregionally advanced head and neck cancer (Bonner et al, J Clin Oncol, 18:47s-53s, 2000). Also, this early study showed a promising complete response rate in 13 of the 15 evaluable patients on the trial. Therefore, a Phase III trial was performed in order to compare this regimen of radiotherapy with weekly cetuximab (8 infusions) to radiotherapy alone for patients with locoregionally advanced head and neck cancer (Bonner et al, Lancet Oncol, 11(1):21-28, 2010). The 3 and 5 year survival results showed 10% absolute improvements in survival (cetuximab + RT: 46% vs. RT alone: 36% at 5 years). Also, the addition of cetuximab to radiotherapy did not increase the incidence of grade 3/4 mucositis or dysphagia. An evaluation of the time course of mucositis and dysphagia revealed that cetuximab did not alter the time to onset or time to resolution of grade 3/4 mucositis or dysphagia. Based on the promising results employing cetuximab and radiotherapy, numerous investigations have been performed to evaluate new combinations of cetuximab and chemoradiotherapy for patients with locoregionally advanced head and neck cancer. These studies will be reviewed. Also, other anti-EGFR agents are being studied in various combinations with chemotherapy or radiotherapy. Finally, investigations are being performed to study combinations of targeted agents that inhibit multiple critical points in EGFR signaling or more than one signaling pathway.



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## Head and neck cancers in the developing world

William Wei

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According to the World Bank definition those countries with annual General National Income per capita less than US\$ 3,945 are recognized as developing countries. The difficulties in studying the wide variety of head and neck cancer in the developing world are multiple. The collection of clinical information, the evaluation of disease, the treatment and follow up have limitations. We use the cancer of the larynx in China study as an example to illustrate these. Thirteen leading Institutions/hospitals in different geographic regions in China contributed information of patients with laryngeal cancer that they have managed from 2000 to 2005. This included 1,848 patients. There were 1,633 male and 215 female patients, their age ranged from 18 to 105 years, median 61 years. Among them, 1,561 patients (84.5%) were smokers and the commonest presenting symptom was hoarseness. The location of the main tumour was highest in the glottic region, 1,187 (64.2%); while around 29% of patients had stage III disease. The management ranged from radical resection of larynx or pharynx to transoral laser resection. The patients in this study were followed up for a median period of 37 months. The overall disease free survival rate for the whole group at 5 years was 75.6%. A uniform data collection system together with enthusiasm to participate in collaborative research in developing countries will gather those essential information to improve our understanding of head and neck cancer. The Head and Neck Societies in the developing countries should take a lead in the co-ordination.

## Future considerations in facial reconstruction

Fu-Chan Wei

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Severe facial deformity imposes functional, esthetic, occupational, financial and psychological impacts to the patients. The main principles of reconstructions remain as "replace like with like". The facial subunit and special features such as periorbital region, nose, ear and commissural structures should be appreciated. Microsurgical free tissue transfer has offered a good solution for reconstruction of many

defects involving soft tissue, coverage and bone. Recent advances in free tissue transfers have greatly improved the results of both form and function of a facial defect resulted from congenital, traumatic or after oncological resection. For a total or subtotal facial defect, composite tissue allotransplantation (face transplant) may hold a promise

## Cyberknife: Clinical applications in head and neck

Peter C Levendag, David N Teguh, Abraham Al-Mamgani

*Department of Radiotherapy, Erasmus Medical Center - Daniel den Hoed, Rotterdam, The Netherlands*

**Purpose:** To establish the role as per protocol of the effectiveness of a Cyberknife in the treatment of cancer of the oropharynx (OP; 10 base of tongue cancers, 26 tonsillar fossa tumors) and cancer of the nasopharynx (NP). Moreover, to assess the relationship between the dose received by the swallowing structures and the dysphagia and xerostomia related quality of life (QoL).

**Materials and Methods:** In the Erasmus MC routinely cancer of the OP is treated with EBRT (external beam Radiation Therapy) to a dose of 46/2 Gy; subsequently it is boosted by either brachytherapy (BT; 20-22 Gy), or (in case BT is not applicable for whatever reason), by frameless stereotactic radiation by means of a Cyberknife (CBK; 3 times 5.5 Gy, dose prescription 80%) or by a boost of intensity-modulated radiation therapy (IMRT; 24/2 Gy). In case of cancer in the NP, after 46/2 Gy the primary cancer in the NP is boosted with parallel-opposed fields or by IMRT to a total dose of 70 Gy; subsequently, a second fractionated boost is given by either BT (T1, T2 tumors, total dose 11 Gy) or by stereotactic radiation (SRT)/CBK (T3, T4 tumors, total dose 11 Gy). All patients receive QoL questionnaires 0, 3, 6, and 12 months after completion of the treatment. For this investigation all patients treated by a Cyberknife as from 2004-2010 were analyzed, that is 36 OP and 19 NP cancers. Most patients responded to the functional- and QoL questionnaires (i.e., the Performance Status Scales, European Organization for Research and Treatment of Cancer H&N35, and M.D. Anderson Dysphagia Inventory). The swallowing muscles were delineated and the mean dose calculated using the original three-dimensional computed tomography-based treatment plans.



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Univariate analyses were performed using logistic regression analysis.

**Results and Conclusions:** At 5-years the LC, DFS, and OS (overall survival) for OP cancers were 82%, 76%, 68%, and for cancer of the NP 70%, 57% and 73%, respectively. The lowest mean doses of radiation to the swallowing muscles were achieved when using BT as opposed to SRT/CBK or IMRT. Most dysphagia problems were observed in tumors originating from the base of tongue. Dysphagia was strongly correlated with Xerostomia. For OP cancer, boosting with IMRT resulted in more dysphagia as opposed to treatment with BT. However, dysphagia problems were encountered in case of treatment with CBK in much the same frequency as in case of treatment with BT. For NPC patients, in contrast to the first booster dose of 24 Gy (46–70 Gy), no additional increase of dysphagia by the second boost was observed. For the 81 patients alive with no evidence of disease for at least 1 year, a dose-effect relationship was observed between the dose in the superior constrictor muscle and the “normalcy of diet” (Performance Status Scales) or “swallowing scale” (H&N35) scores ( $p < 0.01$ ).

## Setting up a biobank for nasopharyngeal carcinoma

Dora Kwong

*Department of Clinical Oncology, The University of Hong Kong, Hong Kong, People's republic of China*

Nasopharyngeal carcinoma (NPC) is an endemic cancer in Hong Kong, Southern China and Southeast Asia. More than 1000 new cases are diagnosed each year in Hong Kong. To promote research in NPC, the Center for NPC Cancer Research (CNPCR) is established in 2008 by a group of scientists and clinicians from universities and oncology centres in Hong Kong. The CNPCR is a collaborative research center focused on studying the etiology and developing innovative methods for early detection and personalized treatment of nasopharyngeal carcinoma. The CNPCR BioBank is a centralized laboratory which contains many types of biological specimens for research on nasopharyngeal carcinoma. Types of biological specimens collected include tumor, lymph node and nasopharyngeal mucosa obtained from endoscopic biopsy or surgery, nasal swabs, blood and body fluid. The CNPCR BioBank was established to prospectively collect biological specimens to support translational research on nasopharyngeal carcinoma. At present, research is focused on

finding novel biomarkers which may help in early diagnosis, predicting prognosis or response to treatment.

## Multi-disciplinary care: Meeting the challenges to improve patient outcomes

David Wiesenfeld

*Head and Neck Oncology Tumour Stream, The Royal Melbourne Hospital, The University of Melbourne, Melbourne, Victoria, Australia*

Multi-disciplinary cancer care presents challenges at many levels, for patients, clinicians, and hospitals. Recognising the challenges and finding solutions at a local level is essential. Patients need to understand the benefits of multi-disciplinary care to fully participate. Long multi-disciplinary clinic (MDC) visits can be confronting unless patients are fully briefed by their referring practitioner. The additional visits for radiology, pre-anaesthetic clinics, biopsies and speech and nutrition clinics, can be tiring especially for the elderly. Clinicians face challenges; they must learn to respect their colleagues, particularly of competing specialties. A mature professional approach, acknowledging each other's clinical skills is essential for a successful MDC. Accepting the benefits of the MDC for the patient enables clinicians to relinquish some of their professional independence and a sense of loss of control. For a successful outcome hospitals must commit additional human and physical resources to the MDC process. Participants in MDCs must have salaries or sessions allocated. At The Royal Melbourne Hospital we regularly have up to 40 participants, including medical practitioners, dentists, allied health practitioners, nurses, supportive care staff, data managers, trainees and students. Our IT utilisation is high, and we have 6 dedicated clinic rooms and meeting spaces. Successful multidisciplinary care is demanding of all participants, however demonstrating improved clinical outcomes justifies the effort.

## MRI of the head and neck for detection of nasopharyngeal carcinoma

Ann King

*Department of Diagnostic Radiology, The Chinese University of Hong Kong, Hong Kong, People's Republic of China*

The presentation will review two MRI techniques for treatment monitoring in HNSCC. Diffusion weighted imaging (DWI). As tumour cells die the ADC value



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of a cancer rises (increase in water diffusion). Following (chemo)radiotherapy significantly lower ADC values are found in residual cancers compared to benign post-treatment masses. In addition during treatment cancers with a lower percentage rise in ADC in the first few weeks, or with an initial rise in ADC followed by a fall in ADC (repopulation of cancer cells) have a significantly greater rate of locoregional failure. T2-weighted imaging. At the primary site 6 weeks post treatment a flat/retracted mass of low T2 signal intensity scar tissue has a high rate of local control, while a focal expansile mass  $\geq 1$ cm of similar T2 signal to the untreated tumour has a high rate of local failure. Regular imaging surveillance identifies local failure in indeterminate masses with mixed appearance, as well as marginal tumour recurrence in patients without any focal mass on the post treatment scan.

## **PET-CT in nasopharyngeal cancer: Bang for the buck or barking up the wrong tree**

Khai Mun Lee

*Division of Plastic, Reconstructive and Aesthetic Surgery, Department of Surgery, National University Hospital, Singapore*

The use of 18F-FDG PET CT for molecular-imaging is now an integral part of the diagnosis, assessment and treatment for various cancers, eg head & neck, lung, cervical cancers and lymphomas. In the management of nasopharyngeal cancer (NPC), the role of 18F-FDG PET CT has been the subject of much clinical and research interest for tumour delineation in relation to normal anatomy for T-staging and radiotherapy-planning as well as assessment for metastases to lymph nodes and distant organs. Often used only as a supplementary modality where a clinical dilemma remains unresolved after conventional evaluation, the use of 18F-FDG PET-CT can perhaps be selectively optimized for maximal benefit to NPC patients. A review of the available evidence will be summarized with regards to the usefulness and limitations of 18F-FDG PET-CT in its various roles for NPC in TNM-staging, treatment-planning and response and relapse assessments so as to better appropriate its cost-effectiveness in clinical practice.

## **Challenges in contemporary NPC treatment**

Jiade Lu

*Department of Radiation Oncology, National University Cancer Institute, Singapore*

Nasopharyngeal carcinoma is uncommon worldwide, but poses a significant public health burden in endemic regions. Primary treatment for non-metastatic disease is by radiation therapy, which has evolved from simple 2D-planning techniques to intensity-modulated radiation therapy. The role of systemic therapy has also become more prominent, with concurrent cisplatin-based chemoradiation the current standard of care for locally advanced disease based on multiple Phase III studies. Based on these advances, the prognosis of nasopharyngeal carcinoma appears to have improved significantly over the past two decades. Nevertheless, there are areas of substantial uncertainty and divergent views in the optimal treatment strategy. Distant metastases have become the dominant mode of treatment failure with the excellent local control provided by intensity-modulated radiation therapy. Recent studies have focused on this challenge of treating micrometastases while keeping toxicities manageable. Radiation therapy techniques continue to be refined to maintain consistently high locoregional tumor control while decreasing the probability of acute and late toxicities. This talk discusses some of the current issues confronting the multidisciplinary team managing this disease.

## **Novel molecules in NPC treatment**

Boon Cher Goh

*Department of Hematology-Oncology, National University Health System, Singapore*

There has been significant improvement of treatment for locally advanced undifferentiated NPC with concurrent chemoradiotherapy, but many patients still relapse with distant metastases. For this reason, there has been interest to develop new therapeutics for NPC. Unfortunately, there are no suitable animal models to study EBV related NPC, and the cell lines available may not be representative of the molecular biology of de novo NPC. Nonetheless, several aspects of the molecular biology of NPC have allowed inroads into development of potentially active therapies. Epidermal growth factor receptor is highly expressed in NPC, and cetuximab in combination with chemotherapy has been studied, with modest



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success. Vascular endothelial growth factor receptor is also highly expressed in NPC, and anti VEGFR treatment has been studied in NPC in a recently concluded phase II study of pazopanib. Beyond these receptor tyrosine kinase receptors, other aberrant pathways have been identified in NPC, including cell cycle regulation and anti-apoptosis, which may open up possible directions for drug development.

## **Optimizing the radiotherapeutic management of oropharynx carcinoma**

James Bonner

*The University of Alabama at Birmingham, USA*

Primary radiotherapy has long been a cornerstone of effective treatment for locoregionally advanced oropharynx cancer (Kramer et al, *Head Neck Surg*, 10(1):19-30, 1987). During the last 25 years, investigations have explored methods of optimizing radiation fractionation and the integration of radiation and chemotherapy. Altered fractionated radiotherapy and chemoradiotherapy are two approaches that have demonstrated locoregional control or survival advantages compared to conventionally fractionated radiotherapy alone. However, it is not known whether altered fractionation is necessary when chemoradiotherapy is employed. We have explored the experience at The University of Alabama at Birmingham (UAB) during the period of 1995 – 2007. We found that an average weekly radiation dose (AWD) of <10 Gy resulted in decreased locoregional control compared to an AWD >10 Gy for patients treated with radiotherapy alone. However, when patients received chemoradiotherapy, there was no difference in locoregional control for patients treated with an AWD of <10Gy compared to an AWD of >10 Gy (Dragovic et al, *Head Neck*, December 9, 2010 - Epub ahead of print). Additionally, randomized studies have thus suggested that altered fractionated radiotherapy does not improve upon the results of conventionally fractionated radiotherapy when chemotherapy is utilized. It remains a question whether chemotherapy can be avoided in certain cases when altered fractionated radiotherapy is utilized. Radiotherapy techniques have evolved substantially over the last 25 years. Intensity modulated radiation therapy (IMRT) is commonly utilized whether patients are receiving radiotherapy alone or chemoradiotherapy. IMRT has allowed physicians to avoid high doses to critical normal structures and maximize the dose to the tumor. Post radiation dysphagia is particularly

problematic in patients with oropharynx cancer, as the tumors have often caused damage to the normal structures involved in swallowing. We and others have examined the relationship of various radiation doses delivered to the pharyngeal restricted muscles and long-term dysphagia. We found that the patients experienced increased PEG tube dependency when the mean dose to the larynx exceeded 41 Gy or when the V60 of the inferior pharyngeal constrictor exceeded 12% (Caudell et al, *Int J Rad Oncol Biol Phys*, 76(2):403-409, 2010). Finally, the increasing role of human papilloma virus (HPV) in the pathogenesis of oropharynx cancer has resulted in the understanding that HPV – related oropharynx cancers show a much improved response and patient survival compared to tumors that are not HPV – related. This realization has led to new trials that are directed toward decreasing the intensity of treatments for HPV – related tumors in an effort to reduce toxicity.

## **Workhorse flap – anterolateral thigh flap in the head and neck soft tissue reconstruction**

Fu-Chan Wei

*Department of Plastic Surgery, Chang Gung Memorial Hospital Chang Gung University, College of Medicine, Taipei, Taiwan*

The cutaneous flap has evolved from direct or septocutaneous vessel based to perforator based ones in recent years. Anterolateral thigh flap is the most commonly used perforator flap, widely applied to various soft tissue or coverage defect reconstruction, especially in the head and neck. It has many advantages including long pedicle with suitable vessel diameter, large amount of skin and adjustable thickness, possible inclusion of multiple tissue components, possible innervation, and lower donor site morbidity. Furthermore, it allows two-team work in most cases. This presentation shall cover the anatomy, and the technique of harvesting the flap, how to prevent complications, and possible clinical applications.

## **Post-treatment dysphagia - its measure and prevention**

June Corry

*Peter MacCallum Cancer Centre, Melbourne, Victoria, Australia*

Chemoradiation has been the treatment of choice for locally advanced oropharyngeal cancer at our centre, and indeed many centres worldwide, for



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over a decade. The loco-regional control rates are high and functional outcomes have been believed to be better than with surgery and post operative radiotherapy. Nevertheless it must be said that documentation of functional outcomes in head and neck cancer patients has been poor, even in prospective studies. It is time that all prospective studies and indeed routine clinical follow-up incorporate functional outcome assessment as standard practice. Accurate measure of a problem is vital for understanding mechanisms in its production and thus facilitating prevention. A comparison of tools for documenting dysphagia and speech will be presented, as well as data demonstrating how IMRT can reduce post treatment dysphagia.

## Utility of the re-staging PET scan in N+ HPV+ HNSCC patients

Sandro V Porceddu

*Princess Alexandra Hospital, Brisbane, Queensland, Australia*

We have recently published the results of a study testing the utility of PET-guided management of the neck following definitive chemoradiotherapy in node positive mucosal head and neck squamous cell carcinoma. This study demonstrated that regardless of any residual structural nodal abnormality a neck dissection could safely be omitted in patients who achieved a complete response at the primary site and the 12-week post-therapy PET was negative in the neck. Recent studies have now confirmed the favourable prognostic significance of HPV positive tumours following definitive therapy. Since our publication we have continued to prospectively collect data on all patients treated according to the PET-guided management of the neck protocol. This presentation will provide a report on the HPV status and outcomes of the entire group, inclusive of the extended cohort.

## Imaging of lymph nodes in head and neck cancers

Teo Tze Hern

*National Cancer Centre, Singapore*

Cervical nodal involvement in Head and Neck cancers is a major prognostic determinant as well as the strongest prognosticator for nodal recurrence as well as development of distant metastasis. Cross sectional imaging like CT and MRI are modalities of choice for assessment for presence of nodal

involvement. Radiological size or changes in nodal morphology remains the main criterion for determining nodal involvement. Use of other modalities such as PET or functional MRI methods such as diffusion weighted imaging (DWI) have been used as adjuncts for borderline sized lymph nodes.

## TORS: Early outcomes data

Suren Krishnan

*Department of Otolaryngology, Head and Neck Surgery, Royal Adelaide Hospital, Adelaide, South Australia, Australia*

Transoral robotic resection is a relatively new technique in the management of malignant and benign lesions in the head and neck. The technique was developed in 2001 at the Hospital of the University of Pennsylvania in Pittsburgh by Gregory Weinstein and Bert O'Malley; and the original work in a canine model was performed by Neil Hockstein. The Royal Adelaide Hospital commenced transoral robotic surgery in 2008 and has a two year experience in a variety of tumour resections. 80 cases have undergone transoral robotic resection, approximately 50 of these were resections for head and neck malignancy. 44 of these procedures were for oropharyngeal malignancies. We have also performed three supraglottic laryngectomies, two vertical partial laryngectomies and one TORS assisted total laryngectomy. The data to be presented at the meeting shows that our experience with trans oral robotic surgery for oropharyngeal cancer is similar to the results reported by other units performing this surgical technique from the Mayo Clinic in the Hospital University of Pennsylvania and is comparable to results of treatment of oropharyngeal cancer with non surgical organ preservation regimes. Our early evidence suggests a reduction in morbidity, particularly late onset dysphagia and osteoradio necrosis.

## Facial reanimation – principles, strategies, technical refinements and outcome

Swee T Tan<sup>1-3</sup>, Sydney Ch'ng<sup>2</sup>, Craig A MacKinnon<sup>2</sup>, Charles Davis<sup>2</sup>, David W Glasson<sup>2</sup>

*1Gillies McIndoe Research Institute; 2Head & Neck / Skull Base Programme, Wellington Regional Plastic, Maxillofacial & Burns Unit, Hutt Hospital; and 3University of Otago, Wellington, New Zealand*

**Objective:** Facial paralysis profoundly affects the quality of life (QoL) particularly in patients



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undergoing treatment for head and neck cancer. A plethora of techniques are available for facial reanimation but there is accepted algorithm. We present our experience with facial reanimation to highlight the philosophy, principles, and technical refinements.

**Methods:** Patients were culled from our Head and Neck database. Facial paralysis is divided into upper, middle and lower thirds. The facial reanimation techniques used were tailored to the deformity, and were chosen within the overall clinical context e.g., cancer versus congenital anomaly. Generally for cancer patients, gold weight and lateral tarsorrhaphy were used for eye protection and brow lift for brow ptosis, temporalis muscle transfer with tensor fascia lata graft for reanimation of the midface, and digastric transfer for the paralysed lower lip. Contralateral digastric and myelohyoid transfers were used in the absence of the ipsilateral digastric. In young cancer patients, a combination of nerve grafting to the zygomatic and frontal branches, insertion of gold weight, temporalis and digastric transfers avoided synkinesis. Cross facial nerve graft and free muscle transfer were generally reserved for congenital cases. The patients were assessed for spontaneity, resting and forced voluntary symmetry, and synkinesis with a modified Sunnybrook grading system based on photos and video recording. The patients also completed the previously validated Facial Clinimetric Evaluation questionnaire based on 6 domains: facial movement, facial comfort, oral function, eye comfort, lacrimal comfort and social function.

**Results:** 72 patients, aged 11-88 years, underwent facial reanimation following ablative cancer surgery (n=54), recurrent pleomorphic adenoma (n=3), acoustic neuroma (n=6), congenital facial palsy (n=4), trauma (n=3), and unresolved Bell's palsy (n=2). 10 of these patients were referred from other services for delayed reanimation following tumour ablation. 25 patients required reanimation of the entire hemiface, and the remainder lesser degrees of reanimation. The upper third proves to be surgically most challenging. Forced voluntary movements were average whereas spontaneous movements were good on clinical assessment. Patients rated their clinical outcomes highly.

**Conclusion:** Facial reanimation requires a thorough understanding of the principles and techniques for optimal outcome. Patients rated their clinical outcomes highly. Immediate facial reanimation should be part of the overall treatment

to preserve or improve QoL in head and neck cancer patients.

## Ocular rehabilitation in periorbital reconstruction

Wing-Yung Cheung

*Division of Plastic and Head & Neck Surgery, Kwong Wah Hospital, HKSAR, People's Republic of China*

A total exenteration defect often produces significant physical, psychological and social problems. Indications for exenteration include tumor ablation, trauma, and orbital sepsis. Patients who request ocular rehabilitation using ocular prosthesis require well-planned periorbital reconstructions to accommodate the ocular prosthesis. Firstly, vascularized flaps are needed to help restore the bony and soft tissue defects. Secondly, a stable pocket with a sturdy lower eyelid is reconstructed to prevent prosthesis displacement. Canthopexy, fascial sling to upper eyelid, and dermo-fat graft are often used to achieve symmetry. Multi-staged procedures are planned over one to two years and patients' dedication and trust is of utmost importance.

## Osteoradionecrosis

Richard Lewis

*Royal Perth Hospital, Perth, Western Australia, Australia*

Osteoradionecrosis occurs in 5-15% of patients treated with radiotherapy to the oral cavity. Initially thought to be caused by infection, it has been accepted since 1980 that it was caused by hypoxia and microvascular obliteration. More recently, a fibroatrophic theory has been proposed, leading to treatment with antioxidants and free radical scavengers, rather than the traditional hyperbaric oxygen. The evidence for and against these theories will be discussed, along with results of these treatments.



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## Surviving survivorship: the challenge of late onset dysphagia

*1Cancer Care Centre, St George Hospital;  
2Department of Gastroenterology, St George Hospital, Sydney, New South Wales; 3School of Human Communication Sciences, La Trobe University, Melbourne, Victoria, Australia*

Over the past 20 years, Head and Neck cancer (HNC) mortality rates in New South Wales, Australia have improved by 23% (from 9.5 to 7.2% deaths per 100,000 per annum). This has, however, occurred against an increase in morbidity. One such serious morbidity of treatment is dysphagia (swallowing dysfunction). Although well documented during the acute phase of HNC treatment, dysphagia has unfortunately been under-reported and managed as a late treatment effect. We know that changes to swallowing function are common in HNC patients and that it may have a negative effect on people 'surviving well.' In our recent review of patients from 2-8 years following multi-modal treatment for HNC, 64% of patients (n=80) reported dysphagia. Further, in a recent cohort study of laryngectomy patients in Australia, 72% of survivors (n=120) reported having a marked swallowing dysfunction (Maclean, Cotton & Perry, 2009) so this is clearly a common problem, regardless of which mode of HNC treatment is chosen. The long-term management of dysphagia in HNC patients is challenging for clinicians as it often presents after cancer surveillance has been completed. Additionally, treatment options for dysphagia due to fibrosis are limited. To better understand and manage dysphagia following HNC and its treatment, clinicians need to prospectively audit late(r) phases of survivorship, not just the acute phase. Additionally, HNC survivors themselves need to be alerted to likely late toxicities and be encouraged to request an early referral for assessment and management of any late onset swallowing dysfunction. In this paper, we suggest a proactive approach to dysphagia management in the later phases of cancer rehabilitation which, if implemented, may have a positive impact on the well-being of HNC survivors.

## Integrating the dietitian into the head and neck MDT

Paul Rigby<sup>1</sup>, Shirley James<sup>2</sup>

*1Nutrition and Dietetic Service; 2Speech Language Therapy, Hutt Hospital, Lower Hutt, New Zealand*

**Objectives:** Prior to 2010, post treatment head and neck cancer patients residing in the Hutt Valley District Health Board (HVDHB) catchment received follow up care from a Community Dietitian and the Plastic Surgery Service Speech and Language Therapist (SLT) at separate appointments. This arrangement resulted in several issues, including patients attending two separate appointments to receive advice on a similar topic and delays in dietetic review if the Community Dietitians were busy. A joint Dietetic/SLT clinic was established to ameliorate these issues.

**Methods:** From March 2010, the Plastic Surgery Service Dietitian and SLT accepted referrals for HVDHB patients with oral, pharyngeal or laryngeal cancer treated by one Radiation Oncologist. Patients were jointly seen in the Therapies Department at Hutt Hospital.

**Results:** Between March 2010 and August 2011, 14 HVDHB patients post radiotherapy for oral, pharyngeal or laryngeal cancer have been seen in the joint Dietetic/SLT clinic. Patients were initially seen approximately four weeks following completion of radiotherapy, with follow up (range 0-9 times) as needed.

**Conclusions:** The joint Dietetic/SLT Clinic has resulted in several benefits to post treatment oral, pharyngeal and laryngeal cancer patients residing in the Hutt Valley, including a reduction in the number of health professional appointments to attend and more frequent follow up for those that need it. Additionally, the assumption of care for these patients through this initiative has aided the integration of the Plastic Surgery Dietitian into the wider Head and Neck Multidisciplinary Team.



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## The role of nutrition support in head and neck cancer patients - a Singapore perspective

Cheryl My Au

*National University Hospital, Singapore*

Nasopharyngeal cancer (NPC) is a common occurring cancer in Asia. NPC patients are at risk of malnutrition associated with acute and late toxicity effects of treatment. In Singapore, the National University Hospital (NUH) uses a validated 3-Minute Nutrition Screening (3-MinNS) tool to identify patients at risk of malnutrition. Early nutrition intervention for patients undergoing treatment evidently leads to positive nutrition-related outcomes such as weight maintenance, improvements in nutritional status and quality of life. In NUH, dietetic consultations are provided every fortnightly or weekly for 6 weeks during radiotherapy treatment in outpatient clinics and patients are followed up after treatment. Unintended weight loss is common in this group of patients as they face feeding challenges due to the side effects of treatment as well as having increased nutritional requirements. Food aversions commonly lead to nutrient deficits, leading to weight loss. Importantly, weight maintenance in this population leads to beneficial outcomes and may be a more appropriate aim of nutrition support during radiotherapy. It is recommended that all patients identified as being malnourished or at risk of malnutrition receive early and ongoing nutrition intervention by a dietitian to help maintain nutrient intakes, during and after radiotherapy treatment.

## Physiotherapy for accessory nerve shoulder dysfunction following neck dissection surgery: a multicentre randomized controlled study

Aoife McGarvey<sup>1</sup> Pauline E Chiarelli<sup>2</sup>, Peter G Osmotherly<sup>2</sup>, Gary R Hoffman<sup>3</sup>

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**Purpose:** To explore early screening and referral to progressive resisted exercise stabilisation training (PREST) physiotherapy versus usual care if accessory nerve shoulder dysfunction (ANSF) is present following neck dissection.

**Methods:** Prospective, multicentre randomised controlled single blinded study. Intervention group

receive supervised pathology specific exercise for twelve weeks. Control group receive a brochure of generalised shoulder home based exercises. Blinded assessors obtain outcome measures at baseline, three, six and twelve months. Measures include shoulder motion, SPADI (a pain and functional measure) and NDII (a quality of life measure).

**Results:** Interim results of 37 participants at three and six months will be presented.

**Declaration:** Aoife McGarvey is supported by the James Lawrie Research Grant awarded in 2009 by the Calvary Mater Newcastle Hospital, and by the Barker Scholarship awarded in 2011 by HMRI. This contribution is free from any conflict of interest.

## Post-operative management of well differentiated thyroid cancers

Sin-Ming Chow

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There is an increasing incidence of thyroid cancer (particularly papillary type) in some countries. The management of thyroid cancer is becoming structuralized. Apart from the mainstay surgery, I-131 and external radiation therapy is well-recognized effective alternatives/partners in treatment. I-131 ablation decreased locoregional and distant relapses. The indications are well defined in advanced well-differentiated thyroid cancers. For patients with low risks, it is still controversial. External radiation therapy has tremendous improvement to employ 3-D planning and delivery of x-rays to conform to the target volume. In locally or regionally advanced cases, it improves the neck control.

## Neck dissection for thyroid cancer

Christopher Goh

*Department of Otolaryngology, Singapore General Hospital, Singapore*

The management of the neck for thyroid cancers can be controversial and there are no randomized controlled trials to date which has addressed these issues. What is well established is the fact that occult nodal metastases is common in the central as well as lateral compartments of the neck for papillary and medullary thyroid cancers. The



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presence of cervical nodal metastasis in papillary thyroid cancer does not seem to have any major impact on prognosis although there are published reports which suggest that they may have prognostic significance in elderly patients and those with bulky nodal disease. In addition, central compartment neck dissection has been associated with an increased risk of post-operative hypocalcemia and permanent hypoparathyroidism. As such, the benefit of an elective central compartment neck dissection has to be weighed against the potential risk of the surgery. Although the risk of occult lateral cervical nodal metastases from papillary thyroid is significant, it is widely accepted that an elective lateral neck dissection is not recommended. It is also well recognized that the recommendation for those with positive nodes in the lateral neck is for selective neck dissection with removal of levels II, III, IV and V as the incidence of nodal metastases to level I is quite uncommon. Finally, unlike squamous cell carcinomas, it is worthwhile considering mediastinal nodal dissection for those with mediastinal nodal metastases from papillary thyroid carcinoma as it is still possible to achieve cure for this group of patients.

## Collaborative research on Merkel cell carcinoma of the skin in Australia

Michael Poulsen

*Radiation Oncology Mater Centre, South Brisbane, Queensland, Australia*

Merkel cell carcinoma (MCC) of the skin is a rare, aggressive skin cancer of neuroendocrine origin which occurs in sun exposed areas of the skin, predominately in the older population. Research into MCC from 1980-2000 was confined to retrospective studies which helped define the aggressive behaviour and also demonstrated the additional benefit of adjuvant radiotherapy. The QIMR developed cell lines for MCC and demonstrated the chemo sensitivity of MCC in culture. In 2006, the QLD Cancer Control Analysis team collected data on all public patients diagnosed with MCC in QLD during the years of 2000-2006. The 5 year overall survival for the 112 patients included was 53% and the loco-regional control rate was 70%. The benefits of doses of radiation larger than 50Gy were demonstrated in this study. There was no adverse impact to the presence of positive margins relapses at the primary site. The TROG 96.07 study was a phase II study which prospectively collected survival, loco-regional control and toxicity data on high risk MCC treated

with chemoradiotherapy. The protocol was deliverable in a multi-institutional setting with 76% 3-year survival. This protocol has subsequently been modified in TROG 09.03 which also incorporates PET imaging into the protocol. In conclusion, there has been a substantial amount of research into MCC and prospective multi-institutional studies are required to further refine the available treatment modalities in order to achieve the optimal outcomes in terms of survival and toxicity.

## Large nerve perineural spread of cutaneous malignancy

Ben Panizza

*Princess Alexandra Hospital, Brisbane, Queensland, Australia*

**Objective:** To describe the pathological and clinical features of large nerve perineural spread of cutaneous malignancy and its implications to management with results.

**Methods:** A prospectively collected database of over 100 cases with radiological and pathological data. Small nerve perineural, direct spread and external compression of nerves by bulky tumour have been excluded. **Results:** This disease process is poorly understood with the diagnosis often significantly delayed by many different specialists. The natural history of the disease is central spread with failure in the brain. Tumour spreads in a continuous fashion with no identified skip lesions (nil of 81 nerves assessed from 60 patients). The epi- and perineurium are excellent barriers to spread and almost always contain the tumour a short distance from the skin. MR neurography specifically designed to look at large nerves should detect large nerve spread in almost all cases with an 83% accuracy in determining the extent of spread (25 patients/30 nerves). A properly designed skull base operation to remove resectable disease with post-operative radiation if possible should give 5 yr DFS=61% and OS=73% (n=39)

**Conclusion:** Large nerve spread is poorly understood. With a better understanding of the process, earlier detection and treatment based on targeted MR neurography with a properly designed operation and focused radiotherapy should lead to improved treatment outcomes.



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## Surgery for anterior skull base tumours in 2011

Bernie Lyons

*Department of ENT Head and Neck Surgery / Skull Base Surgery, St. Vincent's Hospital Melbourne, Victoria, Australia*

Malignant tumours of the upper sinonasal vault are rare and necessitate specialized surgical skills for their resection. We present the 18-year experience of Melbourne's St Vincent's Hospital in treating sinonasal tumours via the open craniofacial approach and provide a review of the current literature concerning management of anterior skull base tumours including the trend towards Endoscopic Approaches. A retrospective chart review was conducted on patients who were treated at this hospital between 1992 and 2010, via an open craniofacial resection (CFR) for sinonasal vault neoplasms. 109 patients' data was collected, identifying patient demographics, tumour pathology and T staging, primary treatment modality, post-operative complications, adjuvant treatments applied and their long-term follow-up. Of the 109 patients, the average patient was male (83%) with an average age of 62 years (range 21-85 years). The majority had ethmoid sinus tumours and the spectrum of tumours included adenocarcinoma (51%), squamous cell carcinoma (12%), olfactory neuroblastoma (12%) and melanoma (7%). The commonest pT- staging was 3+. Major complications occurred in patients 24 (22%). A subset of patients underwent adjuvant therapy; chemo-radiotherapy in 15% and radiotherapy alone in 60%. The 5-year overall survival was 61%, the 5-year disease specific survival was 76% and the 5-year recurrence free survival was 79%. Open CFR has an acceptable 5-year overall, disease specific and recurrence free survival rates. Tumour characteristics that favour recurrence are bone, dural and brain infiltration, orbital involvement and adverse histological type such as melanoma. CFR remains the gold standard for treatment of sinonasal tumours however we believe there are indications for the adoption of endoscopic approaches but that these decisions need to be made in the setting of a multidisciplinary head and neck team and outcomes closely monitored.

## Oncologic intergrity in endoscopic resection of sinonasal and skull base malignancies

Prepageran Narayanan

*Department of Otorhinolaryngology, University Malaya, Kuala Lumpur, Malaysia*

Endoscopic excision of sinonasal malignancies has recently been advocated for certain cases with good results. The principle is to maintain a total excision with clear margins regardless of a open or endoscopic excision still holds true. This presentation highlights a series of sinonasal malignancies that were excised endoscopically. Imaging modalities and the steps of the surgery is illustrated in video clips and include a wide range of different sinonasal pathology. Follow up videos and images are also highlighted in certain cases.

## Radiotherapy for skullbase tumours

Robert Smee

*Department of Radiation Oncology, The Prince of Wales Cancer Centre; Australia Clinical Teaching School, University of New South Wales, Sydney, New South Wales, Australia*

The title defines tumours that take origin below, within, or above the skull base, benign or malignant. There are many tumours that will cross from one zone to another, benign or malignant (glomus jugulare meningiomas to nasopharyngeal carcinomas, perineural infiltration). Thus any treatment approach has to address the potential for this extent of spread, respective of adjacent normal tissues. A beginning to the treatment selection process is the operability of the tumour, benign or malignant. Partial resection, unless it is to reduce pressure features, infrequently improves the ultimate outcome. Radiotherapy is a means to address this circumstance, with increasingly sophisticated methods of delivery enabling, where appropriate, dose escalation. Multi-modality assessment is the preferred way to address the treatment approach.



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## **QOL considerations and evidence-based management of the NO neck**

William Wei

*Department of Surgery, The University of Hong Kong, Hong Kong, People's Republic of China*

The management of N0 neck depends on the type and extent of the primary tumour. This also determines the levels of neck lymph node that should be removed and unilaterally or bilaterally. The extent of neck dissection has evolved from radical neck dissection through modified neck dissection to selective neck dissection (SND), aiming to remove only those nodes considered to have risk of harbouring metastasis. In general, for intraoral lesions with N0 neck, lymph nodes in levels I, II and III are removed and for large laryngeal or hypopharyngeal tumours with N0 neck, lymph nodes in levels II, III and IV are cleared. When the primary tumour crosses the midline, then bilateral neck nodes are removed. Even with SND there are associated morbidities such as the aesthetic appearance of neck, numbness around the wound and more importantly the shoulder dysfunction related to spinal accessory nerve. Quality of life does not equate to morbidity, it is however influenced by many other factors, such as extent of resection of the primary tumour and adjuvant chemoradiation. When the accessory nerve was removed during neck dissection, the scores recorded from quality of life questionnaires were lower. Some recent studies have shown that in patients with squamous cell carcinoma of the head and neck with N0 neck, metastasis rarely occurs in level IIB. These studies support a super-selective neck dissection that reduces operating time and the shoulder dysfunction, as the accessory nerve is not dissected; while removing all the high risk tumour-bearing lymph nodes.

## **Hypoxic modification of radiotherapy in head and neck cancer – adored and ignored**

Jens Overgaard

*Department of Experimental Clinical Oncology, Aarhus University Hospital, Denmark*

Since observations from the beginning of the last century, it has become well established that solid tumors may contain oxygen deficient hypoxic areas and that cells in such areas may cause tumors become radioresistant. Numerous clinical trials modifying the hypoxic radioresistance in squamous cell carcinoma of the head and neck (HNSCC) have

been conducted, but most have been inconclusive, partly due to a small number of patients in the individual trial. A meta-analysis was therefore performed utilizing the results from all clinical trials addressing the specific question of hypoxic modification in HNSCC undergoing curative intended primary radiotherapy alone. A systematic review of published and unpublished data identified 4805 patients with HNSCC treated in 32 randomized clinical trials. Overall hypoxic modification of radiotherapy in head and neck cancer did result in a significant improved therapeutic benefit. This was most dominantly observed when using the direct endpoint of loco-regional control with an odds ratio (OR) of 0.71, 95% cf.I. 0.63- 0.80;  $p < 0.001$ ), but this was almost mirrored in the disease specific survival (OR: 0.73, 95% cf.I. 0.64-0.82;  $p < 0.001$ ), and to a lesser extent in the overall survival (OR: 0.87, 95% cf.I. 0.77-0.98;  $p = 0.03$ ). The improvement in loco-regional control was found to be independent of the type of hypoxic modification. The trials have used different fractionation schedules, including large doses per fraction, which may result in relative more hypoxia and a greater benefit. However, analysis of HNSCC trials using conventional fractionation only, showed that the significant effect of hypoxic modification was maintained. The meta-analysis thus demonstrate that there is level 1a evidence in favour of adding hypoxic modification to radiotherapy of squamous cell carcinomas of the head and neck. However, not all HNSCC contain relevant hypoxia. There are suggestions that HPV-positive tumors may have limited benefit of hypoxic modification. Furthermore, a gene-profile has recently been developed based on extractions from routine paraffin embedded biopsies. This profile together with knowledge of the HPV-status strongly predict for the therapeutic benefit of hypoxic modification with the sensitizer Nimorazole. Thus after 100 years of research in hypoxia do we finally have the tool to identify and overcome hypoxic radioresistance in HNSCC.

## **Brachytherapy in treating recurrent neck disease**

Roger Ngan

*Department of Clinical Oncology, Queen Elizabeth Hospital, Kowloon, Hong Kong, People's Republic of China*

Neck failure after radiotherapy for NPC is commonly treated by neck dissection, which can confer a 5-year neck control of 50% - 60%. Advanced neck



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recurrence is frequently associated with either evidence of fixation to underlying tissue and/or carotid artery encroachment preoperatively, and possible residual disease, extra-capsular spread, and positive/close resection margins postoperatively, all of which will predispose to further neck failure. Peri-operative brachytherapy conceptually provides an opportunity to deliver an early, intensive dose of radiation to the microscopic residual tumor around the tumor bed and spare the adjacent tissues through the inverse square law, a pertinent advantage as a form of 'internal' re-irradiation. Though rare, major complications like carotid blowout, wound healing problems, and neck fibrosis can occur, but can largely be prevented by judicious use of musculo-cutaneous flaps. The combined approach of neck dissection and peri-operative brachytherapy has been employed in our Institution for 20 years, and favorable results have been observed for patients with advanced neck failure as defined above who would have otherwise been deemed unresectable for cure. Local neck control achieved was found similar to that obtained in patients with more resectable neck failures. While these results were largely derived from the use of Iridium-192 wires manually after-loaded into the catheters inserted in the neck during neck dissection to deliver continuous low dose rate brachytherapy over a few days within the first postoperative week, fractionated high dose rate brachytherapy is now being employed through a highly active Iridium-192 source from a commercially available afterloader.

## Re-irradiation for recurrent nasopharyngeal carcinoma: Past, present and future

Daniel Chua

*Comprehensive Oncology Centre, Hong Kong Sanatorium & Hospital, Hong Kong, People's Republic of China*

Improved radiotherapy technique, accurate target delineation based on MR and PET-CT findings, and concurrent chemo- radiotherapy have all contributed to the improved local control rate of nasopharyngeal carcinoma (NPC). Local recurrence however remains an important cause of morbidity and mortality especially in patients with advanced T stage disease. Aggressive salvage treatment is generally recommended since long-term control can still be achieved in a significant proportion of patients. In patients with disease confined to the nasopharynx, nasopharyngectomy can achieve a long term control rate of 67% whereas

brachytherapy using gold grain implantation can also achieve a long term control rate of 52-72%. Stereotactic radiotherapy using single or multiple fractions have also been employed in treatment of local failures of NPC with long term control of 53-86%. Patients with more extensive or bulky disease however required external beam re-irradiation which is technically challenging. The reported five-year survival rates after external beam re-irradiation using conventional technique ranged from 8% to 36%, with a high incidence of late complication. The use of intensity-modulated radiotherapy in re-irradiation of NPC allows better sparing of normal tissues while delivering high dose to the target. Preliminary reports using IMRT for re-irradiation of NPC showed good short-term control with a relatively low incidence of severe late toxicities. Molecular characterization of recurrent tumor may assist clinician in selecting optimal treatment strategy in retreatment of NPC. Charged particle therapy has superior physical properties and represents the ideal technique for external beam re-irradiation of NPC but access to this technique is limited in most endemic regions.

## MRI of the head and neck post (chemo) radiotherapy for tumor recurrence and surveillance imaging

Ann King

*Department of Diagnostic Radiology, The Chinese University of Hong Kong, Hong Kong, People's Republic of China*

The presentation will review two MRI techniques for treatment monitoring in HNSCC. Diffusion weighted imaging (DWI). As tumour cells die the ADC value of a cancer rises (increase in water diffusion). Following (chemo)radiotherapy significantly lower ADC values are found in residual cancers compared to benign post-treatment masses. In addition during treatment cancers with a lower percentage rise in ADC in the first few weeks, or with an initial rise in ADC followed by a fall in ADC (repopulation of cancer cells) have a significantly greater rate of locoregional failure. T2-weighted imaging. At the primary site 6 weeks post treatment a flat/retracted mass of low T2 signal intensity scar tissue has a high rate of local control, while a focal expansile mass  $\geq 1$ cm of similar T2 signal to the untreated tumour has a high rate of local failure. Regular imaging surveillance identifies local failure in indeterminate masses with mixed appearance, as well as marginal tumour recurrence in patients without any focal mass on the post treatment scan.



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## **Tongue cancer prognostication: Patients, paraffins and pathways**

Gopal Iyer

*National Cancer Centre, Singapore*

Current staging systems provide a basic guide to prognosticating patients with squamous cell carcinoma of the tongue. However, in the current era of individualized therapy together with the ongoing revolution in targeted therapy, this approach may prove to be too simplistic to prognosticate, guide treatment decisions or estimate response to treatment. For patients with early stage cancer, there remains a yet undefined group that develop early tumor recurrence despite optimum conventional treatment. There is a need to identify markers to delineate this poor outcome group. Conversely, in patients with advanced disease, pathway analyses may be an important component of treatment selection, especially with novel therapeutic compounds, which target specific pathways, and hence need to be utilized in a rational manner. This talk summarizes the authors approach in identifying markers to answer these questions specifically in tongue cancer. It includes approaches such as expression microarray analyses, HPV analyses and stem cell identification, and their utility to prognosticate tongue cancer

## **Effective combinations of radiotherapy and systemic agents in the management of locoregionally advanced head and neck cancer**

James Bonner

*The University of Alabama at Birmingham, USA*

During the past 25 years, many studies have explored methods of combining systemic agents with the radiotherapeutic management of locoregionally advanced head and neck cancers. More than 80 randomized trials have been performed and greater than 16,000 patients have been entered onto trials comparing locoregional treatment alone to locoregional treatment with systemic therapy. Meta-analysis of these trials have shown that concomitant chemotherapy and locoregional treatment provides an absolute survival benefit of 4.5% at 5 years compared to locoregional treatment alone (Pignon et al, *Radiother Oncol*, 92:4-14, 2009). The best method of integrating chemotherapy (or other systemic agents) remains the subject of much investigation. An important intergroup study showed an absolute 3 year survival advantage of 14% for head and neck patients with

unresectable locoregionally advanced disease who received 3 cycles of bolus cisplatin during radiotherapeutic management compared to radiotherapy alone (Adelstein et al, *J Clin Oncol*, 21:92-98, 2003). This landmark study had a significant impact on the standard of care for these patients. However, other investigators were examining the use of chemotherapy prior to radiotherapy for these patients (induction chemotherapy). This latter methodology was employed as a means of delivering high dose chemotherapy in a manner that would allow for maximizing the dose of chemotherapy as the dose would not be hindered by toxicities associated with the simultaneous delivery of radiotherapy and chemotherapy. Two landmark studies were published in the *New England Journal of Medicine* in 2007 and both demonstrated that a three-drug induction chemotherapy regimen (followed by radiotherapy) of docetaxel, cisplatin and 5-FU improved survival of patients with locoregionally advanced head and neck cancer, compared to the two-drug induction chemotherapy regimen of cisplatin and 5-FU (Posner et al and Vermorken et al). Therefore, investigations were begun to compare these new induction chemotherapy regimens (followed by radiotherapy) to regimens of concurrent chemoradiotherapy. These trials are ongoing and will be reviewed. At the same time, trials have been initiated to determine the tolerability and efficacy of combining targeted agents with either induction chemotherapy regimens or concurrent chemotherapy regimens.

## **Clinical assessment of AdE1-LMPpoly based adoptive immunotherapy for Epstein-Barr Virus associated nasopharyngeal carcinoma**

Rajiv Khanna<sup>1</sup>, Corey Smith<sup>1</sup>, Leone Beagley<sup>1</sup>, Janice Tsang<sup>2</sup>, Dora Kwong<sup>2</sup>, Daniel Chua<sup>3</sup>, John Nicholls<sup>4</sup>

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Nasopharyngeal carcinoma (NPC) is endemic in China & Southeast Asia. Virtually all NPCs are associated with Epstein-Barr virus (EBV), being an attractive candidate for cellular immunotherapy



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targeted against tumour-associated viral antigen. Specific cytotoxic T-cell (CTL) generated from NPC patients serves as a potentially important target for T cell-based immunotherapy. We have conducted a phase I open-label non-randomized adoptive immunotherapy trial for recurrent and metastatic NPC patients. We aimed to assess the tolerability & safety of adoptive transfer of the latent membrane proteins (LMP)/ EBV nuclear antigen EBNA1-specific CTLs expanded using AdE1-LMPpoly vector and to explore any clinical benefit of such therapy. During January 2008 to Aug 2010, we recruited recurrent or metastatic NPC patients for adoptive immunotherapy after informed consent. Patients with successful autologous T-cell expansion were administered with CTL every 2-weekly up to a maximum of 6 doses. Bloods including EBV DNA and CT imaging were performed at baseline and at regular intervals. Altogether 24 patients were recruited with 1 withdrawal (22 males, 2 females), mean age being 48.3. The mean number of lines of prior chemotherapy before accrual was 3. There were 17 (17/23, 73.9%) successful T-cell expansion with 6 failures (6/23, 26.1%), mean number of vials expanded being 4.29. Only grade I flu-like symptoms and malaise were documented and best response being stable disease for most patients. The time to progression (TTP) ranged from 4.8 to 18.2 months with mean TTP being 10.2 months. More importantly, NPC patients treated with autologous CTL therapy also showed significantly increased overall survival when compared to the patients who did not receive immunotherapy. Taken together, these studies demonstrate that AdE1-LMPpoly vaccine based adoptive immunotherapy is safe and well tolerated and may provide clinical benefit for NPC patients. We propose that AdE1-LMPpoly-based immunotherapy should be tested in

the adjuvant setting to further confirm its clinical benefit.

## Tissue engineering in head and neck reconstruction

Thiam Chye Lim

*Department of Surgery, National University Hospital, Singapore*

Tissue engineering, a rapidly evolving field defined as the regeneration of new tissues through scaffolds and biologic mediators, has the potential to radically change head and neck reconstructive surgery by providing off-the-shelf replacement products for cartilage, bone and nerve. The components required are a variety of matrices, signaling molecules, & stem cells. A significant amount of work has been done to generate cartilage, bone & vascular grafts. Phase III clinical trials for tissue engineered (TE) bone have begun and TE bone with BMP-2 & BMP-7 is used for lumbar fusions and long bone non-unions. Clinical application of TE bone for head and neck is limited but successful animal models with TE cartilage for nose & ear are encouraging. Work on TE mucosa consisting of keratinocytes and fibroblasts isolated from oral biopsies also show promise. Fibroblasts accelerate culturing of mucosal substitutes with the resultant mucosa mimicking native tissue. Adipose tissue represents yet another abundant source of stem cells with the potential for differentiation down osteo-, chondro-, and fat progenitor lines. These cell fractions combined with growth/differentiation factors in three-dimensional biodegradable matrices hold the promise of "ready made" parts for reconstruction of tissues & organs, especially for reconstructing the challenging wounds encountered in cancer patients.

## (Proffered) Oral Presentations

### Proton therapy for head and neck cancers – The UFPTI experience

RS Malyapa, WM Mendenhall, D Yeung, C McKenzie, NP Mendenhall, Z Li, P Okunieff

*University of Florida Proton Therapy Institute, Jacksonville, Florida, USA*

**Objective:** The clinical application of protons provides an improvement over photons in its ability to deliver a high-dose-volume to any configuration within an anatomical site while maintaining lower doses to surrounding normal tissues due to the Bragg-peak phenomenon of dose distribution of protons. This presentation will discuss clinical outcome using protons in the management of head and neck cancers.



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**Method:** More than a hundred patients (ages 15 - 81 years) with cancers of nasopharynx, nasal cavity and paranasal sinuses and oropharynx have been enrolled in protocols prospectively since January of 2007 to undergo 3D-conformal proton therapy. Doses ranged from 72 GyE delivered using a concomitant boost technique in oropharyngeal cancers to 64.8 - 69.6 GyE for post-operative negative/close margins to 74.4 GyE for gross or unresectable tumor treated at 1.2 GyE twice-a-day. Proton targets and critical structures were delineated from co-registered simulation CT and diagnostic MR images. The geometric relationship between target and critical structures were examined to select optimal proton beam parameters to achieve target-conforming and critical organ-sparing dose distributions. Proton treatments were delivered with kV x-ray imaging guidance to achieve 1 mm setup accuracy.

**Results and Conclusions:** Complete local tumor control was noted in patients with nasopharyngeal and oropharyngeal cancers after definitive proton therapy, while those patients with nasal cavity and paranasal sinus cancers who had undergone surgical resection had excellent loco-regional control after adjuvant proton therapy. Proton therapy is well tolerated and allows prescribed doses to be delivered to target without exceeding tolerance of adjacent critical structures.

## Minimally invasive management of benign pharyngeal and upper oesophageal strictures and occlusions – team based approach

Mohammed S Miah<sup>1</sup>, Ian A Zealley<sup>2</sup>, Afshin Alijani<sup>3</sup>, Rodney E Mountain<sup>1</sup>, Suresh Mahendran<sup>1</sup>

*1Department of Otorhinolaryngology-Head/Neck Surgery; 2Department of Radiology; 3Department of Upper Gastrointestinal Surgery, Ninewells Hospital & University Dundee Medical School, Dundee, Ireland*

**Objective:** Hypopharyngo-oesophageal strictures are common after head and neck chemoradiotherapy. Complete occlusion a much rarer complication. Current management methods include balloon/ bougie dilation, stricturoplasty, expandable stents and local mitomycin-c application. Surgical resection and reconstruction is a major undertaking with significant risk of serious complications. We present our experience with minimally invasive approach managing a series of patients with severe strictures or occlusions.

**Method:** Data collected prospectively on 3 cases of severe hypopharyngeal-oesophageal strictures and 2 cases of total occlusion treated between 2006 and 2010, translating two recently developed interventional radiology techniques. One technique described is used in percutaneous management of bile duct strictures and the other is the “sharp recanalization” procedure for occluded mediastinal veins. Wide bore nasogastric tube is maintained in-situ in all patients for a period of 6-9 months. An assessment of swallow using contrast medium is then performed to gauge calibre of lumen, functionality and to rule out aspiration.

**Results:** Pharyngeal-oesophageal passage re-established in all cases with evidence of sizeable oesophageal lumen through the strictures on contrast swallow tests. No complications occurred as a result of the procedures. In all of the patients near normal diet is now established with no further requirement for gastrostomy feeding.

**Conclusion:** Pharyngeal-oesophageal passage re-established in all cases with evidence of sizeable oesophageal lumen through the strictures on contrast swallow tests. No complications occurred as a result of the procedures. In all of the patients near normal diet is now established with no further requirement for gastrostomy feeding.

## Head and neck free flap surgery in the elderly – the United Kingdom Newcastle experience

David Sainsbury, Simon Filson, Omar Ahmed, Mani Ragbir

*Royal Victoria Infirmary, Newcastle-upon-Tyne, UK*

**Objective:** We review our experience of free flap surgery in the elderly patients (≥65 years) undergoing reconstruction following head and neck tumour resection.

**Method:** Data on all free flaps performed in Newcastle-upon-Tyne were prospectively collected from January 2007–December 2010. Demographic and surgical outcomes were analysed.

**Results:** One hundred and twenty-five free flaps were performed for reconstruction following tumour resection in the head and neck. Forty-seven free flaps were performed in patients ≥65 years-old (65-92 years), including 12 free flaps in super-elderly (≥80 years-old) patients. Flaps performed were: free radial forearm (n=17), anterolateral thigh (n=14), free fibula (n=9), latissimus dorsi (n=2), rectus abdominis (n=2), vastus lateralis (n=1), DCIA (n=1)



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and jejunum (n=1). Mean ASA grades were 2.2 and 2.4 in the under-65 years-old group and ≥65 years-old groups, respectively. Mean operation length was 489±107 minutes in the under-65 years-old group and 502±103 minutes in the ≥65 years-old group. Mean ischemic time was 89 minutes in both groups. Flap loss rate was 6.4% in the under-65 years group. No flaps were lost in the ≥65 years-old group. There were no significant difference in complications between patients in the under-65 years and ≥65 years-old groups.

**Conclusion:** Biological age alone should not be a contraindication to free flap surgery for reconstruction of head and neck defects in the elderly following tumour resection.

## Does type of flap or fixation affect bony union following composite reconstruction of the mandible for osteoradionecrosis

Martin Batstone

*Royal Brisbane and Women's Hospital, Brisbane, Queensland, Australia*

**Objectives:** End stage osteoradionecrosis is a significant complication of radiotherapy for head and neck cancer. Whilst the role of hyperbaric oxygen remains controversial in the management of ORN the use of resection and composite reconstruction for patients with pathologic fractures and fistulae is well established. The method of fixation of the composite flap to the native residual mandible varies amongst surgeons. This study aims to determine whether type of bony flap or method of fixation alters the success rate in composite reconstruction of osteoradionecrosis.

**Methods:** A retrospective study of all cases of osteoradionecrosis treated by the author with resection and composite reconstruction over 3 years was undertaken. Clinical and radiographic review were used to determine bony union had occurred between the native mandible and the composite flap, and within the composite flap if osteotomized.

**Results:** 14 cases of pathologic fracture of the mandible treated with resection and composite free flap reconstruction were identified. Fibula, scapula and DCIA free flaps were used. 2.0 mm miniplates or 2.4 mm locking reconstruction plates were used for fixation. There were no flap failures. 40% of patients whose flaps were fixed with miniplates achieved full bony union at all sites.

**Conclusions:** Type of fixation appears to affect the success rate of bony union between the flap and residual mandible. Reconstruction plates lead to more reliable bony union. Type of flap seems to have little effect though the numbers in this study preclude statistically significant analysis.

## Positive narrowing pharyngoplasty in oropharyngeal reconstruction to achieve velopharyngeal competence

Yugesh Caplash

*Royal Adelaide Hospital Dept Plastic & Reconstructive Surgery, Adelaide, South Australia, Australia*

**Objective:** Velopharyngeal incompetence is the most common outcome after resection of the soft palate together with malignant tumours of the Oropharynx. Specialized microsurgical reconstruction with free flaps can achieve Velopharyngeal Competence.

**Methods:** Previously I have reconstructed the soft palate and oropharynx using a folded radial forearm free flap. In this paper I am describing a new technique to achieve Velopharyngeal Competence while resurfacing the complex oropharyngeal defect. I have made an attempt to show the step by step reconstruction procedure developed at the Royal Adelaide Hospital. All patients were assessed 4 – 6 weeks and 3 months after completion of radiotherapy by the Speech Therapists through clinical evaluation, Barium swallow and naso-endoscopy.

**Result:** Superior results were achieved using this procedure.

**Conclusion:** This procedure gave consistent good results in partial soft palate, oropharyngeal reconstruction. Complete soft palate reconstruction required a folded radial forearm free flap, sutured to the post pharyngeal wall as described by Hashi Kawa in 2005 to achieve velopharyngeal competence.



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## Cervico-submental keystone design flap for major parotid defects in the elderly – a new concept in reconstruction

Felix C Behan, Michael Findlay, Cheng-Lo, Andrew Sizeland

*Peter MacCallum Cancer Institute, Melbourne, Victoria, Australia*

A series of 40 cases will be the basis of this presentation. My co-authors will be Professor Andrew Sizeland from the Peter McCallum Cancer Institute and my co-authors from the forthcoming book publication, Michael Findlay and Cheng-Lo.

The aging population is now showing with cutaneous malignancy in the head and neck, the late Arnold Levine concept – he describes the Australian Disease which illustrates multiple metastases into the parotid echelon of nodes. Resection with nodes produces large integumentary defects. Experience governs the reconstructive options. Yet in the aging population, a high incidence of co-morbidities almost necessitates a speedy alternative rather than microvascular free flap repair. This technique paper from the head and neck section of our forthcoming textbook on the Keystone Concept of Reconstructive Surgery will reveal the surgical details of elevation. This Keystone Flap is raised from the cervico-submental region. The primary defect sometimes measures 10 x 12 cm over the parotid. It is an island flap - a laminate of skin, fat, fascia and platysma. It is along the line of the C2/C3 dermatome incorporating the cervical plexus and based on unnamed perforators from the external carotid. Its axis of rotation is in the vicinity of the posterior 1/3 of the sternum mastoid muscle. Minor flap complication will be detailed. The overall success rate of 95% including its use in an irradiated tissue will be discussed. Its four characteristics are: A) Ease of elevation and speed of execution, B) the hyper-vascularity as a consequence of the islanding reinforces its reliability, C) its pain free post operative phase adds merit to this elderly group of patients and D) the aesthetic match fulfils the Gilles principle of the next best tissue is the next best tissue.

## Management of microstomia after a surgical lip resection for oral carcinoma

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**Objective:** Carcinoma of the lip comprises 25-30% of oral cancers and the accepted standard of care is surgical resection. Microstomia is a common sequelae following surgical lip resection and results in changes in facial appearance, communication, ability to maintain oral hygiene and eat normal diet safely. Unfortunately, limited clinical evidence to guide post-surgical microstomia rehabilitation, and under-referral to allied health, exposes this vulnerable population group to a reduced quality of life. Two Case Studies will be presented to highlight the benefits of rehabilitation using a combination of multidisciplinary team (MDT) management and the Microstomia Prevention Appliance (MPA) to successfully treat this functionally and socially debilitating condition.

**Method:** Two patients were referred to Speech Pathology (SP) in 2010 for microstomia management. One patient had undergone a wedge re-excision, and one a Karapandzic flap lip resection. MDT management was implemented with SP providing rehabilitation of the patients' dysphagia and dysarthria, and joint SP and Physiotherapy management targeting increased oral cavity opening. The MPA was incorporated within the rehabilitation program, as the literature supported its use with microstomia management post-facial burns.

**Results:** Both patients achieved positive results including reduction of microstomia with significantly increased oral opening, and improved functional outcomes in terms of dysphagia, dysarthria and self-confidence.

**Conclusion:** Patients who undergo surgical reconstruction for oral carcinoma should be referred to the MDT. Combined MDT management including the MPA has been proven to benefit patients' functional status and quality of life. Further research in the area of microstomia management post-surgical intervention is recommended.



# Tri-Society Head and Neck Oncology Meeting

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## **New evidence-based head and neck cancer nutrition guidelines using the Wiki platform - the way of the future in enhancing multidisciplinary care**

Merran Findlay<sup>1,2</sup>, Teresa Brown<sup>3,4</sup>, Judy Bauer<sup>5,6</sup>

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**Objective:** Prevalence of malnutrition in patients with head and neck cancer is reported at 50-75% impacting on wound healing, immune response, complications, undesired treatment breaks and unplanned hospital admissions. Consequently, nutrition intervention plays a crucial role, influencing clinical, cost and patient outcomes. Currently, there are no comprehensive evidence based guidelines for the nutritional management of this specific patient population.

**Method:** Under the auspices of the Clinical Oncological Society of Australia with funding from Cancer Institute New South Wales, a dietetic steering committee was established to develop the guidelines, and a multi-disciplinary committee was formed for consultation with key stakeholders. Following a systematic literature review, utilising a recognised levels of evidence matrix and quality criteria checklist, evidence based statements and recommendations were developed for 27 clinical questions throughout the nutrition care pathway. The guidelines are published using wiki technology.

**Results:** 276 studies were identified for independent critical appraisal. High level evidence (positive quality Level I and II studies) exists for the benefit of nutrition intervention throughout the patient care pathway allowing Grade A and B recommendations to be made. There were a number of areas identified where evidence is limited and best practice remains unclear.

**Conclusion:** The guidelines provide clinicians with access to evidence based recommendations for the nutritional care of patients with head and neck cancer. They also serve as a tool to guide future research where evidence gaps exist and aim to

influence practice internationally. The wiki format ensures ongoing currency.

## **Case series of fourteen families with first degree relatives afflicted with nasopharyngeal carcinoma.**

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**Objective:** The ethnicity of the Philippine population is a mixture of several influences which may possibly affect disease prevalence and behavior. In the latest published cancer registry, the incidence of NPC in the Philippines is 6-7/100,000. The report suggests that the Philippine population is at intermediate risk as far as incidence of NPC is concerned, but the numbers may be understated as the registry is only from Manila and Rizal. There is also literature suggesting that the SE Asian population's incidence may be as high as those seen in endemic regions in China. There are reports that the incidence of familial NPC can run as high as 15%. It is unclear whether this is true also in intermediate risk populations.

**Method:** Charts of NPC patients were reviewed for incidence of relatives also afflicted with the disease. Interviews, record review and examination of afflicted relatives were performed when the data and patients were available. Included in the analysis was ethnicity, provincial residence and origins, stage at diagnosis, treatment, status of disease, and condition at last review/interview.

Data collected was tabulated and reported.

**Results:** There were 14 families with family members afflicted with NPC 2006. A total 36 patients were identified. There were 27 males and 9 females in the series (3:1 M:F). Nine families were clustered in Central Luzon, one in extreme Northern Luzon, one in Southern Luzon and two in metropolitan Manila. No strong Chinese lineage was identified. All assessable patients had WHO3 disease as per their pathology report.

**Discussion:** In endemic regions, reports of familial clustering of nasopharyngeal carcinoma are seen. However, there seems to be very little data investigating this phenomenon. This intends to be an initial report and the authors intend to use this data as a basis for doing further genetic analysis of Filipino nasopharyngeal carcinoma patients.



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## The onset and progression of acute toxicity and patient-reported side effects during altered fractionation radiotherapy with concomitant boost (AFRT-CB) for oropharyngeal cancer

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**Objective:** There is limited research reporting the mild-moderate acute toxicity following altered fractionation radiotherapy (AFRT) and the impact on function. This study aims to explore the range of early toxicity, patient-reported barriers to oral intake, and the impact on oral intake and weight.

**Method:** Thirteen patients with T1-T3 oropharyngeal SCC were assessed weekly during and one month post-treatment with AFRT (concomitant boost). Acute toxicity was graded using the CTCAE, and patients attended weekly reviews where they reported barriers to oral intake. Diet and fluid tolerance and weight were also recorded.

**Results:** Worst acute toxicity was 31% for grade 3 mucositis and 23% for grade 3 dysphagia, and occurred in weeks 4 and 5 of treatment. Patient-reported barriers to oral intake began from week 1 for odynophagia, xerostomia, and anorexia. Barriers increased in incidence and peaked from week 3 to week 5. Diet and fluid tolerance deteriorated with 92% requiring a modified diet and 100% requiring nutritional supplementation by week 3. By one month post-treatment acute toxicity had begun to resolve, although the majority continued to require a modified diet.

**Conclusion:** Toxicity impacting on oral intake begins in weeks 1 and 2 of treatment, with increasing severity and incidence by week 3 of treatment, prior to patients commencing their twice daily "concomitant boost" treatments. The majority of patients developed mild-moderate toxicity which required diet modification. Routine recording of toxicity and barriers to oral intake needs to occur weekly until the resolution of toxicity.

## Distinct patterns of stomatitis with concurrent cetuximab and radiotherapy for head and neck squamous cell carcinoma in an Australian cohort

David Pryor<sup>1</sup>, Sandro Porceddu<sup>1</sup>, Elizabeth Burmeister<sup>2</sup>, Michael Poulsen<sup>1</sup>, Bryan Burmeister<sup>1</sup>

*1Department of Radiation Oncology, Princess Alexandra Hospital; 2Research Centre for Clinical and Community Practice Innovation, Griffith University, Brisbane, Queensland, Australia*

**Objective:** To explore the distinct patterns of stomatitis in patients receiving cetuximab-radiotherapy (RT) for head and neck cancer.

**Method:** Retrospective review of acute toxicity data from 42 patients who received 70Gy conventionally fractionated RT with cetuximab (median age 68 years) compared to a matched contemporaneous cohort of 36 patients (median age 70 years) receiving either 70Gy chemoRT (n=23) or 66Gy accelerated RT (n=13). The relationships of grade  $\geq 3$  toxicities to clinical (age, gender, evidence of sun damaged skin, smoking and alcohol history, grade of acneiform rash) and dosimetric parameters were also explored.

**Results:** Cetuximab-RT patients experienced significantly higher rates of grade  $\geq 3$  cheilitis (26% v 6%, p=0.01) and anterior stomatitis (38% v 6%, p=0.002). At first onset of  $\geq$  grade 3 toxicity the associated maximum point dose received by the lips was a median of 9.3Gy and by the anterior oral cavity was 20Gy. Multivariate analysis identified increasing severity of acneiform rash as the strongest predictor of grade  $\geq 3$  cheilitis and anterior stomatitis whilst increasing RT dose was correlated with grade  $\geq 3$  cheilitis only. A trend was observed for increasing pack years of smoking on univariate analysis but not multivariate.

**Conclusion:** The combination of cetuximab and even low doses of RT to the anterior oral cavity has resulted in a distinctive pattern of cheilitis and anterior stomatitis in our patients. Further exploration of this phenomenon may yield additional insights into the interaction of cetuximab with RT in non-target tissues.



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## Effects of a case management program on symptom severity and quality of life among head and neck cancer patients with radiation complications receiving hyperbaric oxygen therapy

Orawan Supanpop<sup>1</sup>, Chodchoi Wattana<sup>2</sup>

*1Thammasat University; 2Tanasawat Chaikun, Thai Royal Navy Hospital, Thailand*

**Objective:** This quasi-experimental study aimed to examine the effects of a case management program on symptoms severity and quality of life among head and neck cancer patients with radiation complications receiving Hyperbaric Oxygen Therapy.

**Method:** A sample of 13 participants who met the research criteria were received the Case Management Program that was developed based on Symptom Management Model (Dodd, 2001) for a period of 30- day. The symptoms severity and quality of life were measured at baseline, 10- day, 20- day, and 30- day. The symptom severity and quality of life questionnaire were tested for validity and reliability. Data were analyzed using Friedman and Wilcoxon signed-Rank test.

**Results:** The results revealed that at 10-day, the participants showed significant decrease only in pain score than baseline. At 20-day and 30-day after enrolled the program, the results showed that participants had significant decreased of pain score, taste impairment, saliva gland dysfunction, dysphagia and sleep disturbance compared to baseline but trismus were not difference. In addition, the participants had not significant increased in quality of life at 10-day compared baseline. However, at 20-day and 30-day after enrolled the program, the participant had significant increased in total quality of life compared to baseline.

**Conclusion:** Results indicated that the case management program is effective to decrease symptom severity and improve quality of life among head and neck cancer with radiation complications. Further study is needed to evaluate the effectiveness of intervention using a comparison group.

## A retrospective review of enteral feeding practices in head and neck oncology patients at a single centre

Belinda Vangelov<sup>1</sup>, Robert Smee<sup>2</sup>

*1Department of Nutrition and Dietetics; 2Department of Radiation Oncology, The Prince of Wales Hospital, Sydney, new South Wales, Australia*

**Objective:** Nutrition intervention in head and neck cancer patients has been shown to improve and maintain nutritional status. Many patients require enteral feeding to maintain optimal nutritional status throughout treatment and some may require long term feeding as a result of prolonged side effects. Recently released Clinical Oncology Society of Australia (COSA) evidence based guidelines gave a grade B recommendation for the use of prophylactic tube feeding, and using tube feeding to help minimise weight loss. Determining which patients will require enteral feeding, when to place feeding tubes and which tubes to use are widely debated issues, as selection criteria has not been fully defined. A qualitative retrospective review of enteral feeding practices in patients who received radiotherapy at The Prince of Wales Hospital is being conducted to compare nutritional parameters, the use of different feeding methods and determine whether trends or variables exist that can be used as predictors for the need for a feeding tube.

**Method:** A data collection form was designed to target weight, BMI, enteral feeding methods, duration of feeding and nutritional impact symptoms. Audited records include patients with oropharynx, hypopharynx, base of tongue, oral cavity and nasopharyngeal carcinoma ( $\pm$  larynx) who have had definitive radiotherapy ( $\pm$  surgery / chemotherapy).

**Results:** The study is currently in the data collection phase. We anticipate the data will demonstrate where changes in current practice are required.

**Conclusion:** It is envisaged that the review of our nutritional data will add to current available evidence and further guide clinical practice.



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## Trismus prevalence and predictive factors in a New Zealand tertiary head and neck oncology service

Shirley James<sup>1</sup>, Paul Rigby<sup>2</sup>, Kate Sutherland<sup>3</sup>, Ruth Wickens<sup>4</sup>, Linda Williams<sup>5</sup>, Jamie Evans<sup>4</sup>, David Hamilton<sup>4</sup>, Swee T Tan<sup>6</sup>

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**Objective:** We sought to identify the prevalence of both objective and functional trismus in a cohort of patients with head and neck cancer treated with curative intent. We also analyzed patient, disease and treatment factors to identify predictive factors for developing trismus.

**Method:** We analyzed the databases of 2 head and neck clinics in the greater Wellington region for patients with malignant disease treated with curative intent between the 1st of July 2008 and the 30th of June 2010. Patients were included if the tumour treated originated from the oral cavity, oropharynx, hypopharynx, nasopharynx, salivary glands or cervical nodes with unknown primary. Patients with known recurrence or another primary at the end of data collection were excluded. The prevalence of trismus was calculated using objective (inter-incisor/alveolar ridge distance) and functional (patient questionnaire) measures. Predictive factors studied included age, sex, ethnicity, histology, tumour site, tumour stage, treatment modality/ies, radiation dose, use of therapeutic measures and time from treatment to assessment

**Results:** We identified 34 patients who were suitable for analysis. The prevalence of trismus and analysis of predictive factors will be presented at the conference.

**Conclusion:** This pilot study is a platform for further prospective studies. Ultimately prevention and interventional studies are required to improve outcomes for our patients.

## Quality of life in head and neck cancer patients treated with a curative intent

Su-San Khong<sup>1</sup>, Shirley James<sup>1</sup>, Swee T Tan<sup>1-3</sup>

*<sup>1</sup>Head & Neck / Skull Base Surgery/Oncology Programme, Wellington Regional Plastic, Maxillofacial & Burns Unit, Hutt Hospital; <sup>2</sup>Gillies McIndoe Research Institute; <sup>3</sup>University of Otago, Wellington, New Zealand*

**Objective:** Quality of life (QoL) assessment is essential to determine the treatment outcome of head and neck cancer patients who often require radical surgery and/or radiotherapy may impair function and aesthetics. This pilot study aims to evaluate the QoL of head and neck cancer patients treated at our Head and Neck Centre.

**Method:** QoL was assessed prospectively using the EORTC QLQ-C30 and QLQ-H&N35 questionnaires before and at least 12 months after treatment in patients treated with a curative intent. Patients were identified from our Head and Neck database from September 2009 to March 2010. Clinical variables assessed included gender, age, tumour location, stage and surgery.

**Results:** 17 patients with SCC (88.2%) and melanoma (11.8%) located in the oral cavity (47%) and metastatic skin cancer (53%) were included. 64.7% of the patients had Stage IV disease. Analysis demonstrated modest reduction (10 - 20/100) of role and emotional function, pain, sleep disturbances, nausea and vomiting, and dry mouth ( $p < 0.05$ ). The biggest deterioration was sticky saliva (>30/100) ( $p < 0.05$ ).

**Conclusion:** Our results demonstrated the expected reduction of QoL during the first 2 years after treatment. However, the deterioration was modest despite the radical nature of treatment; and is more acceptable compared to the outcome without treatment. A larger patient population is required to substantiate our findings.



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## Merkel cell carcinoma of the head and neck: does wide excision matter?

Matthew Foote<sup>1</sup>, Garth F Essig, Jr<sup>2</sup>, John J Christophel<sup>3</sup>, Paul A Levine<sup>3</sup>, Michael Poulsen<sup>1</sup>

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*2Department of Otolaryngology, Head and Neck Surgery, the Ohio State University, Columbus, Ohio;*  
*3Department of Otolaryngology, Head and Neck Surgery, University of Virginia, Charlottesville, Virginia, U.S.A*

**Objective:** The primary aim of the study is to determine whether margin status affects survival in patients undergoing post treatment radiation.

**Method:** A retrospective cohort analysis of 77 patients with Merkel cell carcinoma (MCC) of the head and neck was performed. Data was collected from 2 tertiary care institutions (Metro South Radiation Oncology, Brisbane, Australia; University of Virginia, Charlottesville, Virginia, U.S.A). All patients were staged using the Memorial Sloan Kettering (MSK) staging system for MCC and underwent excisional surgery followed by radiation therapy (XRT).

**Results:** Twelve patients had a positive margin, 42 a narrow margin (<2cm) and 23 a wide margin (>2cm). Kaplan Meier survival analysis was performed to analyze stage and margin status. Overall survival at 5 years was 55%, and there were no significant differences in overall survival by geographic location ( $p = .537$ ). Disease free survival was 41% at 5 years. MSK staging predicted disease free survival ( $p = .034$ ). Disease free survival was not significantly different between margin status groups ( $p = .682$ ) or between patients who underwent only radiation therapy versus surgery and postoperative radiotherapy ( $p = .604$ ). Cox regression analysis for survival revealed significant predictors of age, stage of disease, and use of chemotherapy, but failed to show added benefit of surgery prior to XRT when compared to XRT alone.

**Conclusion:** Wide excision adds no benefit to disease free survival in patients treated with excisional surgery and postoperative radiation therapy. For all stages combined, surgery prior to XRT added no survival benefit when compared to XRT alone.

## RTN2 trial update: An international randomised trial of post-operative radiation therapy following wide excision of neurotropic melanoma of the head and neck (TROG 08.09/ANZMTG 01.09)

Matthew Foote<sup>1</sup> on behalf of the Trial Management Committee

*1Metro South Radiation Oncology, University of Queensland, Brisbane, Queensland, Australia*

**Objective:** The primary objective of the trial is to determine, in patients who have undergone surgery with curative intent for neurotropic melanoma, whether there is a difference in the rate and timing of local relapse between patients who are treated with post-operative radiation therapy and those that are initially observed.

**Method:** This is a two-arm, multicenter, open label randomised trial which aims to determine whether the addition of radiation therapy to surgery is effective in decreasing the rate of local relapse in patients with neurotropic melanoma. Eligible patients will be randomised in the ratio of 1:1 between the two arms, initial radiation therapy and initial observation. The recommended technique of radiation therapy is a simple approach to treating the surgical bed with the described margin with a dose of 48Gy in 20 fractions. The expected duration of the trial is 5 years accrual with a further follow-up period of 5 years.

**Results:** First patient randomised in early 2010 but several protocol amendments made. The study re-opened late 2010 Princess Alexandra Hospital and Mater Hospital, Brisbane, Australia. Four patients since randomised. Activation strategy rolled out early 2011 and now has 10 Australian sites and 6 overseas sites in various processes of activating the trial.

**Conclusion:** The purpose of this trial is to verify that radiation therapy has a role in the local management of neurotropic melanoma in the postoperative setting. It is an ambitious trial that is unlikely to ever be replicated and therefore requires a collaborative effort.



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## Metastatic cutaneous head and neck squamous cell carcinoma involving cervical lymph nodes: The Westmead hospital experience and review of the literature

Allen Yu-yu Wang, Carsten Palme, Gary Morgan, Inars Kalnins, Ken Tiver, Lakmalie Perera, Val Gebiski, Jeffrey Tzu-yu Wang, Michael Veness

*Head and Neck Cancer Service, Westmead Hospital; University of Sydney, Sydney, new South Wales, Australia*

**Objective:** To compare the outcome of surgery alone versus surgery plus adjuvant radiotherapy in patients with metastatic cutaneous head and neck squamous cell carcinoma (HNSCC) to cervical lymph nodes.

**Method:** Patients with metastatic cutaneous HNSCC involving cervical lymph nodes were identified from a prospective database and analysed. Primary outcome measures included regional and distant control, recurrence rates, disease free (DFS) and overall survival (OS). A review of the literature was undertaken.

**Results:** Between 1980 and 2008, 122 patients were treated with curative intent. Median age was 66 years (range 18-95) in 96 men and 26 women with a median follow-up of 57 months. Most underwent surgery and adjuvant radiotherapy (102/122; 84%). Most metastatic nodes were located at level I (46/122; 38%) and were stage N2b (53/122; 43%). Following surgery alone, 11 patients (55%) developed a recurrence compared to 23 patients (23%) after surgery plus adjuvant radiotherapy. On multivariate analysis, immunosuppression, surgery alone, extracapsular spread, nodal stage >N1 and increasing age significantly predicted worse survival. Patients undergoing surgery plus adjuvant radiotherapy had a significantly better 5-year OS (66% vs 27%;  $P=.003$ ) and 5-year DFS (74% vs 34%;  $P=.001$ ) compared to surgery alone.

**Conclusion:** In concordance with the literature, patients with metastatic cutaneous HNSCC involving cervical lymph nodes, survival was significantly improved with the addition of adjuvant radiotherapy.

## Sarcomas of the head and neck: experience from a tertiary referral centre in New Zealand

Ben McIntyre<sup>1</sup>, Craig MacKinnon<sup>1</sup>, Charles Davis<sup>1,3</sup>, Swee T Tan<sup>1-3</sup>

*1Head & Neck / Skull Base Surgery/Oncology Programme, Wellington Regional Plastic, Maxillofacial & Burns Unit, Hutt Hospital; 2Gillies McIndoe Research Institute; 3University of Otago, Wellington, New Zealand*

**Objective:** Sarcomas of the head and neck are a rare and heterogeneous group of tumors that pose management challenges. We report our experience with these tumors from a tertiary head and neck referral centre.

**Method:** Patients treated for sarcoma 1997-2011 were culled from our prospectively maintained head and neck database.

**Results:** 30 patients (33 sarcomas) were identified from a total of 1038 patients. There was a bimodal age distribution with 7 paediatric (average 9yrs) and 23 adult (average 53yrs) patients with no gender difference. The most common subtypes were rhabdomyosarcoma (n=7) and osteosarcoma (n=6). The most frequent sites affected were the skin and soft tissues (n=10), mandible (n=7), and skull base (n=5) with an average tumour size of 5.5cm. Of the 28 patients (31 sarcomas) who underwent resection, 7 had neoadjuvant chemotherapy and 11 had post-operative radiotherapy. 18 patients underwent free flap reconstruction. Surgical complications occurred in 11 (39%) patients, most commonly neck haematoma (n=2) and flap complication (n=6). 63% of these patients remain alive during the follow up period (average, 5.7 yrs; range 5 months-20yrs) with no deaths occurring after 4.4yrs. 77% of the 27 patients (30 sarcomas) who underwent curative resection were disease free. 50% of the 8 patients who had a positive resection margin died from the disease.

## Survival outcomes for lateral temporal bone resection in metastatic cutaneous head and neck malignancies

Tom Moran, Ann O Connor, Conrad Timon

*ENT Department, St. James's Hospital, Dublin, Ireland*

**Objective:** To evaluate the survival outcomes for patients who underwent a lateral temporal bone



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resection in metastatic cutaneous head and neck malignancies

**Method:** A single institute study retrospective review was carried out for patients who underwent a lateral temporal bone resection for malignancies between 2000 and 2010. The Pittsburgh staging system was used to determine tumour classification. Patient demographics, surgical procedure, tumour histology, treatment course and clinical outcomes were recorded. Overall and disease free survival was calculated.

**Results:** 47 patients were identified who underwent a lateral temporal bone resection. Mean age of 75.5 years. Mean follow up was 24 months. 53.2% presented with recurrences at the site of previous surgical resection. 74.5% had Stage IV disease. 85.2% had SCC, 10.6% had BCC and salivary carcinoma 4.2%. 87.2% had a parotidectomy, 93.6% had a neck dissection of which 51% had nodal involvement. 44.7% had surgery only, 53.2% had adjuvant radiotherapy. The overall complication rate was 6.3%. Five year overall survival was 28% and Disease free survival was 24%

**Conclusion:** 47 patients were identified who underwent a lateral temporal bone resection. Mean age of 75.5 years. Mean follow up was 24 months. 53.2% presented with recurrences at the site of previous surgical; resection. 74.5% had Stage IV disease. 85.2% had SCC, 10.6% had BCC and salivary carcinoma 4.2%. 87.2% had a parotidectomy, 93.6% had a neck dissection of which 51% had nodal involvement. 44.7% had surgery only, 53.2% had adjuvant radiotherapy. The overall complication rate was 6.3%. Five year overall survival was 28% and Disease free survival was 24%.

## **Cervical metastasis of squamous cell carcinoma of the maxilla: A retrospective analysis of 110 cases over two continents**

Matthew Potter 1,2, Athanasios Kalantzis<sup>1</sup>, Marcia Mickelburgh<sup>2</sup>, Graham Dickie<sup>2</sup>, Martin Batstone<sup>2</sup>, William Cockburn<sup>2</sup>, Vidella Hinckley<sup>2</sup>, Reg Anand<sup>1</sup>, Steve Bond<sup>1</sup>, Stephen Watt-Smith<sup>1</sup>

*1John Radcliffe Hospital, Oxford, UK; 2Royal Brisbane Hospital, Brisbane, Queensland, Australia*

**Objective:** The aim of this study was to investigate the need for elective neck dissection in the treatment of Squamous Cell Carcinoma (SCC) of the maxilla.

**Method:** One hundred and ten patients with SCC of the maxillary alveolus and palate were reviewed on two sites; the John Radcliffe Hospital, Oxford, UK and the Royal Brisbane Hospital, Queensland, Australia, between 2000 and 2010. Data related to cervical metastasis was collected retrospectively, and related to T stage, histological grade and depth of invasion.

**Results:** 21% of the cohort at the time of presentation had clinically or radiologically evident ipsilateral nodal disease. Overall nodal metastatic rate through the course of treatment was 34%. Neck disease was not associated with the histological grade or tumour front but was associated with lymphovascular invasion of the primary. All positive necks were associated with primaries demonstrating > 4 mm of invasion. Maxillary tumours less than 4mm invasive depth did not develop cervical nodal metastasis.

**Conclusion:** In our study 34% of patients with maxillary SCC developed cervical metastases through their course of treatment. This study supports ipsilateral neck dissection for patients with maxillary tumors greater than 4mm in depth.

## **Outcomes of patients with adenoid cystic carcinoma of the minor salivary glands**

Adrian DeAngelis, Alpha Tsui, David Wiesenfeld, Arun Chandu

*Head and Neck Oncology Tumour Stream, The Royal Melbourne Hospital, University of Melbourne, Melbourne, Victoria, Australia*

**Objective:** To assess the clinical behaviour, response to treatment and factors affecting survival in patients with adenoid cystic carcinoma of the minor salivary glands treated at a tertiary referral centre.

**Method:** Ethics approved retrospective review of clinical and pathological records was undertaken for 24 patients managed by The Royal Melbourne Hospital Head and Neck Oncology Tumour Stream over a 22 year period.

**Results:** Treatment was a combination of surgery with adjuvant radiotherapy. The overall 5, 10 and 20 year survival rates in this study were 92%, 72% and 54% respectively. Increasing T stage ( $p=0.034$ ) was found to significantly affect survival using Kaplan Meier analysis with log rank tests. The adverse effect of perineural invasion, found in 63%, on survival approached significance ( $p=0.085$ ).



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**Conclusion:** The study confirms the conclusion of previous studies that tumour size at diagnosis is the most important predictor of outcome.

## The clinical outcome of head and neck malignancy patients using integrated positron emission tomography computed tomography (PET/CT) - an initial experience

Sethu T Subha<sup>1,2</sup>, Abdul J Nordin<sup>2</sup>, Fathinul FA Saad<sup>2</sup>, Saraiza A Bakar<sup>3</sup>, Muhamad Azrif<sup>4</sup>, Johnson Stanslas<sup>1</sup>

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**Objective:** The incidence of head and neck cancers in Malaysia is rising. Adding to the limitation of conventional imaging modalities, there are substantial number of patients presented with carcinoma of unknown primary where accurate staging is an important prognostic determinant of the disease outcome. Thus, the aim of this study is to find the usefulness of FDG PET/CT in head and neck cancer staging comparing to clinical staging.

**Method:** This prospective study involved patients from ENT clinic of Hospital Serdang and Hospital UKM. All patients were histologically proven primary head & neck malignancy and clinically staged using TNM staging system. All patients also underwent whole body 18F-FDG PET/CT study at the Diagnostic Nuclear Imaging Centre of Universiti Putra Malaysia. The clinical staging and PET/CT results were compared. This study had prior approval from institutional ethic committees.

**Results:** There were 24 patients involved in this study with male preponderance (16:8) and mean age 51.5. Nasopharyngeal carcinoma has the highest incidence, followed with laryngeal, thyroid and oropharyngeal carcinomas. The adenexal, occult primary, lymphoma, sarcoma and metastatic adenocarcinoma are less common. 18F-FDG PET/CT provided additional information in 66% of patients, upstaged 58% of patients with significant change in tumor, nodal and metastases staging comparing with clinical staging.

**Conclusion:** 18F-FDG PET CT can be important single modality in head and neck malignancy for

adequate treatment planning in view to minimize treatment related toxicity & functional impairment.

## Head & neck cancer: Squamous cell carcinoma nodal disease - how can we use the information

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**Objective:** The presence of nodal disease has a significant impact on outcomes for patients with Head/Neck cancers. This review will present data on the proportion/extent of nodal-disease at presentation across a number of different disease sites. This may enable more specific nodal disease management.

**Method:** In this Ethics approved initially retrospective but from mid-2009 prospective study, the Head & Neck database was audited, the disease sites being-Larynx, Hypopharynx, Oropharynx, Oral Cavity, Nasopharynx, Paranasal Sinus and Salivary Glands, the only specific criterion being definitive treatment at POW Cancer Centre. Attention is paid to initial presentation using clinical, radiological evaluation as to the presence and sites of nodal disease, this being imputed into the SPSS disease specific sub-site database, allowing statistical evaluation.

**Results:** Within the larger database there are: larynx-1175, oropharynx-482, oral cavity-542, nasopharynx-103, salivary gland-116, paranasal sinus-111, patients for whom information is available, re presence and site of nodal disease. As an example within Oral Cavity (542 patients) there were N1-91 (17%) N2-74 (14%) and N3-4 (0.7%) with bi-lateral and contra-lateral infrequent, with the likelihood of level 3 and 4 involvement proportionally linked to level 2 disease, level 5 involvement very infrequent. Thus treatment of level 5 by either surgery or radiotherapy is unnecessary in the great majority of patients. This process of defining nodal sites to be treated can be addressed across all sites.

**Conclusion:** There is an ordered pattern of spread typically in H & N SCC, this information can be used to drive the specific site of treatment offered.



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## Extent of neck dissection and outcome in patients with metastatic cutaneous head and neck squamous cell carcinoma involving cervical lymph nodes: the Westmead hospital experience and review of the literature

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**Objective:** To compare outcome in patients undergoing either selective neck dissection (SND) or modified radical neck dissection (MRND) with metastatic cutaneous head and neck squamous cell carcinoma (HNSCC) involving the cervical lymph nodes.

**Method:** To compare outcome in patients undergoing either selective neck dissection (SND) or modified radical neck dissection (MRND) with metastatic cutaneous head and neck squamous cell carcinoma (HNSCC) involving the cervical lymph nodes.

**Results:** Median age was 66 years (range 18-95) in 96 men and 26 women with a median follow-up of 57 months. Sixty-six patients (54%) underwent SND and 56 patients (46%) underwent MRND. One hundred and two patients (84%) underwent both surgery and adjuvant radiotherapy. The overall recurrence rate was 28% (34/122) with 71% (24/34) developing a regional recurrence. Patients undergoing SND had a lower regional recurrence (17% vs 23%) and non-regional recurrence (5% vs 13%) compared to MRND. On univariate and multivariate analysis there was no significant difference in DFS and OS between patients undergoing SND and MRND.

**Conclusion:** As most patients will receive adjuvant radiotherapy, we report no benefit for patients undergoing more extensive surgery (SND vs MRND). Less extensive surgery is also likely to result in less surgical morbidity.

## Different approaches to volume assessment of lymph nodes in CT Scans of HNSCC in comparison with a real gold standard

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**Objective:** Volume assessment in head and neck squamous cell carcinoma (HNSCC) becomes an increasingly important parameter in treatment planning and response control. Various authors showed a significant impact of tumor volume on outcome and local control. Regarding the increasing impact of neoadjuvant therapies, the need for an adequate measuring tool becomes obvious. In this study we compared the "gold standard", the diameter based approach, with segmentation based approaches. Our second purpose was testing the new segmentation algorithms on real tissue, since no sufficient studies exist to compare algorithm derived results with true volumes.

**Method:** The segmentations were based on CT scans of 4 patients with HNSCC undergoing neck dissection as part of their treatment. These scans were taken during staging and 20 lymph nodes were segmented. They were selected by size and location close to reproducible anatomical structures, ensuring accurate resection. Segmentations were generated by three experienced (consultant level) radiologists. The true volumes were measured by water displacement. Diameter based results and segmentation derived results were compared with true volumes.

**Results:** Pearson's correlation index shows higher correlation of the diameter generated volumes ( $r=0.723$ ) than results generated via segmentation ( $r=0.527$ ) with the true volumes. Nonetheless diameter generated volumes show clearly too high volumes at 146.8% (CI: 115.8% – 186.1%). Volumes generated with the segmentation are at 116.5% (CI: 93.9% – 144.7%).

**Conclusion:** The data show higher reliability of volumes estimated by the segmentation based approach than the widely used diameter based approach.



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## Intraoral cone radiotherapy in cancer of oral cavity

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**Objective:** To evaluate the treatment result of intra-oral cone (IOC) with or without external radiotherapy as primary treatment for patients with carcinoma of oral cavity

**Method:** Between the years 1997-2011, 14 patients were identified for retrospective review. Statistical analysis with Kaplan Meier method was performed for disease free survival (DFS) and overall survival (OS).

**Results:** Twelve (93%) patients were male; median age 68 (45-83). All have squamous cell carcinoma. Tongue was the commonest primary site (N=9). Nine (64.3%) has significant co-morbidities. Five (35.7%) were not fit for surgery, 4(28.6%) refused surgery. Eleven (78.6%) were T1 or T2, 3(21.4%) were T3 or T4.

Two (14.3%) and 12(85.7%) received IOC alone and both IOC and external radiotherapy respectively. Two (14.3%) received concurrent chemotherapy. The most commonly used regime were 3Gy/fr for 7 to 8 fractions (ranged from 2 - 3Gy/fr for 3 – 19 fractions). Dose of locoregional external radiotherapy ranged from 50Gy to 66Gy (median= 50Gy). The median follow up time was 54.5 months (48 days - 4718 days). The 2 year and 5 year DFS and OS were 90.9% and 79.5%, and 90% and 80%, respectively. Three (21.4%) developed local recurrence and all have salvage surgery done. Eleven (78.6%) have organ preservation.

Three (21.4%) developed grade 3 mucositis, 1(7%) developed radionecrosis, 1(7%) developed sarcoma.

**Conclusion:** Intra-oral cone radiotherapy is an effective means for primary tumor in oral cavity with organ preservation. It is a feasible option of treatment when the patient is too old, not fit, refused surgery or brachytherapy.

## Non-smoking non-drinking elderly females: A distinct oral SCC subgroup

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**Objective:** There are several distinct subgroups of patients with Oral Squamous Cell Carcinoma (OSCC). At the Royal Melbourne Hospital there has been a distinct population of Non-smoking, Non-drinking (NSND) elderly women who have presented with OSCC. This presentation aims to report on our epidemiological findings and highlight NSND elderly women as a distinct OSCC subgroup.

**Methods:** A total of 169 patients (97 males, 72 females) presenting to the Royal Melbourne Hospital between January 2007 and July 2010 with oral SCC were included. Age at diagnosis, tobacco and alcohol exposure, tumour characteristics (differentiation, sub-site, TNM, lesion thickness), disease-free survival rates and mortality data were obtained from the BioGrid tumour database, and clinical records. Survival for patients with local recurrence was calculated from date of surgical treatment.

**Results:** We found the female NSND group (n=30) to be older than average, when compared to the entire population of OSCC patients (72.2 to 65.5,  $p < 0.05$ ). For the NSND patients there was a bimodal age distribution compared to the Smoking/Drinking group. The ratio of males: females overall was 1.3:1, however, a significantly higher proportion of females was seen in the NSND group (76.9% female NSND,  $p < 0.05$ ). In all groups, the oral tongue was the most common sub-site for OSCC. No statistically significant difference was noted for both tumour stage and nodal involvement between the female NSND group and the rest of the OSCC patient population. The elderly NSND females had a poorer survival rate compared to the smoking and drinking group ( $p < 0.05$ ).

**Conclusion:** The identification of the NSND elderly female subgroup will lead to further research (such as clinical, histological and biochemical attributes) to improve clinical management.



# Tri-Society Head and Neck Oncology Meeting

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## The effect of renin-angiotensin system modulators on the risk of recurrence in patients treated with oral cavity squamous cell carcinoma

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**Objectives:** To determine the effect of renin-angiotensin system modulators (RASM),  $\beta$ -blockers and ACE inhibitors (ACEi) or angiotensin receptor blocker (ARB), on the recurrence rate of patients treated with oral cavity squamous cell carcinomas (SCC).

**Methods:** Patients with oral cavity SCC were culled from our head and neck database from 1990 to 2010. Records of the use of RAS modulators were obtained from general practitioners and hospital records for each patient. Information on  $\beta$ -blocker, ACEi or ARB use was recorded. The data was analysed and compared between patients taking a RAS modulator and those not taking a RAS modulator. The patients were stratified into early-stage (stages I and II) and late-stage (stages III and IV) diseases.

**Results:** Of the 177 eligible patients, overall recurrence rate was 36/177 (20.3%). The recurrence rates in patients taking a RAS modulator was 9/66 (13.6%) compared with 27/111 (24.3%) in those not taking these medications with a relative risk (RR) of 0.56. For early disease patients taking RASM had a recurrence rate of 4/34 (11.8%) and 7/44 (15.9%) in those who were not on RASM. However, for late disease patients taking RASM had a recurrence rate of 5/32 (15.6%) compared with those who were not on RASM 19/66 (28.8%).

**Conclusions:** This study suggests that RASM may confer a reduction in the recurrence risk of oral cavity SCC especially in patients with late-stage disease.

## Renin-Angiotensin system modulators and tumor vasculogenesis in patients treated for oral cavity squamous cell carcinoma

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**Objectives:** To determine the correlation between the administration of renin-angiotensin system modulators (RASM) -  $\beta$ -blockers, ACE inhibitors (ACEi) or angiotensin receptor blocker (ARB) and the extent of tumour vasculogenesis in patients treated for oral cavity squamous cell carcinoma (SCC).

**Methods:** Consecutive patients treated for oral cavity SCC were culled from our head and neck database from 1990 to 2010. Records of the use of RASM -  $\beta$ -blocker, ACEi or ARB, were obtained from general practitioners and hospital records for each patient. Immunohistochemical staining for CD34 on paraffin sections of oral cavity SCC and Chalkley counts were performed as a measure of vasculogenesis.

**Results:** Of the 78 patients treated for oral cavity SCC the mean Chalkley count in patients taking a RASM was 7 compared with 4 in those not taking these medications.

**Conclusions:** This study suggests that RASM is associated with a reduction in tumour vasculogenesis. The inhibitory effect of RASM on tumour vasculogenesis may explain the decreased rate of tumour recurrence in patients treated for oral cavity SCC.



# Tri-Society Head and Neck Oncology Meeting

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## Can epidermal growth factor receptor gene amplification predict the clinical course of early stage oral squamous cell carcinoma?

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**Objective:** The majority of patients with early stage (I and II) oral squamous cell carcinoma (OSCC) have an excellent prognosis and can be cured of disease. Nevertheless, a small proportion (10-30%) of these patients have poor outcomes and die within 2 years of diagnosis. There is evidence that epidermal growth factor receptor (EGFR) gene amplification, located on chromosome 7, is associated with poor prognosis in head and neck cancers. The present study investigates EGFR gene copy number in early stage OSCC and correlates gene status with patient outcome.

**Method:** One hundred and twenty one consecutive cases of OSCC treated surgically at Sunderland Royal and Newcastle upon Tyne Hospitals, United Kingdom were studied. Formalin-fixed paraffin-embedded tissue samples were tested using dual in situ hybridisation for chromosome 7 and the EGFR gene. Tumours were also examined using immunohistochemistry for EGFR internal and external receptors (Ventana Medical Systems, USA).

**Results:** Of the 121 patients in our cohort, 17 patients developed recurrence at the primary site and 1 patient developed a second primary OSCC. Eleven patients went on to develop regional metastases. One patient developed pulmonary metastases. The 3 year recurrence free survival and overall survival was 70% and 79% respectively. Preliminary data indicates that EGFR gene amplification is infrequent (approximately 5% of cases) in early stage OSCC. There was no correlation with negative clinical outcomes.

**Conclusion:** EGFR gene amplification correlates with increased receptor expression. EGFR gene copy number appears to be of no use as a prognostic marker in early stage OSCC.

## Multicenter experience in induction/neoadjuvant TPF chemotherapy for Chinese patients with advanced head and neck cancer in Hong Kong

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**Objective:** To report the results of induction/neoadjuvant TPF (docetaxel, cisplatin, 5-fluorouracil) chemotherapy.

**Method:** Patients with advanced head and neck cancers (HNC) from 4 oncology centers treated with induction/neoadjuvant TPF from mid-2006 to mid-2009 were retrospectively reviewed.

**Results:** All 29 patients had stage III/IV primary squamous cell (n=27) or EBV-negative PD carcinoma (n=2) of oropharynx, hypopharynx, larynx, oral cavity, oesophagus, maxillary sinus, or neck nodal metastases of unknown primary. A total of 81 cycles of TPF chemotherapy were delivered before definitive surgery or chemoRT; the median cycle number per patient was 3 (range=1-4). The mean relative dose intensity of docetaxel, cisplatin, and 5-fluorouracil was 0.93, 0.93 and 0.86 respectively, based on the standard Tax323 regimen. Febrile neutropenia was observed after 5 cycles, and sepsis documented in 2 patients. The chemotherapy response rate was 68% (2 CR & 17 PR). 21 of the 28 assessable patients (75%) achieved an overall CR after TPF and local treatment, with similar results after surgery or chemoRT. Patients with concurrent cisplatin or carboplatin managed to receive a median total dose of 200mg/m<sup>2</sup> and & AUC 10 respectively. At analysis, 9 patients had progressed and 5 had died. 19 patients are still alive without disease while 5 patients are alive with disease. The median PFS and OS were 14.4 months and 14.6 months respectively.

**Conclusion:** TPF chemotherapy given before definitive surgery or chemoRT is well tolerated. High rates of CR and early cancer control can be achieved with organ-preserving treatment comprised of induction TPF and high-dose chemoRT.



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## Experience on concurrent use of Cetuximab and radiotherapy in Chinese patients with locoregionally advanced head and neck cancer

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**Objective:** A retrospective analysis of clinical characteristics and treatment outcomes of Chinese patients (pts) with Locoregionally Advanced Head and Neck Cancer (LAHNC) treated with concurrent Cetuximab and Radiotherapy (RT)

**Method:** Thirty-one pts with LAHNC treated between May 2008 and July 2010 were included. Cetuximab was initiated one week before and then weekly during RT treatment. Majority had prescribed RT dose of 70Gy.

**Results:** Patient's age ranged from 45-84 years (median, 67 years) and 77% were male. Majority (65%) had comorbid diseases and 35% had KPS of 70 or less. Thirty pts had squamous cell carcinoma and one pt had undifferentiated carcinoma. Primary tumor sites were larynx (n=12), oropharynx (n=8), oral cavity (n=7), hypopharynx (n=3) and maxillary sinus (n=1). FU times ranged from 5-31 months (median, 16 months) . Response rate was 80% (CR 64 %; PR 16%). Median locoregional control (LRC) was not reached (1-year and projected 2-year LRC were 70% and 55.1%). Median progression-free survival (PFS) was 12.5 months ( 1-year and projected 2-year PFS were 50.9 % and 40%) . Median overall survival (OS) was 25.3 months (1-year and projected 2-year OS was 65.2% and 60.2%). Treatment toxicities of grade 3 or more included oral mucositis (53%), radiation dermatitis (26%) and infection (13%). Majority (84%) received eight doses of Cetuximab.

**Conclusion:** Cetuximab given concurrently with RT was well tolerated and not associated with significant increase in incidence or severity of RT-induced mucositis and dermatitis. Our data demonstrated favorable tumor response rate and LRC duration that are comparable to the pivotal clinical trial.

## Total laryngectomy: A ten year audit

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**Background:** Primary radiotherapy, chemo-radiotherapy and organ preservation surgery has become standard practice in the management of laryngeal cancer. Primary laryngectomy or laryngopharyngectomy is generally reserved for locally advanced laryngeal cancer.

**Objective:** In view of this our aim was to assess the demographics, disease staging, complications and survival of patients undergoing surgery for upper aero-digestive tract malignancy.

**Method:** Retrospective study of all patients undergoing total laryngectomy or laryngopharyngectomy between November 1999 and December 2009, regardless of primary site, at a UK teaching hospital.

**Results:** A total of 86 patients (89% Caucasian) with a mean age of 86 were included. 69 (80%) had laryngeal primaries and 61 (71 %) underwent primary surgery (76 % total laryngectomy, 23% laryngopharyngectomy). 69 patients (80%) had pT3 or pT4 disease. 76 patients underwent neck dissection (88%). This was bilateral in 61 cases (71%). 34 patients had pathologically involved nodes. 14 cases were bilateral. 31 cases had extra-capsular spread. 36% of patients survived 5 years or more. 44 patients (51%) passed away within 5 years of surgery.

**Conclusion:** In a multi-cultural area no patient of African/Afro-Caribbean or Chinese ethnicity underwent surgery. This has not been described in current literature. The majority of patients underwent bilateral neck dissection. Nearly 50% of these patients had involved lymph nodes, of which 91% had extra-capsular spread emphasising the need for neck dissection. 5 year survival remains low reflecting the difficulty in treating advanced disease despite aggressive treatment.



# Tri-Society Head and Neck Oncology Meeting

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## Development of endoscopic optical coherence tomography (OCT) for laryngeal cancer screening – ex vivo data analysis

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**Objective:** OCT is an optical “non-invasive” biopsy method, imaging 1-2 mm into tissue using near-infra-red light. We present results from a comprehensive ex vivo human laryngeal dataset acquired using two desktop OCT systems, as a preliminary step in producing an OCT-endoscope for in vivo human laryngeal cancer screening.

**Method:** Thirteen formalin-fixed specimens were obtained from a single post-laryngectomy specimen; mucosal tissue sampled from various laryngeal sub-sites. OCT systems operating at 850nm (Fourier domain principle) and 1300nm (Time domain principle equipped with dynamic focus) were used to image each specimen. Longitudinal (B-scan) images were acquired with both systems and en face (C-scan) images with the 1300nm system. 3-D OCT image datasets were reconstructed with multiple frames captured to separate electronic noise from speckle. Specimens were then processed in paraffin wax, sectioned and prepared using standard histopathological techniques (hematoxylin and eosin stains).

**Results:** Correlation between histology and OCT images shall be presented. Results from previous similar ex vivo studies in various tissues indicate that useful histological information may be extracted from OCT imagery allowing identification of the epithelial layer, lamina propria and sub-epithelial glandular structures and vessels. The 1300nm system provides high transversal resolution with relatively low acquisition time.

**Conclusion:** The production of an ex vivo OCT dataset to provide a comprehensive baseline for histological correlation in the larynx is presented. This is a first step in allowing us to produce a clinically useful OCT-endoscope for in vivo human laryngeal cancer screening.

## Narrow band imaging improves preoperative fluorescence assessment of upper and lower airways in head and neck cancer patients

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**Background:** Autofluorescence (AF) has been used to improve the detection of preneoplastic lesions of the bronchus and the head and neck (H&N). It is known to have a high false positive rate. Narrow band imaging (NBI) has better specificity but poorer sensitivity. We hypothesised that combined AF and NBI inspection would improve overall specificity without impacting sensitivity.

**Objective:** To detect additional lesions to the primary H&N cancer and to determine how these impacted on overall management.

**Method:** H&N cancer patients had white light (WL), AF and NBI inspection of the upper aerodigestive tract and bronchus. Findings were reported as per established scoring systems and lesions considered abnormal by any imaging modality were biopsied. Lesions of moderate dysplasia or worse were considered significant for statistical analysis.

**Results:** 74 patients were recruited. In the H&N region 33 known primary squamous cell carcinomas were detected and were excluded from final analysis. In the H&N 22/35 detected lesions were significant. The sensitivities and specificities respectively were: WL 0.32 & 0.92; AF 0.95 & 0.15; NBI 0.95 & 0.77. In the tracheobronchial tree 17/58 detected lesions were significant. The sensitivities and specificities respectively were: WL 0.12 & 0.95; AF 0.76 & 0.51; NBI 0.88 & 0.83. 11/74 (15%) patients had additional findings detected by AF and NBI which impacted on definitive management.

**Conclusion:** AF and NBI inspection adds to WL evaluation in these patients. NBI improves specificity and can influence management.



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## Primary and salvage laryngectomy specimens: comparison of histopathological Features

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**Objective:** Residual or recurrent squamous cell carcinoma of the larynx following primary (chemo)radiotherapy may be treated with a total laryngectomy, external partial laryngectomy or transoral laser microsurgery. Differentiating between residual or recurrent disease and post-treatment changes is clinically challenging and can be a pitfall in partial laryngeal resections. This study was designed to compare the disease extent and histopathological features of primary laryngectomy specimens with those obtained from salvage surgery and to compare with published data.

**Method:** All laryngectomies performed over the ten year period 2000 – 2009 were identified and divided into 'primary surgery' or 'salvage surgery' groups based on whether (chemo)radiotherapy had been the primary treatment modality. All the pathological specimens were retrieved and assessed independently by two histopathologists for the following features: extent of tumour spread, multifocal tumour deposits, a discohesive invasive tumour front and evidence of perineural or lymphovascular invasion.

**Results:** 36 patients were identified: 17 salvage surgery and 19 primary surgery. Demographics were similar. There were significantly more specimens with a discohesive tumour front in the salvage group ( $p < 0.05$ ) and a trend towards more multifocal disease. When these results are pooled with a previous study (Zbaren et al, 2007) the differences between the groups are statistically highly significant.

**Conclusion:** This study demonstrates, and adds to published evidence, that the disease process in radio-recurrent carcinoma of the larynx may exhibit different characteristics compared to primary untreated carcinomas. These factors must be considered when selecting patients for limited resection surgery.

## Impact of anterior commissure involvement in larynx preservation in early glottic cancer treated with laser microsurgery

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**Objective:** The treatment for early glottic cancer staged involving the anterior commissure (AC) has been a controversial issue with conflicting reports regarding the best treatment modality. Surgery in the AC involved tumour is made difficult by the anatomical absence of an inner perichondrial layer and technical factors of difficult exposure and visualisation. We report on our outcomes following transoral laser microsurgical resection of early glottic cancer with respect to AC involvement over a 5-year period (2004 to 2009).

**Method:** A retrospective analysis of a prospectively maintained head and neck database was conducted on 76 patients with early glottic cancer who were treated with transoral laser microsurgical resection.

All patients treated surgically for early (Tis, T1, T2) glottic squamous cell carcinoma and available for follow-up were included for analysis. Outcome measures included rate of complications, disease recurrence, final disease status, overall survival and larynx preservation. Patients were divided for final analysis in 2 cohorts, with and without AC involvement and were compared for the likelihood of local recurrence during the follow-up period using the Kaplan-Meier method.

**Results:** The anterior commissure was involved in 30 patients (39.4%). The overall recurrence rate was 10.5% (8 patients). Within that group, 5 patients had no AC involvement at time of resection. The local control rate with AC involvement was 90% and without was 89% (Figure 1). By Fisher's exact test (1 tailed), there was no significant difference between the groups for local recurrence ( $p=0.4$ ). On multivariate analysis when other factors (tumour depth and margin status) were included for analysis, no statistically significant differences were noted between the cohorts. Absolute overall disease status at final follow up for the entire group of 75 patients was alive no disease in 74 (98.7%) with one patient lost to follow up (1.3%). There were no deaths with or without disease. The ultimate larynx preservation rate was 99% (74/75).



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**Conclusion:** Our results suggest that anterior commissure involvement in early glottic cancer may not be a significant adverse prognostic factor in terms of local control following transoral laser microsurgical resection.

## A 20-year review of primary radiotherapy for localised glottic cancer at Westmead Hospital

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**Objective:** To evaluate the experience of Westmead Hospital in Sydney, Australia in treating early glottic cancer with primary radiotherapy and the factors predicting outcome

**Method:** Retrospective analysis of patient records held in the Radiation Oncology Department of Westmead Hospital between January 1990 and January 2010 with either T1 or T2 glottic SCC who received a full course of radiation as their primary treatment.

**Results:** 145 men (94%) and 9 women (6%) received a median dose of 66 Gy (66-70 Gy) was given over a median of 33 fractions (33-35). Median follow-up period was 62 months. Age at diagnosis and time to radiotherapy were univariate predictors negatively influencing overall survival, but in multivariate analysis, (Cox model), age at diagnosis ( $p=0.001$ , 95% CI 1.025-1.109, risk ratio 1.066) and continuing to smoke post-treatment ( $p=0.034$ , 95% CI 1.069-5.248, RR 2.368) were the worst independent prognostic factors in terms of survival. In regard to recurrence, smoking ( $p=0.0365$ ) and greater than 1/3 vocal cord involvement ( $p=0.044$ ) were significant in univariate analysis, in the multivariate model, greater than one-third vocal cord involvement was significant at  $p=0.02$  when adjusted for dying of other causes and smoking.

**Conclusion:** Our local control rates using primary radiation therapy are consistent with prior published series, Age greater than 70 at the time of initial diagnosis and continuing to smoke following treatment are significant negative predictors of overall survival. Greater than 1/3 vocal cord involvement and involvement of the anterior

commissure is significant in negatively impacting time to recurrence when adjusted for smoking.

## Impact and relationship of anterior commissure and time-dose factor on the local control of T1N0 glottic cancer treated by 6 MV photons

Chi Chung, Tong, Kwok Hung, Au, Roger KC, Ngan, Foon Yiu, Cheung, Sin Ming, Chow, Yiu Tung, Fu, Joseph SK Au, Stephen CK, Law

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**Introduction:** For definitive radiotherapy, there is extensive published data regarding management of early glottis cancer (GC) with Cobalt-60 or 2-4 MV photons. The reported treatment outcome of early GC by primary RT with 6MV photons is limited. We present our institution's experience in this report.

**Method:** We retrospectively reviewed the medical records of 695 consecutive patients with T1N0 and T2N0 GC treated between 1983 and 2005 by RT in our institution. Clinical outcome in terms of local control (LC), overall survival (OS) and cause-specific survival (CSS) rate were evaluated.

**Results:** The median follow-up time was 10.5 years. The 10-year actuarial LC rates were as follows: T1A, 91%; T1B, 87%; T2, 77%. The 10-year OS were as follows: T1, 74.2%; T2, 70.7%. The 10-year CSS were as follows: T1, 97.7%; T2, 98.1%. Poorly differentiated histology and tumor biologically effective dose greater than 65 Gy<sub>15</sub> were common adverse factors in LC of T1 and T2 disease. Involvement of anterior commissure was an adverse factor in both LC and CSS of T1 disease. Subglottic extension was associated with poor LC in T2 disease whereas hemoglobin less than 13.0 was associated with poor LC and CSS of T2 disease

**Conclusion:** Poorly differentiated histology and tumor biologically effective dose greater than 65 Gy<sub>15</sub> were common adverse factors in LC of T1 and T2 disease. Involvement of anterior commissure was an adverse factor in both LC and CSS of T1 disease. Subglottic extension was associated with poor LC in T2 disease whereas hemoglobin less than 13.0 was associated with poor LC and CSS of T2 disease.



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## Poster Presentations

### Objective and subjective changes in voice quality after radiotherapy for early (T1 or T2, N0) laryngeal cancer - A pilot prospective cohort study

Gerard Adams<sup>1</sup>, Robyn Burnett<sup>2</sup>, Ellen Mills<sup>2</sup>, Michael Penniment<sup>1</sup>

*1Radiation Oncology Department; 2Speech Pathology Department, Royal Adelaide Hospital, Adelaide, South Australia, Australia*

**Objective:** A study evaluating the predictive accuracy and added value from a standardised objective assessment of voice quality in patients undergoing radiotherapy for early laryngeal cancer.

**Method:** From June 1999-December 2005 the study was offered to all suitable patients. A battery of functional tests was performed prior to treatment and at specific points during the following two years. We report the results of the subjective - Voice Handicap Index (VHI) questionnaires; and objective - Oates and Russell's Perceptual Voice Profile (PVP) tests.

**Results:** Sufficient data were available for 15 patients. Analysed median test scores at two years improved from 35→6 ( $p=0.0485$ ) and from 30→18 ( $p=0.0212$ ) for VHI and PVP scores respectively. Analysis of subgroups (poor initial voice; good initial voice; smoker; non-smoker; stage 1a; stage 1b or 2), showed that median scores improved in all subgroups for both tests. However in this small cohort this only reached statistical significance in the subgroups with poor initial voice or more advanced disease. Individual patient subjective and objective scores correlated moderately well at baseline ( $r=0.64$ ,  $p=0.01$ ). This correlation diminished at later time points ( $r=0.15$ ,  $p=0.67$ ; 12 months).

**Conclusion:** There are both subjective and objective improvements in voice after radiotherapy for early laryngeal cancer which persists for at least two years.

A larger prospective study will be beneficial in discussing outcomes and managing patients with localised larynx cancers in the future. Similar principles should be applied to surgical management.

### Emerging understanding of dosimetric parameters and the impact of dysphagia post-radiotherapy

Bena Cartmill

*University of Queensland and Princess Alexandra Hospital, Brisbane, Queensland, Australia*

**Objective:** Radiotherapy treatment parameters for head and neck cancer continue to be refined and improved. Recent approaches aim to improve locoregional control, survival and long-term morbidity. Swallowing dysfunction has been found in 30-50% of patients treated with intensive non-surgical regimens. Determining which patients will develop swallowing dysfunction remains unclear. This paper aims to review the evidence base to determine whether an association exists between dysphagia post-treatment and dosimetric parameters of radiotherapy.

**Method:** Studies examining dose-volume parameters and specific dysphagia endpoints were reviewed. Papers examining xerostomia outcomes were excluded.

**Results:** Sixteen papers were eligible for inclusion in this review. Cohorts examined were either heterogenous ( $n=10$ ) or oropharyngeal ( $n=6$ ) and received intensive non-surgical chemo-IMRT. Various swallowing endpoints were used and included dysphagia toxicity ( $n=10$ ), aspiration ( $n=8$ ), physiological impairment ( $n=6$ ), stricture ( $n=6$ ), alternative feeding ( $n=11$ ), and patient-reported dysphagia/ quality of life ( $n=11$ ). Six papers reported dose-volume thresholds to structures to reduce the above dysphagia endpoints ranging from 49-66Gy to the pharyngeal constrictors, 40-60Gy to the larynx, and 58-60Gy to the upper esophageal sphincter (UES). Partial doses between 35 and 70Gy have also been reported for the pharyngeal constrictors, larynx, and UES.

**Conclusion:** Radiotherapy dose to structures critical for swallowing has been recently investigated by several authors with the aim to determine clinical guidelines to spare function. No clear consensus regarding mean or partial doses to the pharyngeal constrictors, larynx or UES/ cricopharyngeus to reduce dysphagia risk have been determined.



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## **Incidence and outcome of fluorodeoxyglucose-positron emission tomography (FDG-PET) scan detected incidental thyroid lesions**

Adrian Tang<sup>1</sup>, Haim Gavriel<sup>1</sup>, Rodney Hicks<sup>2</sup>, Elizabeth Drummond<sup>2</sup>, Sor Way Chan<sup>1</sup>, Michael Henderson<sup>1</sup>

*1Peter MacCallum Cancer Center Division of Surgical Oncology; 2Peter MacCallum Cancer Center PET Center, Melbourne, Victoria, Australia.*

**Objective:** To identify the incidence and outcome of incidental FDG-PET detected thyroid lesions in patients undergoing FDG-PET scan for other primary malignancies.

**Method:** Retrospective review of patients who had a FDG-PET detected incidental thyroid lesion between January 2002 and December 2009, identified from the Peter MacCallum PET Center imaging database. Patients were eligible for this study if they were scanned for non-thyroid primary malignancy, there was unequivocal incidental thyroid uptake and had further workup.

**Results:** 48 patients were identified, 19 males and 29 females. Mean age 60 years (25 – 81). 16 had pre-PET radiotherapy. 13 had pre-PET chemotherapy. 3 patients had a history of benign thyroid disease (no previous surgery). FNA results included 14 benign, 2 metastatic, 11 atypical, 12 malignant and 9 insufficient material. Of the 9 patients with an insufficient result, 3 underwent thyroidectomy (all malignant). 9 of 12 patients with a malignant FNA had a thyroidectomy (all malignant) and of the 11 with an atypical result, 6 underwent thyroidectomy (4 malignant). Median size of the 16 primary thyroid malignancies was 15mm (2-55mm) and 11 were 10 mm or larger. 1 patient with benign FNA underwent a thyroidectomy (no malignancy). Of the 48 patients, 19 had a diagnosis of malignancy (surgery and/or FNA) and 19 patients underwent thyroidectomy.

**Conclusion:** FDG-PET scanning in patients with non-thyroid malignancies identifies a small proportion with incidental thyroid uptake. However, these cases will need further investigation as 40% will have an occult thyroid malignancy.

## **The process and complications of setting up a head and neck database**

Katie J De-loyde, Robert Smee

*Department of Radiation Oncology, Prince of Wales Hospital, Randwick, New South Wales, Australia*

**Objective:** To improve data collection by examining the complications of creating databases for oncology research.

**Method:** Since 1990, data regarding patient, disease and treatment demographics have been collected, analysed and published by the Prince of Wales Hospital (POWH) Radiation Oncology department. There are currently nine Head and Neck Ethics approved databases containing data on >4500 patients. It is the intention to merge several of these databases over the next few years creating a database with >1500 variables.

Research applications of these databases vary broadly however there are complications that need to be considered to ensure good practice and accurate data collection.

**Results:** Coordinating large numbers of medical/allied health staff to create a valid and reliable data collection tool can be overwhelming. Whilst extremely time-consuming this is a critical part of data collection. If the data collection tool is unreliable the study will fail before it has even begun.

Although quantitative data is often more suitable for statistical analysis there is a tendency to collect large amounts of descriptive/qualitative values/variables when quantitative would be more appropriate. Oppositely confounding factors can be over-looked, or worse, included but poorly measured.

Other complications include poor documentation/record keeping and inconsistent reporting by staff. A lack of time and/or understanding of research can exasperate all these issues.

**Conclusion:** Although progress has been made on many methodological issues related to healthcare databases in recent years<sup>1</sup>, problems still persist and merit scrutiny.



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Careful planning and preparation of a project prior to data collection determines whether it is a success or not.

## Care coordination in head and neck oncology

Maria Dikeakos

*Royal Melbourne Hospital, Melbourne, Victoria, Australia.*

**Objective:** Cancer Care Coordination (CCC) is a developing area of supportive care for patients during their cancer journey. The aim of this presentation is to demonstrate the need for cancer care coordination for Head & Neck patients.

**Method:** The scope of the project was to develop 4 primary areas: multidisciplinary care, care coordination, reduction in variations in care and psychosocial/supportive care, which are central to high quality cancer care. Each area was investigated and changes were then managed and introduced to the Tumour Stream. The Royal Melbourne Hospital accepts approximately 170 new Head & Neck cancer patients per year.

**Results:** At the Royal Melbourne Hospital, the CCC is consulted regarding aspects of the patient's ongoing care and coordination, and plays a lead role in patient coordination. The role is involved with the patient, their carer/family, and the medical and surgical teams to facilitate the patient's journey through aspects of their cancer care.

**Conclusion:** The CCC participates in the patients and carers wellbeing from referral to the Head & Neck Oncology clinic and continues during all treatments surgical treatment, adjuvant radiation and chemotherapy, through to the follow up and surveillance phase. The CCC has become the primary contact point within the Head & Neck Tumour Stream for the patient, their families/carers as well as an essential resource for staff. The CCC is now an integral part of the Head & Neck Multidisciplinary team.

## Is routine panendoscopy indicated in patients with a PET-scan negative for synchronous aerodigestive malignancy?

Kristy Fraser-Kirk

*Royal Brisbane and Women's Hospital; Princess Alexandra Hospital, Brisbane, Queensland, Australia*

**Objective:** To compare the incidence of synchronous aerodigestive malignancy detected by FDG-PET/CT with those detected during panendoscopy – to assess the additional diagnostic yield of panendoscopy in those patients with a staging FDG-PET/CT that is negative for synchronous disease.

**Methods:** Retrospective chart audit of all patients presenting to the Royal Brisbane and Women's Hospital and Princess Alexandra Hospital between January 2005 – January 2011 who underwent both FDG-PET/CT and panendoscopy during staging for newly diagnosed HNSCC was undertaken. Incidence data for synchronous primary lesions of the aerodigestive tract was correlated between the Queensland PET Service Nuclear Medicine database, ORMIS operative database, AUSLAB histology database and PACS radiology database.

**Results:** Of 331 patients, FDG-PET/CT detected 21 lesions in 17 patients suspicious for synchronous aerodigestive malignancy. Of these, histological evaluation proved 15 to be non-malignant false positives. Six were confirmed to be malignant synchronous primaries. Of the remaining 314 patients deemed by staging FDG-PET/CT to be negative for synchronous disease, an additional vocal cord SCC was detected on panendoscopy in one patient.

**Conclusion:** The incidence of synchronous malignancies missed by PET but detected by panendoscopy is sufficiently low to prompt scrutiny of the routine use of panendoscopy in centres where FDG-PET/CT is readily available. Further prospective research is required to determine if tumour assessment may be limited to examination and biopsy of the primary and adjacent subsites – which, with advances in flexible video-nasendoscopic technology may increasingly be performed in a clinic setting. This approach may allow formal "triple endoscopy" under a general anaesthetic to be reserved for patients whose primary tumours cannot be evaluated adequately without triple endoscopy, who are symptomatic or especially high risk for synchronous malignancy, or



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who cannot tolerate adequate aerodigestive assessment and instrumentation under local anaesthesia.

**Discussion:** In an era where non-invasive staging methods are becoming increasingly sensitive and available, this research aims to contribute to the evidence-basis for selecting patients for either formal panendoscopy or more limited tumour evaluation and biopsy according to individual and tumour risk factors. This patient-tailored approach acknowledges the sensitivity of new staging technology, spares “true negative” patients without synchronous malignancy the morbidity, complication risk and inconvenience of an invasive procedure and hospital admission, and secondarily, may alleviate the healthcare system of a significant cost burden.

## Communication and swallowing functional outcomes in head and neck oncology patients: development and implementation of a prospective database

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**Objectives:** Research into treatment outcomes in the head and neck population has traditionally focused on disease cure and survival. In 2010 a prospective database on the communication and swallowing functional outcomes of patients treated for head and neck cancer was established. It was developed to complement existing databases at the Prince of Wales Hospital and identify patterns and predictors of communication and swallowing function post treatment.

**Methods:** The data collection process was designed to have minimal interference with clinical care and was subsequently categorised by the board of ethics as low or negligible risk. Participants include consenting patients receiving head and neck cancer treatment at the Prince of Wales Hospital seen by speech pathology. International patients and those having previously undergone head and neck cancer treatment prior to recruitment have been excluded.

Variables were selected to capture function at various stages of treatment for head and neck cancer. Challenges encountered include:

- Drawing from limited available validated outcome measurement tools specific to this population;
- Managing practical issues of long term prospective data collection (eg. numerous variables, administration time and methods);
- Determining meaningful yet realistic data collection points;
- Ensuring that variables are applicable to all participants.

**Results:** Preliminary findings indicate that the outcome measures selected for this database are effective in providing information about function and recovery of swallowing and communication during and post treatment.

**Conclusions:** The current goals for this database are to continue with longitudinal data collection and to commence analysis to benefit and inform clinic practice.

## Prosthetic voice rehabilitation: Provox Vega voice prosthesis and review of device life and complications

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<sup>1</sup>Princess Alexandra Hospital; <sup>2</sup>Centre for Functioning and Health Research, Queensland Health, The University of Queensland, School of Health & Rehabilitation Sciences, Brisbane, Queensland, Australia

**Objective:** The Provox Vega is a new indwelling voice prosthesis. Preliminary results relating to device life, reasons for replacement and complications were presented at ANZHNS annual 2010. Final results are now available and will be outlined in the poster. Device life and complications are important for the Australian health care system and results will contribute to consideration of the effectiveness of this device in this health context. A review of the literature sees a wide variety of device life depending upon device type and region however to the authors knowledge no study has considered the long term device life of the indwelling voice prosthesis in Australia.

**Method:** Twenty two laryngectomy patients at the Princess Alexandra Hospital using the Provox Vega voice prosthesis were followed over the last two and half years. Device life duration has been analysed in terms of initial device life, number of devices used within a 12 month period and average of first



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two to three devices. Analysis of reasons for replacements and complications were undertaken for all devices used during this time period.

**Results:** Initial device life patterns indicate 75% of participants continuing with the first device at 3mths, 55% at 6mths and 25% at 12months. Eighty percent (80%) required only one or two indwelling devices within the first 12months. Reasons for device life failure or replacement were leakage via the prosthesis (85%), increase speaking effort (5%), or routine change at 12 month. Average device life has been compared to pre trial device life patterns in 65% of patients. The remaining 35% either used standard voice prosthesis alone or had unavailable data.

**Conclusion:** Results indicate that device life of the Provox Vega presents as a favourable device in the Australian context and is comparable to other indwelling devices reported in the literature.

## **Favourable therapeutic ratio for Intensity Modulated Radiotherapy (IMRT) compares to 3-D Conformal Radiotherapy (3D-CRT) for bilateral parotid glands and necks.**

Eric LH Khoo, Mark Jones

Radiation Oncology Queensland, Toowoomba, Queensland, Australia

**Objective:** This study compares the dosimetry between IMRT and 3D-CRT for bilateral parotids and necks

**Method:** PTV 64Gy, PTV 60Gy and PTV 56Gy all in 30 fractions treated with IMRT technique. A 3D-CRT technique was planned retrospectively with the same prescribed dose. Critical organs were delineated. Data from DVH regarding the min, max and mean dose were analysed.

**Results:** The mean dose to PTV64, PTV 60 and PTV 56 were comparable between IMRT and 3D-CRT technique. The mean dose to the oral cavity, pharyngeal constrictor, brachial plexus, thyroid and mandible were lower for IMRT than 3D-CRT by 2.7Gy (9%), 4.4Gy (13%), 2.1Gy (4%), 2.6Gy (4.9%) and 1.4Gy (2.9%), respectively. The mean dose to spinal cord and right inner ear are higher with IMRT than 3D-CRT by 5.4Gy (22%), and 9.5Gy (33%), respectively.

**Conclusion:** Bilateral parotid glands and necks irradiation poses challenges in radiation planning. Good 3D conformal technique can achieve

dosimetry close to IMRT. Despite the vastly different shape of these PTVs compared to the PTVs of the pharyngeal cancer, IMRT remains superior in critical organs sparing without compromising PTVs coverage. All critical organs except spinal cord and inner ear received a lower mean dose compares to 3D-CRT. The mean dose for spinal cord and inner ear were below the organ tolerance. We conclude that IMRT for bilateral parotid glands and necks has a favourable therapeutic ratio compares to 3D-CRT.

## **Early clinical experiences using a novel tracheostomy tube and applications for patients with head and neck cancer**

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<sup>1</sup>St. George Hospital, New South Wales, Australia; <sup>2</sup>Atlanta Medical Center, Georgia, USA

**Objective:** To study the safety, efficacy, tolerance and patient satisfaction of the Blom Tracheostomy Tube, Speech Cannula, Low Profile (Speaking) Valve (LPV), and Subglottic Suctioning Cannula (Pulmodyne, Indianapolis, Indiana, USA). This novel tracheostomy tube offers several different inner cannulas which allow for a) speech on a ventilator with the cuff inflated or deflated, b) speech during spontaneous breathing with the cuff inflated or deflated, and c) suctioning capability above the cuff on a disposable inner cannula.

**Method:** Data were collected across the first cohort of patients to use the Blom Tracheostomy Tube in the US and Australia. The patients had varying medical diagnoses, and utilized at least one of the Blom optional inner cannulas to allow for communication and/or subglottic suctioning. Physiologic parameters and patient satisfaction with the devices were recorded.

**Results:** Patient satisfaction and tolerance of the Speech Cannula and LPV were high during cuff inflation and deflation. The Subglottic Suction Cannula was effective in removing secretions pooled above the tracheostomy cuff. Stable physiologic parameters were maintained during use of the Blom Tracheostomy System.

**Conclusion:** The Blom Tracheostomy Tube offers options for improved secretion management via a disposable inner cannula, and verbal communication with the cuff inflated which is not available using other tracheostomy tubes. This novel device was both safe and effective when used by patients with a variety of diagnoses, and will be



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another tool for practitioners to utilize with head and neck cancer patients. Possible applications for use with this population of patients are presented.

## Interobserver variation in volume delineation in head and neck cancer radiotherapy

Kavita Morarji, Dion Forstner, Allan Fowler, Yvette Griffiths, Lois Holloway, Michael Jameson, Shivani Kumar

*Liverpool Cancer Therapy Centre, Liverpool, New South Wales, Australia*

**Objectives:** To compare inter-observer variability in contouring of head and neck cancer and to assess the impact of level of experience in voluming

**Methods:** Five radiation oncologists and three radiation oncology registrars contoured five cases of head and neck cancer, with a range of primary sites and stages. Three to five volumes were contoured, namely GTVprimary, GTVnodes, CTV70, CTV62 (if involved nodes) and CTV54. A detailed contouring protocol was provided. The planning CT scan was fused with an FDG PET/CT scan. Concordance index was used to compare each volume to that of a consensus reference volume. Volumes of the two senior head and neck cancer radiation oncologists were used to create this consensus volume.

**Results:** There was substantial inter-observer variation in volume delineation with a concordance index of 57.4 (95% confidence interval [CI]: 51.6-63.1) for GTVprimary, 58.2 (95% CI: 54.0-62.5) for CTV54, and 69.9 (95% CI: 66.0-73.8) for CTV70. The level of experience of the observer did not have a significant impact on the concordance index, with the concordance index for GTVprimary being 49.6 (95% CI: 40.7-58.6) for registrars as compared to 54.6 (95% CI: 48.0-61.1) for junior consultants ( $p=0.35$ ).

**Conclusions:** There is considerable inter-observer variability in delineation in radiotherapy planning for head and neck cancer. Participants' concordance with the reference radiation oncologist does not appear to be affected by the level of experience. Incorporation of tools such as a contouring protocol into the radiotherapy planning process may aid in improving the accuracy of delineation of head and neck cancers be affected by the level of experience. Incorporation of tools such as a contouring protocol into the radiotherapy planning process may aid in improving the accuracy of delineation of head and neck cancers.

## Isolated primary maxillary sinus esthesioneuroblastoma: Case series and discussion of endoscopic verses open approaches

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**Objective:** Esthesioneuroblastoma is an uncommon tumor thought to originate from the neural crest cells of the upper nasal cavity. Primary presentation within the maxillary sinus is exceedingly rare with 4 reported cases in the literature. We present our institution's experience with this condition and discuss the endoscopic and open approaches used.

**Method:** We report 2 cases presenting with primary maxillary sinus esthesioneuroblastoma. Both underwent surgical resection with adjuvant radiotherapy. In one case, an open approach was used and in the other, an endoscopic approach.

**Results:** Case 1: 28 year old female. Dulgerov stage T1N0M0, Hyams grade 1 right maxillary esthesioneuroblastoma, pedunculated lesion arising from medial maxillary roof. Extended lateral rhinotomy approach with medial maxillectomy. Adjuvant radiotherapy – 54Gy IMRT given. Disease free at 30 months.

Case 2: 17 year old female. Dulgerov stage T1N0M0, Hyams grade 1 right maxillary esthesioneuroblastoma, pedunculated lesion arising from medial maxillary roof. Presented with SIADH. Endoscopic approach with medial maxillectomy. Adjuvant radiotherapy – 50Gy IMRT Sodium normalized post-resection. Disease free at 3 months.

**Conclusion:** Esthesioneuroblastoma is traditionally treated with cranio-facial resection. Primary maxillary involvement requires an alternative technique. Open or endoscopic approaches may be used and appear equally efficacious.



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## Malignant peripheral nerve sheath tumour of paranasal sinuses

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Malignant Peripheral Nerve Sheath Tumour is an aggressive soft tissue malignancy arising from a peripheral nerve or showing nerve sheath differentiation. The tumour is a rare entity in head and neck, with reported poor prognosis and high recurrence rate. To our knowledge, there have been only few reported cases in the western medical literature. Therefore, little information is available to assist clinicians identify the best diagnostic, prognostic and treatment modalities for such cases. Most patients present with headache and nasal mass. Both our reported cases were diagnosed following endoscopic biopsy. The tumour was excised en bloc and successfully with cranio-facial approach. Further careful histological analysis, confirmed the true nature of the tumours as a high grade Malignant Peripheral Nerve Sheath Tumour. Therefore, both patients received planned adjuvant radio-therapy delivered via an IMRT approach. To this date, both patients outlive their predicted disease free survival and remain disease free on the regular follow ups scheduled. We will discuss and explore the published literature on the subject of Malignant Peripheral Nerve Sheath Tumours of the nasal and paranasal sinuses. We particularly emphasize the importance of correct diagnosis and complete surgical excision in the management of this aggressive neoplasm. Finally we will look at reported prognostic factors and their relevance in considering adjuvant chemoradiation.

## Comparison of surgeon performed ultrasound guided fine needle aspiration biopsy of thyroid nodules to other proceduralists

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**Background:** Thyroid nodules are common. Fine needle aspiration biopsy (FNAB) has proven to be a valuable tool in cytopathological evaluation of thyroid nodules. Historically USG FNAB has been the domain of the radiologist. More recently, this

procedure has been undertaken by endocrinologists, ENT and head and neck surgeons. With the advent of portable ultrasound (USG), this can now be performed in office by the consulting surgeon, streamlining patient management.

**Objective:** To compare the accuracy and specimen adequacy of thyroid FNAB performed in consulting rooms under USG, by a single surgeon operator in a subspecialty endocrine unit to the quoted radiological, endocrinology and ENT literature.

**Method:** A literature review of FNAB results obtained by radiologists, endocrinologists and ENT surgeons was performed. This was compared to the data from a retrospective case review of 120 patients who underwent USG FNAB of the thyroid between 2008 and 2011 in the office of one endocrine surgeon.

**Results:** A total of 120 patients underwent thyroid USG FNAB. 144 FNAs were sampled. The diagnostic rate of surgeon performed US FNAB was 90%. 9% were malignant. There were no complications.

**Conclusion:** This study demonstrates that an endocrine surgeon can perform USG thyroid FNAB in the clinical consulting setting with results comparable to the radiology, endocrine and ENT literature. This can allow greater efficiency in streamlining patient care for earlier accurate diagnosis, fewer health care visits and curtailing patient waiting time for definitive therapy. We propose this should be part of the initial consultation work up of patients presenting with thyroid nodules.

## Hunsaker Mon jet ventilation: A modified technique in microlaryngeal laser surgery for cancer

V Sivapathasingam<sup>1</sup>, T Stewart<sup>1</sup>, S Satchi<sup>2</sup>, John McGuinness<sup>1</sup>

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**Introduction:** Methods of delivering and maintaining anaesthesia whilst obtaining optimal laryngeal exposure are a principal concern in micro laryngeal surgery. In 1994, the Hunsaker Mon Jet Ventilation tube (HMJ) was introduced as a self-centering, laser-safe subglottic ventilation tool. It has since been established as a safe and effective method of providing laryngeal exposure. However, it is often during the transition period between non-



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invasive mask ventilation and laryngoscopic confirmed jet ventilation that presents the greatest opportunity for loss of the airway and its resultant stresses.

**Objective:** We describe a modified technique of subglottic ventilation that uses a laryngeal mask airway (LMA) as an adjunct to subglottic ventilation in microlaryngeal surgery for glottic lesions. This study examines the efficacy as well as the ease in maintaining a controlled airway throughout the procedure.

**Method:** Retrospective analysis of all microlaryngoscopic laser procedures undertaken using subglottic jet ventilation during the period of June 08 to Jul 11 at our institution was performed. 27 laser procedures using the LMA-HMJ method were identified out of a total 73 microlaryngoscopic procedures during this period. All operations were conducted by the same surgeon and anaesthetist. LMA-HMJ ventilation method was used irrespective of patient's Mallampati or ASA score. 3 laser procedures were excluded from this method on the basis of severe emphysematous pulmonary disease, obesity and severe gastroesophageal reflux.

The technique - is divided into the Induction, Operative and Recovery phases. During the induction phase, the patient is intubated with the HMJ tube under direct laryngoscopic vision by the anaesthetist. The LMA is then placed "on top" of the HMJ and the patient is pressure ventilated through it, until the surgical setup is ready and the subglottic placement of HMJ tube is confirmed by the surgeon. During the recovery phase, the LMA is replaced, and the patient is recovered with the LMA in place.

**Results:** In combination with the Hunsaker Mon Jet subglottic ventilation tube, the LMA was used in 27 cases. The majority of cases involved laser resection of glottic and supraglottic tumours (70%), of predominately T1 staging. We discuss parameters such as maintenance of O<sub>2</sub>, end tidal Co<sub>2</sub>, PaCO<sub>2</sub>, duration of procedures, need for endotracheal intubation, and complications. Surgeon and Anaesthetist assessment of smoothness of procedure is qualitatively assessed.

**Conclusion:** In our experience, the adjunct of LMA has distinct advantages for the surgeon and the anaesthetist for maintaining a controlled airway during all phases of the procedure. This is particularly pertinent in laser laryngeal microsurgery when the amount and complexity of equipment that needs to be available prolongs this transition period.

## Supraglottic carcinoma

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**Objective:** With rich lymphatic pathways Supraglottic Laryngeal Carcinoma-(SLC) typically presents with more advanced disease. This is an audit of a single centre's experience in managing this malignancy.

**Method:** This Ethics approved Larynx Cancer Database (1,582 patients) was audited for all patients with a squamous cell carcinoma originating in the Supraglottic larynx having definitive treatment at POW Cancer Centre and follow-up > 2years. Specific characteristics re this population were grouped-patient, disease and treatment related variables. Primary end-point was ultimate local-control/regional control, secondary end-point was cancer-specific survival-CSS. Follow-up data was captured from this database plus involved clinicians and the Death Registry. All data was entered into SPSS with statistical evaluation using Kaplan-Meier actuarial evaluation.

**Results:** Between 1967 and 2008 there were 369 eligible patients, males-303 (82%), females-66 (18%), with 92% having a background of smoking, median age-62 (34-89 yrs). 30 patients (8%) had a history of prior malignancy. 309 patients (83.7%) were fit for major surgery, 76% were ECOG 0-1. Clinical stages were 1-55 (15%), 2-68 (18%), 3-135 (37%), 4-107 (29%). Surgery only was used in 30 patients (8%), radiotherapy only in 217 (59%), and surgery +/- radiotherapy in 33%. Initial local-control was 90% in patients receiving surgery +/- radiotherapy, 59% in radiotherapy only. Salvage ultimate-local control for patients treated by radiotherapy was 72%. Patients unfit for surgery had worse local-control. CSS-70% for patients having surgery + radiotherapy, 60% where radiotherapy upfront used. There has been no improvement in recent years.

**Conclusion:** For this population radiotherapy only had only modest local-control rate. Influencing this could be the significant proportion of unwell and unfit patients.



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## Definitive radiotherapy with 6 MV photons for early glottic cancer

Chi Chung, Tong, Kwok Hung, Au, Roger KC, Ngan, Foon Yiu, Cheung, Sin Ming, Chow, Yiu Tung, Fu, Joseph SK, Au, Stephen CK, Law

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**Introduction:** For definitive radiotherapy, there is extensive published data regarding management of early glottis cancer (GC) with Cobalt-60 or 2-4 MV photons. The reported treatment outcome of early GC by primary RT with 6MV photons is limited. We present our institution's experience in this report.

**Method:** We retrospectively reviewed the medical records of 695 consecutive patients with T1N0 and T2N0 GC treated between 1983 and 2005 by RT in our institution. Clinical outcome in terms of local control (LC), overall survival (OS) and cause-specific survival (CSS) rate were evaluated.

**Results:** The median follow-up time was 10.5 years. The 10-year actuarial LC rates were as follows: T1A, 91%; T1B, 87%; T2, 77%. The 10-year OS were as follows: T1, 74.2%; T2, 70.7%. The 10-year CSS were as follows: T1, 97.7%; T2, 98.1%. Poorly differentiated histology and tumor biologically effective dose greater than 65 Gy15 were common adverse factors in LC of T1 and T2 disease. Involvement of anterior commissure was an adverse factor in both LC and CSS of T1 disease. Subglottic extension was associated with poor LC in T2 disease whereas hemoglobin less than 13.0 was associated with poor LC and CSS of T2 disease

**Conclusion:** Poorly differentiated histology and tumor biologically effective dose greater than 65 Gy15 were common adverse factors in LC of T1 and T2 disease. Involvement of anterior commissure was an adverse factor in both LC and CSS of T1 disease. Subglottic extension was associated with poor LC in T2 disease whereas hemoglobin less than 13.0 was associated with poor LC and CSS of T2 disease.

## Reducing radiation induced buccal mucositis in head and neck cancer patients

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**Objective:** Radiation-induced buccal mucositis is a common side effect for head and neck cancer

patients and often decreases the quality of life of the patients. IMRT has the advantage of dose painting and the potential to reduce the total volume irradiated, thus reducing the buccal mucositis. In our centre, a mean dose of less than 30Gy to the buccal mucosa was selected to limit the severity of the mucositis. The purpose of the study is to report our data on the use of a dose constraint on the buccal mucosa and the incidence and severity of buccal mucosa in patients receiving IMRT for head and neck cancers.

**Method:** 15 patients with T3-4N2-3M0 nasopharyngeal carcinoma who were treated with IMRT were assessed. The prescribed dose was 6996cGy in 33 fractions on PTV 1, 6600cGy and PTV2 and 6000cGy on PTV3. PTV planning objectives were as used in the RTOG 0615 protocol. Mucositis was scored using RTOG oral mucositis assessment scale.

**Results:** The mean dose delivered to the buccal mucosa for the 15 patients was 29 Gy (range, 28 Gy – 30 Gy). 3 patients have grade 0 (20%); 10 with grade 1 (66.7 %) and 2 patients with grade 2 (13.3 %). No patients suffered more than grade 3 mucositis.

**Conclusion:** By allocating a dose constraint to the buccal mucosa (mean dose of less than 30Gy) may reduce the incidence and severity of buccal mucositis.

## The importance of a multidisciplinary approach for diagnosis and management of Ferguson-Smith disease: A patient's twenty-four year journey to diagnosis

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**Objective:** Ferguson-Smith disease is a rare autosomal dominant disorder characterized by the appearance of multiple keratocanthomas mostly on the head, which slowly involute and periodically reappear. Most affected individuals are of Scottish ancestry. These lesions can histologically resemble squamous cell carcinomas. Mutations in the TGFβ-R1 gene have recently been identified for this disease. Our patient, a 60-year-old female of Scottish ancestry, was diagnosed with recurrent squamous cell carcinomas involving the lip and



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perioral areas. She and her daughter were identified as carriers of a mutation in the TGF $\beta$ -R1 gene linked to Ferguson-Smith disease. We aim to illustrate the importance of a multidisciplinary approach for diagnosing and treating this disease.

**Method:** Data was collected from the patient's medical records including histopathology reports.

**Results:** Over the past twenty-four years, our patient had multiple lesions in the lip and perioral areas clinically suspicious for keratocanthomas but histologically diagnosed as squamous cell carcinomas. She was subsequently treated with a combination of surgery and radiotherapy. In 2010, our patient and her daughter were identified as being carriers for a mutation (p.R80X) in the TGF $\beta$ -R1 gene associated with Ferguson-Smith disease.

**Conclusion:** If this diagnosis had been made earlier, our patient would likely have not undergone extensive radiotherapy causing her significant disfigurement that warranted extensive reconstructive surgery. Any suspicion of recurrent keratocanthomas or squamous cell carcinomas particularly in familial patterns and in patients of Scottish ancestry should be discussed closely between specialists including surgeons, pathologists, dermatologists, geneticists, and oncologists.

## Is Hashimoto's thyroiditis a risk factor for papillary thyroid cancer? A retrospective study of consecutive cases in a Singapore tertiary referral centre

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**Objective:** The association between Hashimoto's thyroiditis and papillary thyroid carcinoma (PTC) remains controversial. The objective of this study was to determine the prevalence of pre-existing Hashimoto's thyroiditis in patients with PTC in a tertiary referral centre in Singapore.

**Method:** A retrospective review of consecutive cases of papillary thyroid carcinoma treated at Tan Tock Seng Hospital since January 2005 was performed. A systematic review of the literature was also performed.

**Results:** 113 cases of papillary thyroid carcinoma were identified. There were 5 (4.4%) cases of established Hashimoto's thyroiditis and a further 16 cases of patients with chronic lymphocytic thyroiditis, therefore 21 (18.6%) cases associated with pre-existing inflammation. There was no relationship between pre-operative TSH level and maximum diameter of the tumour or PTC stage.

**Conclusion:** The prevalence of Hashimoto's thyroiditis was low in our series, however the rate of pre-existing chronic inflammation in PTC was similar to published data. We suggest that the follow-up of patients with Hashimoto's thyroiditis for subsequent cancer development is unnecessary in our population, but that the hypothesis that preceding chronic inflammation of the thyroid is a cause of subsequent carcinogenesis is plausible.

## Head and neck cancer among adult acute epiglottitis in Singapore

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**Objective:** To examine the incidence, clinical presentations, management and treatment outcomes of adult with a history of head and neck cancer with or without radiotherapy presenting with acute epiglottitis in Singapore.

**Method:** A retrospective study was undertaken in all adult patients admitted to a tertiary teaching hospital otorhinolaryngology department (year 2006 to 2010) with acute epiglottitis and a history of head and neck cancer, compared against those without cancer.

**Results:** A total of 78 patients with acute epiglottitis were identified. Eleven (14.1%) cases had a previous history of radiotherapy for nasopharyngeal carcinoma (n=8), laryngeal carcinoma (n=1), olfactory neuroblastoma (n=1) and lung cancer (n=1). The mean age was 54.5 (38.8-63.0). Two (25%) of the patients with previous radiotherapy had multiple recurrences of acute epiglottitis. The most common symptoms presented in cancer patients were sore throat (81.8%), voice change (63.6%) and odynophagia (54.5%). This is only slightly different from non-cancer patients (sore throat 80.6%, odynophagia 64.2% and fever 53.7%). Between the two groups, there is no significant difference in gender ratio, duration of symptoms



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before hospital presentation, hospitalisation duration, and airway intubation rate.

**Conclusion:** The outcome of patients with a history of head and neck cancer presented with acute epiglottitis did not show significant difference in outcome compared to patients without cancer.

## **Schwannoma of the tongue: Case report and review**

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**Introduction:** The aim of this study was to report two cases of a tongue schwannoma with its clinicopathologic and radiographic imaging and to review the literatures of this rare benign tumor.

**Method:** The English medical literature in PubMed was searched for articles from 1996 to 2009. The cases providing surgical approach, sex, age, location of the masses, size and imaging modalities were accepted for the review.

**Results:** Of the 67 cases reported in English literature after 1996, full-text document of 48 cases could be reached and 42 of them were providing all criteria. The average age was 27.21 (range 7-77 years). There was no difference in sex prevalence (24 male, 18 female). Location of the 42 cases were 9 at the tip, 10 at the base, 15 at the left or right side, 7 at the ventral surface and 1 at the sublingual surface of the tongue.

**Discussion:** Our cases were two young men with the tongue mass underwent an operation with an intraoral approach for diagnosis and treatment. Histopathologic examinations were consistent with a schwannoma. Minor salivary gland tumors, neuroma, adenoma, leiomyoma, and malignant tumors as well as schwannoma should be considered for the differential diagnosis of a mass at the tip of the tongue.

## **Paranasal sinus extranodal nasal-type natural killer/T-cell lymphoma**

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Natural Killer cell lymphomas are defined as angiocentric lymphomas in the revised European American Lymphoma (R.E.A.L.) classification. It is associated with the Epstein-Barr virus (EBV) and its response to treatment and prognosis are usually very poor. Here we present a 61 years old, male patient with paranasal sinus NK-T cell lymphoma. Paranasal sinus biopsy revealed malign lymphoid infiltration at posterior side of nasal cavity. Immunohistochemistry staining was found to be positive for Epstein-Barr virus early RNA and the diagnosis was extra nodal NK-T cell lymphoma, nasal type. There was no involvement in bone marrow biopsy. The patient had B symptoms. No intracranial extension was detected. After 3 cycles of CHOP (cyclophosphamide, doxorubicin, vincristine, and prednisolone) chemotherapy, there was apparent progression on paranasal sinus MRI and later on, the patient received 3 cycles of ICE (ifosfamide, cisplatin, and etoposide) chemotherapy. After the chemotherapy regimen was completed the paranasal sinus MRI showed very little regression. So, 300 cGy/frc., totally 3000 cGy radiotherapy was performed. The patient died just after the radiotherapy. Diagnosis of this disease relies on clinical presentation and immunophenotypic and molecular characteristics, and morphological features are not specific. In addition to radiographic and laboratory testing, large biopsies should be taken for immunohistochemical analysis to achieve diagnosis and guide further management. These lymphomas, often require multidisciplinary management. The survival of patients with Non-Hodgkin's Lymphomas involving both the nasal cavity and paranasal sinuses is also poorer than that of patients in whom it was limited to the nasal cavity.

## **Concomitant chemoradiotherapy with weekly low-dose cisplatin in patients with locoregionally advanced head and neck cancer: retrospective toxicity analysis**

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**Objective:** We evaluated toxicity in 27 patients with locoregionally advanced squamous cell carcinoma of the head and neck who were treated by concomitant chemoradiotherapy



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**Patient and Method:** 76 patients with locoregionally advanced head and neck cancer had received radiotherapy between January 2000 and December 2004, of the patient, 27 received radiotherapy with concurrent chemotherapy. Nine of 27 patients received postoperative chemoradiotherapy and 18 received with definitively concurrent chemoradiotherapy. Radiotherapy was given as 60Gy-70Gy, over 6-7 weeks to the primary site and lymphatics, 50 Gy for the lower neck (2 Gy/day, 5 fractions/ week) All of 27 patients received external beam radiotherapy with concurrent Cisplatin (25-30mg/m<sup>2</sup>) once a week for 4 -7 weeks (mean 5 weeks)

**Results:** We made evaluation according to Acute Radiation Morbidity Scoring Criteria (RTOG).

Grade2/3 acute toxicity was seen mostly as mucositis, cutaneous reaction. Toxicity was not significant and led to prolongation of treatment time. All of patients completed the chemoradiotherapy. Unfortunately, 5 of 27 patients died just after chemoradiotherapy was completed. Follow up time was 1-88 months (median 25 months). 2, 3, and 5 years overall survival was 55.5%, 48% and 37% respectively. No improvement in overall survival was seen.

**Conclusion:** Concomitant chemoradiotherapy with weekly low-dose cisplatin in patients with locoregionally advanced head and neck cancer was not found to be toxic but some of patients died just after chemoradiotherapy because of either thromboembolic event or malnutrition as a result of mucositis. We must give supportive treatment as anticoagulants and nutritional products in patients treated with chemoradiotherapy.

## Tonsillar Kaposi's sarcoma in a non-AIDS patient

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Kaposi's sarcoma of the tonsil is extremely rare. We present a case of a 36-year-old HIV-negative male patient presenting with Kaposi's sarcoma localized to the tonsil. There was no palpable lymph node on neck examination. An excisional biopsy of the left tonsil was performed. The pathology was reported as Kaposi's sarcoma. Clinical and radiological evaluations did not show any systemic involvement.

An HIV test was negative. Fine needle biopsy of the left cervical lymph node revealed benign cytology. A left tonsillectomy was performed in July 2009 and the pathology showed Kaposi's sarcoma and right tonsillectomy was performed in August 2009 and the pathology showed lymphoid hyperplasia and chronic inflammation. The patient is alive and remains well for 20 months.

## Carotid artery evaluation in patients with head and neck malignancy treated with radiotherapy

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**Objective:** It is established that small and medium sized arteries undergo extensive radiation damage. Although it is known that radiation-induced carotid stenosis in patients with head and neck tumors can cause significant mortality and morbidity, the effect on large vessels such as carotid arteries is less well understood This study examined the incidence of stenosis in the extracranial carotid arteries of head and neck carcinoma patients after radiotherapy.

**Method:** The extracranial carotid arteries of 50 (45 male and 5 female, mean age of 60 years) pre and postradiation patients with head and neck localized malignancies were examined with color Doppler ultrasonographic scanning. No surgical treatment was performed for 27 patients. Radiotherapy was given in curative intent for all of the patients (5040 - 7000 cGy). Of the patient 19 were treated with chemoradiotherapy (1 patient, in every 3 weeks, 80mg/m<sup>2</sup>cisplatin, 18 patients, weekly 25mg - 40mg/m<sup>2</sup>cisplatin).

**Results:** There was no difference between preradiation and postradiation Doppler ultrasonographic scanning in 13 patients (26%). In 37 patients(74%) we detected changes in the carotid arteries. Atherosclerosis was found in 12 patients (24%), plaque formation was found in 17 patients (34%), intimal thickening in 8 patients (16%).

**Conclusion:** These findings suggest that radiation can have an adverse effect on large vessels. Colour Doppler ultrasonographic scanning for the patients receiving head and neck radiation therapy may be necessary for early detection and possible intervention of this radiation-induced complication.



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## Early thyroid volume and function changes after radiotherapy for non-thyroid head and neck cancer radiotherapy

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**Objective:** The aim of the present study was to evaluate early the changes in thyroid dysfunction after radiation therapy for non-thyroid head and neck cancer either with or without surgery.

**Method and Material:** Thirty one patients receiving neck irradiation including the thyroid gland were recruited in the study. There were 2 female and 29 male patients.

The characteristic features of the patients are listed in the table. Ellipsoid Formula [(Volume (ml) = Length (cm) x Width (cm) x Thickness (cm) x 1/6 π)] is used to calculate thyroid volume.

The radiotherapy was given in curative intend in all of the patients. Radiotherapy dose was between 50.4 Gy and 70 Gy (median 66 Gy). The tumor were located in the larynx (n=26), floor of mouth (n=1), hypopharenx (n=1) and nasopharnx (n=3) in 2 female and 29 male patients including Tis (n=1), T1 (n=3), T2 (n=9), T3 (n=8), T4 (n=9) and Nx (n=1), N+ (n=8), 13 patients were operated, 18 patients did not have surgery and 12 patients underwent chemoradiotherapy.

**Results:** Of 31 patients in 2 patients (6.4%) there were no changes detected in thyroid volume, decrease in volume was found in 17 patients (54.8%) and increase in volume was found in 12 patients (38.7%).

**Conclusion:** The thyroid gland is the largest pure endocrine gland in the body and one of the organs most likely to produce clinically significant abnormalities after therapeutic external

## Challenges in the surgical management of Merkel cell carcinoma in the head and neck: The Newcastle experience

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**Objective:** Merkel cell carcinoma (MCC) is a rare, aggressive skin tumour. Controversies regarding optimal management persist due to inadequate data and knowledge regarding tumour biology. Head and neck MCC enhances both oncological and reconstructive challenges, compounded by predominantly elderly patients. We review our practice and outcomes.

**Method:** All patients with primary head and neck MCC, January 2001 – December 2010, were identified through retrospective analysis of the pathology coding database. All cases were managed within the regional skin cancer multidisciplinary setting.

**Results:** 19 patients, with a mean age of 85 years (78–94 years) and presenting with mean symptom duration of five months had primary tumours involving the nose (n=2), peri-orbital region (n=5), cheek (n=5), and the temple and scalp (n=7). Mean tumour size was 2.1cm (range 0.5–7.5cm). Four patients (21%) had a history of

immunodeficiency. The majority underwent wider local excision with margins ranging from 0.5–2.0cm. Reconstructive techniques were; skin grafting (n=7), local flaps (n=4) and free antero-lateral thigh flap (n=1). Two patients (11%) demonstrated nodal disease at presentation. Eight patients (42%) re-presented with nodal recurrence at a mean of seven months with six undergoing salvage neck dissection. Primary adjuvant radiotherapy was completed in five cases, and chemotherapy used for palliation in one case. The vast majority of patients declined radiotherapy due to side-effects or frailty.

**Conclusion:** Our series demonstrates the profound challenges in managing head and neck MCC, including tailoring definitive primary treatment to elderly patients. Regional nodal assessment and management remains crucial to achieving this goal.



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## A one-stop clinic for urgent cancer referrals - an efficient use of resources?

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**Objective:** The UK uses primary care physicians as “gatekeepers” to specialist services. In 2000 a referral pathway was implemented for patients with suspected Head & Neck cancer ensuring assessment by a specialist within 2-weeks of referral. In 2004 a further national recommendation was made to establish diagnostic one-stop clinics for neck lumps in an effort to improve outcomes for Head & Neck cancer. Our aims were: -

- i) Assess the cancer detection rate for 2-week wait referrals
- ii) Decide whether a one-stop clinic would be an appropriate use of resources

**Method:** A retrospective audit of all 2-week referrals from July 2009 to July 2010.

**Results:** Total 2-week-wait referrals = 622  
Confirmed malignancy = 35 (6%) Total malignancies between July 2009-July 2010 = 143.  
Only 230 patients (37.0%) required a follow-up appointment of which 182 patients underwent further investigations. Only 93 patients (15%) underwent a FNA and 76 (12%) an ultrasound scan.

**Conclusion:** Our study confirms that the majority of patients diagnosed with Head & Neck malignancy are referred through routine referral pathways and a specific suspected cancer referral pathway does not improve diagnosis. The limited need for FNA and ultrasound scans suggests that there is unlikely to be any significant benefit in implementing a one-stop clinic, either to the patient or as a more efficient use of resources.

## A comparison of Thiel and formalin embalmed cadavers for thyroid surgery training

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**Objective:** The European Working Time Directive has increased the need for surgical skills training, which does not involve patients. Recent changes in the anatomy legislation now make it possible to perform surgical procedures on human cadavers. Standard formalin embalming, however does not provide a very realistic model and alternative approaches, such as Thiel soft-fix embalmed cadavers, should be explored and evaluated.

**Method:** Two formalin and three Thiel embalmed cadavers were used at a senior trainee and consultant level course in thyroid surgery. The 12 participants (8 trainees and 4 consultants) were asked to score 15 aspects, broadly encompassing tissue quality, procedure perception and identification of structures, for each type of cadaver. Some of these aspects were specific to thyroid surgery, however many are equally applicable to other specialties.

**Results:** Two formalin and three Thiel embalmed cadavers were used at a senior trainee and consultant level course in thyroid surgery. The 12 participants (8 trainees and 4 consultants) were asked to score 15 aspects, broadly encompassing tissue quality, procedure perception and identification of structures, for each type of cadaver. Some of these aspects were specific to thyroid surgery, however many are equally applicable to other specialties.

**Conclusion:** Thiel embalmed cadavers provide a more realistic model for training of thyroid surgical skills; this is expected to be similar for many other types of surgery.



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## A retrospective 5 year analysis of those undergoing neck dissection for melanoma: does Breslow thickness still have a prognostic value?

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**Objective:** There were 11, 767 cases of malignant melanoma (MM) diagnosed in the UK in 2008. Approximately 30% occur in the head& neck region. Breslow thickness (BT) is known to relate to disease prognosis. However, there is little data on whether BT is predictive of number of positive nodes found or overall survival of the patient.

**Method:** This was a single centre, two surgeon retrospective audit over a 5-year period (2006 to 2010). Patients undergoing neck dissections for MM were identified from the surgeon's logbook. The relevant patients' notes and pathology database were analysed.

**Results:** 25 neck dissections for MM were carried out over a 5 year period. 18/25 were male. The age range was 43 – 92, with a mean age of 69. There was no relationship between BT of primary lesion and the number of positive nodes subsequently found on neck dissection (correlation co-efficient = - 0.34). There seems to be no statistically significant relationship between BT and both recurrence or survival.

**Conclusion:** It appears that once MM has progressed to a level that requires a neck dissection, the prognostic value of BT disappears. This audit would seem to suggest that Breslow thickness neither relates to the number of positive nodes or overall survival, although further larger higher power studies are required to prove this.

## Salivary ductal carcinoma

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Salivary ductal carcinoma is one of the most aggressive salivary gland carcinomas, which phenotypically resembles high-grade breast ductal carcinoma. The parotid gland is the most common site of involvement. Following conventional treatment, usually surgery with radiotherapy, the local recurrence rate is high and is associated with both cervical nodal involvement and distant metastases. Traditionally chemotherapy has only been offered for end-stage disseminated disease but there is evidence supporting improved disease control may be achieved by using it as adjuvant therapy in combination with radiation. Human epidermal growth factor receptor 2 is a proto-oncogene over-expressed in both breast and salivary ductal carcinoma. Its over-expression is associated with a worse prognosis in breast ductal carcinoma. Clinical trials have shown significant efficacy of trastuzumab (a monoclonal antibody directed against human epidermal growth factor receptor 2) in tumour response and longer survival duration in metastatic breast cancer. With advances in immunohistochemistry, targeted immunotherapy for breast ductal carcinoma can be applied to salivary ductal carcinoma. This paper reviews the latest treatment options for salivary ductal carcinoma.

## A study to validate existence of phantom larynx phenomenon or false perception of an intact larynx after laryngectomy

Prashant Pawar, Pankaj Chaturvedi

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**Hypothesis:** Phantom larynx phenomenon (false perception on an intact larynx) exists and is an important issue in post-laryngectomy rehabilitation.

**Objective:** Phantom limb phenomenon has been described after amputation of a limb or other parts



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of the body. Amputation or removal of any part is usually associated with a global feeling that the missing part is still present. We undertook this study to identify whether a phantom larynx phenomenon actually exists in post-laryngectomy (PL) patients. We also aimed to elicit its association with the duration following surgery.

**Patients and Methods:** We did a clinical survey of 66 PL patients (30-80 yrs of age). Twenty two of these patients were assessed within 6 months following surgery while 44 patients were assessed at least 6 months later. A questionnaire containing 11 questions was served to these patients pertaining to false perception of persistent laryngeal functions and adaptation to the postlaryngectomy status.

**Results:** All patients showed evidence of a phantom larynx phenomenon. In majority of these patients it persisted even after 6 months following surgery. There was no significant difference in the two groups (less than or more than 6 months) except for one question pertaining to occlusion of stoma for speech (77% vs 29%). False perception of nasal breathing (59% and 43%) and olfactory sensation (63% in both groups) were the most common.

**Conclusion:** Phantom larynx phenomenon following laryngectomy does exist and may cause anxiety and poor rehabilitation among patients. Patient education and rehabilitation with regards to such a phenomenon is therefore needed in all patients.

## Prospective study of intraoperative assessment of lymph node metastases in patients with oral cancer undergoing neck dissection

Gouri Pantvaidya

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**Background:** The sensitivity of clinical examination for neck node metastases varies from 60-70%. Most imaging modalities too have a sensitivity of approximately 75%. Accurately diagnosing neck node metastases in patients with oral cancer still remains a problem. We decided to perform a prospective study looking at the sensitivity, specificity and accuracy of intraoperative assessment of the lymph nodes by the operating surgeon. If found to be accurate, this would add to our armamentarium for diagnosing neck node

metastases and avoid usage of intraoperative frozen section.

**Methods:** Patients undergoing neck dissection during surgery for oral cancers were included. All lymph node levels were separately dissected out. The surgeon performing the neck dissection commented on the node being metastatic or not, for each level. This was then compared to the histopathology report.

**Results:** 130 patients were included in the study. The sensitivity for diagnosing metastases at level IA, IB and III was 38%, 56% and 33% respectively. The sensitivity was the highest for level II, at 72% and 80% for level IIA and IIB respectively. Only 1 of the 5 patients with nodal metastasis at level IV, and none of the six patients with nodal metastasis at level V were correctly identified.

**Conclusions:** The overall sensitivity for Intraoperative assessment was best for levels IIA and IIB. This finding along with radiologic assessment could be used to prevent unnecessary dissection of level IIB thereby preventing damage to the spinal accessory nerve and avoiding the resultant dysfunction.

## Anti-proliferative effects on neuroblastoma cell by mangosteen extracts

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**Introduction and Objective:** Neuroblastoma is an embryonal tumour of the sympathetic nervous system. Despite many advances during the past three decades, neuroblastoma has remained an enigmatic challenge to clinical and basic scientists. The mangosteen tree has been cultivated for centuries in tropical areas of the world. The tree is presumed to have originated in Southeast Asia. In Thailand, it was denoted to be the queen of fruits. The mangosteen rind, leaves and bark have been used as folk medicine for thousands of years. This study presents anti-proliferative effects of  $\gamma$ -mangostin on neuroblastoma cell line (Neuro-2A).

**Methods:** In our research study about morphological changes, MTT assay for cell viability, time and dose response, Hoechst 33342 staining, DNA fragmentation, and immunoblotting analysis of



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PARP and Bax in Neuro-2A cell line after treated with  $\gamma$ -mangostin.

**Results and Conclusion:** The results indicated anti-proliferative effects of  $\gamma$ -mangostin on neuroblastoma cell line, Neuro-2A with IC<sub>50</sub> = 7.49  $\mu$ g/ml. The antiproliferation was shown to be in a time and dose dependent fashion. Upon treatment of the cells with  $\gamma$ -mangostin, apoptotic cell death was detected as determined by morphological changes of neuronal cells including membrane blebbing and cell shrinkage. Chromatin condensation and DNA fragmentation were also detected. For immunoblotting analysis  $\gamma$ -mangostin can induce apoptosis mechanism showing cleaved of PARP and expression of Bax.

**Keywords:** apoptosis,  $\gamma$ -mangostin, Neuro-2A.

## A 7-year review of clinicopathologic profile of gastrointestinal stromal tumors (GIST) patients

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**Objectives:** This study aimed to describe the clinicopathologic profile and management of gastrointestinal stromal tumor (GIST) patients at a tertiary medical center [University of the Philippines - Philippine General Hospital (UP-PGH)] from 2004-2010.

**Methods:** This is a retrospective study of GIST cases admitted at the UP-PGH Department of Surgery from January 1, 2004 to December 31, 2010. Electronic database of the Department of Surgery, logbooks of the Department of Pathology and patients' medical records were reviewed. Data frequencies and percentages were then computed.

**Results:** Seventy-four cases were identified. There was slight male preponderance, with median age of 53. Stomach was affected in 53% of cases, while extraintestinal sites accounts for only 3%. Abdominal pain is the most common symptom. On initial operation, 66% had localized primary while 34% had advanced disease either with adjacent organ invasion or metastasis. Liver is the most common site of metastasis. Definitive surgery was done in 91% of cases by wide excision(35%), single organ resection(30%), and en-bloc multi-organ resection(26%). Common immediate post-op complications include superficial surgical site infection (SSSI), and health-care related pneumonia.

**Conclusion:** GIST clinical presentation is widely variable. The most affected age group is between 4th to 7th decade of life. Primary tumors often involve the stomach, with many cases already having invasion or metastasis at the time of initial operation. Recurrence is common, usually within 2 years post-operatively.

## Head and neck cancer clinic referrals: A higher referral rate for those at most risk?

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**Objective:** Alcohol and tobacco use are risk factors for head & neck cancer, as are; gender, age and social deprivation. International studies show higher incidences in certain ethnic groups, which may be reflected in immigrant populations. In the UK, a two-week referral pathway has been implemented to prioritise patients with suspected malignancy.

**Aim:** Assess whether high-risk demographic groups are being appropriately referred.

**Method:** A retrospective study of patients referred to the head and neck cancer clinic at a large UK teaching hospital between July 2009 and July 2010.

**Results:** 622 patients were referred using the 2-week pathway with a mean age of 57 years old (range 18-95 years old) and male:female ratio of approximately 1:1.

57% of patients were Caucasian, 8% were Asian, 4% were African or afro-Caribbean and 1% were Chinese.

44.5% of patients resided in the most deprived areas and only 3.4% resided in the most affluent.

Only 5.5% of patients were diagnosed with a malignancy.

**Conclusion:** Concerns raised that patients from socially deprived areas are not benefitting from priority referral pathways have not been confirmed by our study. The ethnicity of referred patients is reflective of the local population. Interestingly Caucasian patients were more likely to have a malignant diagnosis.

This study suggests the need for regional data in the development of referral initiatives. We propose



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a number of recommendations to improve the referral pathway including:

- Improving access to appropriate local epidemiological data
- Improving patient information amongst high-risk groups

## **Comparative study of PET-CT, CT scan, USG and clinical examination in accurate detection of neck nodal metastasis in oral squamous cell carcinoma**

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**Introduction:** Accurate prediction of occult metastasis has an impact on the management of the neck and also on the prognosis in oral squamous cell carcinoma. Current literature is in favour of Ultrasound guided Fine Needle Aspiration Cytology as most accurate for predicting occult metastasis. However this being invasive has its drawbacks. This study aims at determining the most accurate non invasive modality by comparing Positron Emission Tomography, Computerised Tomography, USG alone and Clinical examination. The secondary endpoint was to determine the ability of the imaging modalities in accurately diagnosing level wise involvement of nodes, especially Level IV and V. The incidence of occult metastasis in the presence of clinically doubtful nodal metastasis is determined as also the incidence of skip metastasis according to various subsites of the oral cavity.

**Material and Methods:** 71 biopsy proven oral squamous cell carcinoma patients with doubtful cervical lymphadenopathy were included. In all 86 operated necks were considered for analysis. They were subjected to clinical examination, USG, CT scan and PET-CT scan each reported by an expert in that field. Each modality report was blinded from the other. Surgery (primary tumour excision with neck dissection) was performed within 6 weeks. Level wise separation of the nodes was done intraoperatively. Histopathological gold standard was compared to the various imaging modalities including level wise reporting of nodal metastasis by the pathologist as well as the imaging modality specialist. Incidence of occult metastasis and skip metastasis according to subsites was determined.

**Results:** CT scan was the most accurate of all non invasive imaging modalities with PET not adding any extra information. USG was more accurate when indeterminate nodes were considered as malignant. All imaging modalities had accuracy above 95% in determining nodal metastasis at Level IV and 100% at Level V.

## **Facial nerve palsy rates following parotid surgery at bradford teaching hospitals, U.K., 1998-2008**

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**Objectives:** To report rates of facial nerve injury following parotidectomy between 1998 and 2008 at a teaching hospital institution. To assess the impact of use of nerve stimulators and nerve monitor.

**Methods:** A retrospective case note review of all parotidectomy procedures performed at Bradford Teaching hospitals, U.K., between 1998 and 2008.

**Results:** Data was collected for 177 parotidectomy procedures. 34% of all patients were found to have facial nerve paralysis after the operation, with marginal mandibular branch being the commonest branch affected; 7% of all patients had permanent palsy; 26% had temporary palsy, in which patients gained full recovery within 6 months post-operatively. Of the patients with facial nerve palsy post-operatively, 29% of them suffered from malignant disease. Nerve monitor use was documented in 62% of cases.

**Conclusions:** This study shows that our results are comparable with the literatures. Temporary facial nerve palsy is more common and the average recovery time is 3 months. Nerve stimulator and monitor use is more common in ORL specialities compared to Maxillofacial and General Surgery and has become increasingly used in recent years.

**Lymphoepithelial tumors of the parotid gland in Asians – a case series**

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**Objectives:** Lymphoepithelial tumors of the parotid gland are rare but occur more frequently amongst the Asian population. This case series aims to define several of the more common characteristics of patients with lymphoepithelial tumours of the parotid gland.

**Methods:** All patients who had undergone superficial/total parotidectomies between 1st January 2007 and 15th January 2011 in Singapore General Hospital were identified. 15 patients out of 401 had lymphoepithelial lesions diagnosed on histology.

**Results:** The case records of these 15 patients were reviewed. 12 had benign disease and 3 were diagnosed with lymphoepithelial carcinoma. 9 out of 15 were female; 12 of the 15 were of Chinese ethnicity, and the other 3 were Malay. The youngest patient was 37 years old and the oldest 86. Majority of patients were between 45-70 years old (12 of 15). 9 out of 15 patients had hypertension. Only 1 of the 15 patients was a smoker, and none regularly drank alcohol.

**Conclusion:** Lymphoepithelial lesions of the parotid seem to occur more commonly in middle-aged to elderly patients of Chinese ethnicity. There does not seem to be an association with gender, tobacco or alcohol use. Many patients also had co-existing hypertension, however, this is unlikely to be related to the development of lymphoepithelial lesions.