

PLASTIC AND RECONSTRUCTIVE SURGERY

PR001
CLEFT ORTHOGNATHIC SURGERY

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This paper examines maxillary growth deficiency in patients with cleft lip and palate. The Brisbane experience is presented, with an outline of our protocol for the dento-skeletal management of this group, together with the Children's Oral Health Service. Indications for surgical intervention include occlusal disproportions and respiratory obstruction not correctable otherwise. Selected cases are used to demonstrate our management of these orthognathic candidates.

PR002
MIDDLEMORE CRANIOFACIAL TEAM EXPERIENCE OF RARE CRANIO-FACIAL CLEFTS

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A 20 year experience of the rare 'Tessier' cranio-facial clefts is presented. Despite the small size of the NZ population we have managed to collect a series of cases almost encompassing the entire range of Tessier's 14 classification types.

Representative cases will be shown and discussed indicating the special management problems of each type. While we may not have a huge volume of these interesting and unusual cases we will show, photographically, the quality of the surgical outcomes.

References

1. Tessier P. Anatomical classification of facial, craniofacial and laterofacial clefts. *J Maxillofacial surgery* 1969, 4:69.
2. Kawamoto HK. Jr. Chapter 31, Cranio-facial clefts pp. 349–363, Grabb & Smith's Plastic Surgery 5th Edn. 1997.

PR003
MICROSURGICAL HEPATIC ARTERY RECONSTRUCTION IN PAEDIATRIC LIVER TRANSPLANTS: THE ROYAL CHILDREN'S HOSPITAL BRISBANE EXPERIENCE

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Purpose Hepatic artery thrombosis (HAT) remains a serious complication of paediatric liver transplantation. HAT can lead to a spectrum of complications including biliary leaks and stricturing, hepatic infarction, intrahepatic abscess formation, graft failure and death. Particularly considering the limited supply of donor organs, HAT is a leading cause of re-transplantation.

Microsurgical hepatic artery reconstruction has been performed at some units around the world since the 1990s, showing improvements in HAT rates. Other units advocate hepatic artery reconstruction without the use of the operating microscope. Since 2000 most of the liver transplants performed at the Royal Children's Hospital in Brisbane have used a microsurgical hepatic artery reconstruction technique involving members of the Plastic and Reconstructive Surgery Unit.

Methodology A retrospective study was performed using the computerised database of the Queensland Liver Transplant Service.

Results Between 2000 and 2005, there have been 23 paediatric liver transplants performed at the Royal Children's Hospital using a microsurgical hepatic artery reconstruction technique. There has been 1 HAT (4.3%), 0 re-transplants within the first post operative year and a 91.3% one year survival. This compares with 88 transplants performed between 1995 and 2005 without the use of the operating microscope. In this group there were 13 HAT (14.7%), 11 re-transplants and a one year survival of 77.5%.

Conclusions Microsurgical hepatic artery reconstruction is a useful technique which may decrease hepatic artery thrombosis rates, decrease the need for re-transplantation and improve survival.

PR004
THE LAWN MOWER BOY

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Powered lawn mowers continue to be a common but unnecessary cause of severe injury, especially in children. Between 1998 and 2001 50 children were treated for lawn mower related injuries in Victorian hospitals. In Australia, ride-on mowers account for between 10–40% of all child lawn mower injuries, with the majority of injuries involving the lower limb. We present the case of a four year old boy who sustained severe skeletal and soft tissue injuries to both feet after being run over by the ride-on mower his seven year old brother was driving. We detail the reconstruction of both feet using simultaneous bilateral free flaps, a process requiring significant operative planning to ensure the reconstructed feet would enable the patient to regain mobility and to ensure minimal flap ischaemia time. We believe this patient to be the second youngest person in the world reported to undergo a simultaneous multiple free flap operation.

PR005
FACIAL PORT-WINE STAINS – CLINICAL STRATIFICATION AND THE RISK OF NEURO-OCULAR INVOLVEMENT

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Background Port-wine stains (PWS) are capillary malformation that commonly involves skin in the head and neck region. Ipsilateral leptomeningeal and/or ocular disease occur in some cases.

Aim To analyse a series of consecutive patients with facial PWS to (1) stratify clinical manifestations; (2) identify the risk of neuro-ocular involvement according to topographic pattern; and (3) propose a biological basis for facial PWS.

Methods Cases were culled from our Vascular Anomalies Database 1996–2006. The PWS was topographically mapped to sensory distribution of branch(es) of the trigeminal nerve and/or cervical plexus and/or dorsal rami.

Results Of 156 patients identified, 31 had additional truncal ($n = 4$) and/or limb ($n = 4$) and/or mucosal/conjunctival ($n = 27$) involvement. Nodule formation ($n = 20$) and/or soft tissue ($n = 16$) and/or bony ($n = 3$) hypertrophy occurred in 28 patients. In the 14 patients with associated neuro-ocular disease, PWS affected the entire ($n = 5$) or part of ($n = 9$) V1 as well as V2 ($n = 5$) and/or V3 ($n = 3$) in 6 patients. 5 of the 7 patients with PWS affecting the entire V1 had neuro-ocular involvement. The risk of associated neuro-ocular disease in a patient with PWS in the V1 distribution is 20%, epilepsy and glaucoma being the commonest manifestations. This neuro-oculo-cutaneous syndrome results from vascular malformation of nearby structures (facial skin, eye, and parieto-occipital region of the brain) derived from the neuroectoderm.

Conclusion The clinical stratification of facial PWS guides patient counselling and therapeutic interventions. PWS affecting the V1 distribution predicts strongly for underlying neuro-ocular disorder and requires on-going neurological and especially, ophthalmologic surveillance.

PR006
IMPLICATIONS OF A PROGRESSIVE VERTEX BULGE FOLLOWING MODIFIED STRIP CRANIECTOMY FOR SAGITTAL SYNOSTOSIS

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Purpose Modified strip craniectomy is a common treatment for early isolated sagittal synostosis. The authors assessed the significance of the development of a progressive vertex bulge following strip craniectomy as a predictor of raised intracranial pressure or multiple suture synostosis.

Methodology All cases of sagittal synostosis treated by modified strip craniectomy at our institution were reviewed. Patients who developed a progressive vertex bulge following modified strip craniectomy were evaluated with regards to clinical course, radiological investigations, genetics testing and need for intracranial pressure monitoring.

Results Of 113 patients presenting with isolated sagittal synostosis, 80 were treated by modified strip craniectomy usually before six months of age (removal of the sagittal suture with lateral barrel staving). Seven patients were noted to have developed a progressive vertex bulge. The vertex bulge was noted an average 10 months post op (range 2–37 months). CT scanning demonstrated new synostosis involving other calvarial sutures in four patients. Five patients underwent intracranial pressure monitoring, and this was elevated in four patients. Two patients were found to have Fibroblast Growth Factor Receptor mutations on genetics testing. All patients required reoperation (calvarial remodelling) for either raised intracranial pressure, deteriorating head shape or both.

Conclusions A progressive vertex bulge developing after modified strip craniectomy is an indicator of possible raised intracranial pressure or the development of progressive multiple suture synostosis.

PR007

NASAL DERMOID SINUS CYSTS: A RETROSPECTIVE REVIEW AND DISCUSSION OF INVESTIGATIONS AND MANAGEMENT

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Nasal dermoid sinus cysts are uncommon congenital anomalies presenting either as cysts or sinuses. They are frequently associated with extension into the intracranial space requiring craniotomy for adequate resection. At the Royal Children's Hospital in Melbourne, Australia we have managed 25 patients with nasal dermoid sinus cysts over eight years and present details of clinical features, preoperative assessment and surgical management. Six patients presented with infection including one with osteomyelitis. Four of our patients had intracranial extension of their lesions and all were treated successfully with tailored investigation and appropriate surgical procedures. Insights into diagnosis, investigation and surgery are offered to facilitate the management of these challenging lesions.

PR008

ORBITAL HYPERTELORISM CORRECTION – A 25 YEAR EXPERIENCE

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Purpose To review the main aetiologies of orbital hypertelorism presenting at our centre, the trends in our surgical treatment and its morbidity, to identify factors which may influence our future approach to the condition.

Methodology An initial review of the historical surgical approaches was conducted. A search of our Unit Database was then used to identify patients with possible orbital hypertelorism, followed by a retrospective review of patient records and imaging.

Results Thirty-three cases were included in the study. The main causes for hypertelorism were craniofrontonasal dysplasia, frontonasal dysplasia, encephalocele, facial clefting and craniosynostosis syndromes. An analysis of the aetiology, the technical approach and morbidity has been undertaken. The complication profiles of the different aetiologies and operative procedures have been described, with possible patterns emerging.

Conclusions There are several important points regarding the surgical treatment of orbital hypertelorism. The present study reviews the results at our centre, which have relevance for future treatment here and for other craniofacial surgical centres.

PR009

THE NASAL AIRWAY AND FACIAL GROWTH IN CLEFT PATIENTS

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Many cleft patients have abnormal facial growth, with resulting maxillary retrusion. This presentation reviews the cleft lip and palate protocol followed by Dr J-C Talmant (Nantes, France), which attempts to address these issues.

The establishment of a functional nasal airway at the first operation is crucial, as the patency of a nasal airway in childhood has important implications on facial growth. The early achievement of an appropriate transverse maxillary diameter assists the establishment of a nasal airway. Closure of the palatal cleft without leaving any raw surfaces reduces palatal scarring, and hence decreases maxillary growth restriction due to scar contracture.

This protocol aims to ensure a patent nasal airway at each stage of the surgery. No pre-surgical orthodontics are used, which makes it applicable anywhere in the world. The lip and the soft palate (with intravelar veloplasty) are repaired at 6 months of age, along correction of the alar deformity. The residual hard palatal cleft is then closed at 18 months of age without, any reported fistulas.

After pre-operative expansion of the maxilla, alveolar bone grafting is then performed at 4–5 years of age, which is earlier than other protocols. At the age of 5 years these patients will have a patent nasal airway and a normal occlusion, and hence should have normal facial growth. This negates the need for osteotomies to correct the occlusion at the completion of growth.

PR010

TRANSVERSE DIMENSION IN ORTHOGNATHIC SURGERY

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There has been an increase in the number of adults seeking treatment for dento-alveolar deformities.

Since 1982 the Maxillo-facial Unit at Royal North Shore/Mater Hospitals has carried out over 2000 surgical corrections for malocclusion.

What we would like to present in this paper is a change in our management of the transverse dimension.

Orthognathic surgical procedures have classically included osteotomies to treat deformities in the vertical and sagittal planes. The post-treatment stability and relapse following orthognathic surgical procedures to correct these deformities have been well delineated.

The transverse dimension has always been difficult to correct and control and may be more crucial than either the anteroposterior or vertical dimensions in achievement of a stable and functional occlusion.

When a large transverse maxillary discrepancy exists and is diagnosed adult patients have been traditionally treated with segmental maxillary osteotomies resulting in transverse maxillary instability and relapse following orthognathic appliance removal.

The purpose of this paper is to identify the clinical characteristics of transverse maxillary deficiency and explore the possibility of treatment with surgically assisted maxillary expansion.

Our approach over the last 3 years is to address the constricted transverse dimension with surgically assisted maxillary expansion at the start of orthodontic treatment.

We will discuss the methods used for diagnosis and treatment in the skeletally mature patient and present the results of consecutive cases who have completed their orthognathic surgery.

PR011

THE GREAT ORMOND STREET LADDER – A METHOD FOR SCORING HAND FUNCTION

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Aims To develop a simple, rapid and reliable method for scoring hand function.

Methods We have distilled the process of assessing hand function down to the analysis of seven tasks. These tasks, or key performance indicators of hand function, may be viewed as rungs on a ladder of functional ability. A score, indicating the level achieved on the ladder, is generated by awarding a 0, 1 or 2 rating to the competence with which each task is completed. A maximum score of 14 is achievable. The investigating team of three Plastic Surgeons applied the scoring system to 30 patients in the congenital hand anomalies clinic at Great Ormond Street Hospital.

Results The ladder concept provided a practical assessment of function across a broad range of paediatric hand deformities. There was minimal inter-observer variability using this scoring system.

Conclusion The Great Ormond Street Ladder provides guidelines for the structured observation of hand function in children and clarifies the decision making process in complex cases. It can also be applied to the analysis of functional problems in a broad range of hand conditions including brachial and cerebral palsies, athridies and trauma.

**PR012
TOTAL EAR RECONSTRUCTION**

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Since the visit of Francoise Firmin to Sydney in 1996 over 100 cases of total and partial ear reconstruction have been carried out in the Royal North Shore Hospital/Mater Hospital Plastic & Maxillo-Facial Unit.

The results of 15 cases were presented in 1999.

The purpose of this paper is to highlight the changes in technique which have evolved, the improvement in results and to discuss the complications we have experienced.

There has still been a very close co-operation with the Unit of Dr Francoise Firmin in Paris with frequent visits to this Unit and one of the authors has spent the last year of his training in Maxillo-Facial surgery with Dr Firmin in Paris and will present a summary of her present protocol.

10 consecutive cases of ear reconstruction done in Sydney and 7 cases done in Colombo, Sri Lanka, over the last 12 months will be presented. These cases will demonstrate the changes that have occurred in cartilage construction and management of the soft tissues.

**PR013
CAN TUMOUR MITOTIC RATE PREDICT SENTINEL NODE BIOPSY POSITIVITY IN CUTANEOUS MELANOMA**

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Aim The aim of this study was to define the association between tumour mitotic rate (TMR) and sentinel node biopsy (SNB) positivity.

Method Information on 328 patients who underwent SNB and excision of their primary cutaneous melanomas was extracted from the Sydney Melanoma Unit (SMU) database. All histological specimens were examined by histopathologists at the Dept. of Anatomical Pathology of the Royal Prince Alfred Hospital. Patients with complete information on tumour thickness, ulceration, TMR and SN status were included. 67 patients had insufficient data and were excluded from the study.

Results Of the 328 SNB's performed, 50 were positive and 278 negative. TMR was measured per mm² in the area of highest mitotic activity. Results were divided into groups - 0, 1-4, 5-10, >10 and figures returned were 54, 133, 84 and 57 respectively.

In univariate analysis using the Pearson chi-squared test TMR was found to be a significant prognostic indicator of SNB positivity ($P = 0.04$). By linear association a significant trend towards SNB positivity with increasing TMR was found ($P = 0.025$). However, in multivariate analysis by logistic regression using forward step-wise methods TMR was not found to be a significant prognostic indicator of SNB positivity. Using Pearson chi-square and linear association we found a strong correlation between TMR and tumour thickness ($P = 0.000$ for both).

Conclusion TMR is not a significant independent prognostic indicator of SNB positivity, and does not provide a better estimate than primary tumour thickness.

**PR014
IVC FILTERS & LOWER LIMB FLAP RECONSTRUCTIONS**

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Purpose The use of inferior vena cava (IVC) filters is growing as the indications evolve and broaden. IVC filters are now being used prophylactically in the trauma patient at a high risk of thromboembolism disease. Complications of IVC filters include insertion site and IVC thromboses, lower

limb oedema and venous insufficiency. To the authors' knowledge the effect of IVC filters on lower limb flap reconstructions has not been addressed in the literature. The aim of this study is to determine whether IVC filters affect the outcome of lower limb flap reconstructions in the trauma patient.

Methodology Retrospective review of all patients at the Alfred Hospital (Melbourne, Australia) who had lower limb flap reconstruction(s) and IVC filter placement from 1 July 2001 to 22 March 2005 (44-month period).

Results 17 patients (twelve male and five female) were found to have had 23 lower limb flap reconstructions (10 free, 13 local) and IVC filter insertion. All 23 flaps survived with no flap failures. One flap developed venous congestion but ultimately survived with conservative management.

Conclusions IVC filters do not appear to negatively influence the outcome of lower limb flap reconstructions. These findings are encouraging, and the surgeon may be more confident and reassured in reconstructing soft tissue defects in the lower limb of trauma patients with an IVC filter.

**PR015
PDA-BASED, PORTABLE LASER SCANNER MEASUREMENT OF WOUND SIZE: ACCURACY AND REPRODUCIBILITY**

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The accurate quantification of changes in the area and depth of chronic ulcers is an important part of the treatment process. Current methods usually rely on hand-tracing over onlay grids to estimate surface area, with probes inserted into the wound to estimate depth. These techniques are less than ideal due to their invasive nature and large inter- and intra-observer variability.

A portable, hand-held laser scanner device has been developed for the assessment of chronic ulcers. The scanner consists of a wand containing two lasers and a camera; attached to a hand-held computer or personal digital assistant (PDA). Embedded software calculates the surface area and depth profile of the ulcer. This data is organized into a patient file containing clinical photos, graphs showing changes in ulcer surface area and depth over time, together with clinical notes.

This study was designed to assess the accuracy of the scanner and the inter- and intra-observer variability. Its usability in the clinical setting was also assessed. Vascular ulcer gel models were scanned by three practitioners. Measurements of area and depth obtained were compared to measurements obtained from multi-slice computed tomography (CT) three-dimensional reconstructions of the models and measurements performed using manual techniques.

The laser scanner was accurate to within 2% in surface area and depth measurement compared with multi-slice CT. Overall accuracy, inter- and intra-observer variability was found to be significantly better than results found with manual techniques.

This novel technology has significant promise in wound care management. Clinical trials are currently underway.

**PR016
USE OF THE ORBICULARIS RETAINING LIGAMENT IN LOWER EYELID RECONSTRUCTION**

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Purpose The orbicularis retaining ligament (ORL) is a distinct anatomical structure that has only been recently characterised. A variety of techniques, based on Hamra's concepts, now divide this ligament during lower lid blepharoplasty. This often produces a substantial skin excess which is discarded. We set out to investigate the validity of this surgical manoeuvre as a means of recruiting anterior lamella for the purposes of lower lid reconstruction.

Methodology Between September 2002 and August 2004, 22 patients underwent reconstruction of the anterior lamella of their lower eyelid using this technique. The mean age of the patients was 57 years (26-86). The mean follow up time was 19 months (12-34 months).

Clinical evaluation was carried out preoperatively and postoperatively to assess presence of palpebral non occlusion, epiphora, the sensation of a dry eye, ectropion, conjunctivitis and keratitis. Assessment of the tissue deficit was made clinically and with standardised digital photographs.

Results Satisfactory reconstruction of the anterior lamella of the lower eyelid was achieved in 17/22 patients. Symptoms of epiphora and lower lid

position were improved and all gave a higher score on the visual analogue scale of appearance post operatively. In some cases, particularly in the atrophic lower lid, the results were short lived and further surgery was required to achieve optimal results.

Conclusion In cases of isolated cutaneous deficit in an otherwise healthy lid, the procedure is both successful and aesthetically favourable for resurfacing this challenging area.

PR017
EARLOBE COMPOSITE GRAFT FOR NASAL TIP DEFECTS

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Full thickness skin grafts have been traditionally used as an alternative to local or regional flaps for reconstructing moderate sized defects of the skin of the nose.

They can however produce a less than ideal result because of poor skin colour and texture match, as well as leaving a visible contour defect. The usual donor site has been supraclavicular or posterior auricular skin. An alternative solution of a composite graft utilising the well concealed donor site of the nasolabial fold has been advocated by Hubbard.

In addition to providing a good match to the sebaceous skin of the nose and addressing contour irregularity by preserving the subcutaneous fat the technique dispenses with a bolster, thereby simplifying it and improving patient comfort.

A modification of this technique is presented.

The technique of harvesting then splitting a full thickness wedge of an ear lobe, as a composite graft, not only provides an imperceptible donor site but also allows for precise contour and skin colour matching. It avoids distortion of the nasal tip and of the alar cartilages.

The short to medium term results confirm a pleasing aesthetic result for the donor and recipient sites.

PR018
QUILTING AND CHLOROMYCETIN OINTMENT – AN EFFECTIVE METHOD TO MANAGE FULL THICKNESS SKIN GRAFTS

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Traditionally, skin grafts are secured with tie-over dressings and the dressings are kept strictly dry. For large defects, split skin grafts (SSG) are often used in preference to full thickness skin grafts (FTSG). In this study, we present an alternative approach to FTSG fixation and dressing for defects in the head and neck and hand regardless of their size using the quilting method.

Over a ten-month period, 82 consecutive FTSGs to the head and neck or dorsum of the hand and fingers were performed in 65 patients following excision of skin lesions. The patients aged between 37–99 years (average 78.6 years). The size of the defects ranged from 0.7 cm² to 57.4 cm². The donor sites were the mastoid area for small grafts and the medial upper arm for larger grafts. The donor sites were closed directly. The grafts were then quilted onto the defect with 5/0 nylon sutures to approximate the grafts to the bed. This prevents haematoma and shearing of the grafts on the bed. A thin smear of Chloromycetin ointment was applied to the graft as a dressing. FTSGs on the hands and fingers were not splinted. Post-operatively, the patients were instructed to wash gently over the graft and the ointment applied twice daily.

89% of the FTSGs were performed on the head and neck region. There were only 5 partial graft losses of which 3 sustained less than 10% partial graft loss. There were no infection or others donor site complications. Beside being cost-effective, the quilting technique is simple and easy to apply without bulky dressing that may obstruct vision and cause embarrassment. By not splinting the hand, elderly patients may mobilised unhindered. Moreover, FTSG has better cosmesis than SSG.

PR019
LONG TERM OUTCOME OF SKULL BASE SURGERY WITH MICROVASCULAR RECONSTRUCTION FOR MALIGNANT DISEASE

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Purpose The successful resection of malignant skull base disease depends on the ability to reconstruct the resulting defects to support neural structures and prevent ascending infection. We report on the long term outcome of a cohort of 53 patients undergoing skull base surgery for malignant disease with microvascular free flap reconstruction.

Methodology A retrospective review of cases treated between 1989 and 2001 was undertaken, information about demographics, histology, surgery, complications and outcome were obtained and analysed.

Results 53 patients (62% male) with an average age of 60, underwent surgery with free flap reconstruction. 56% had cutaneous malignancies, 53% involved the anterior skull base and flaps used included the radial, rectus abdominis and latissimus, the success rate being 94%. Complications occurred in 22%, no specific risk factors were identified, specifically, extensive resections did not increase the complication rate. 5 year locoregional and survival rates were 74% and 60% respectively, a positive margin significantly increased the risk of local recurrence and worsened disease specific survival, as did the grade of malignancy.

Conclusion Microvascular reconstruction enhances the successful resection of malignant skull base malignancy.

PR020
OSTEOCUTANEOUS LATERAL ARM FREE FLAP RECONSTRUCTION: A CLINICAL REVIEW AND LABORATORY STUDY

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The lateral arm flap offers the potential to reconstruct defects requiring sensate skin, fascia, tendon and/or bone in a single stage making it a versatile flap. It is reliable, versatile and has an acceptable donor site and should be considered in preference to a free fibula osteocutaneous flap in mandibular reconstruction.

We present our clinical experience of 65 patients who underwent Lateral Arm Free Flap procedures for reconstructions in the head and neck region between January 1998 and December 2005. The mean age of the patients was 57.6 years (range 21–86).

Males predominated in our series 51:14.

An osteofasciocutaneous flap, containing a vascularised segment of lateral humerus, was performed in 37%, 14% were innervated flaps, the take back rate was 9% the failure rate was 6%. Other complications included; 1 haematoma, 3 wound infections, 2 temporary nerve palsies, 1 late fracture of the humerus and 1 case of partial wound dehiscence along one of the margins of flap.

A laboratory study was also performed to compare the mechanical properties and strength of cadaveric mandible, fibula and varying thicknesses of harvested humerus.

The size of the bone required has implications for flap planning, donor site morbidity and particularly for identifying the optimum size and orientation of bone segment necessary to reconstruct segmental mandibular defects.

We present our clinical and laboratory data for the osteofasciocutaneous flap.

PR021
FREE ULNAR FOREARM FLAP: EXPERIENCE OF 180 CASES

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Background The ulnar forearm flap (UFF) is an alternative to the radial forearm flap which is associated with significant donor site morbidity. The UFF donor defect is less conspicuous, less hairy and can be closed directly or

skin grafted onto muscle bellies. This paper reviews our experience with free UFF since 1982.

Materials and Methods 180 consecutive patients undergoing free UFF 1982–2005 were reviewed. Donor site morbidity (formal assessment of hand function and cosmesis) was recorded for patients treated over the last 5 years.

Results Reconstruction with free UFF was done following extirpative head and neck surgery for malignancy ($n = 115$), lower limb defects ($n = 13$), craniofacial trauma ($n = 2$) and other conditions ($n = 50$). 1 patient (0.6%) had an anomalous superficial ulnar artery which did not prevent successful harvest of the flap. Absence of septocutaneous perforators was observed in 4 patients (2.4%). 16 flaps required re-exploration of which 12 failed (6.7%). Amongst the 53 patients treated in the last 5 years 38 donor sites were assessed (2 patients had bilateral UFF); 14 (deceased); 3 (overseas). 6 donor sites were closed directly. 9 patients had donor site complications including skin graft loss (1) requiring re-grafting, delayed healing (7) and hypertrophic scarring (1). There was widespread cosmetic acceptability, retained hand function and no ulnar nerve dysfunction nor compromised vascularity.

Summary UFF has minimal donor site morbidity and high cosmetic acceptability.

PR022

THE PEDICLED ANTEROLATERAL THIGH FLAP IN COMPLEX RECONSTRUCTION IN THE HIP AND GROIN REGION

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Significant skin defects in the hip and groin region are uncommon but complex problems. They can result from a variety of pathologies including: ablative resection of primary tumours in the hip and groin, as well as extended radical groin lymph node dissection and complications of vascular surgery. Such defects often require flap reconstruction. The anterolateral thigh flap was described by Song (1983), and has been primarily used in free tissue transfer. We present our experience of the pedicled anterolateral thigh fasciocutaneous flap as an effective regional option for cover of defects in the hip and groin region, with the advantage of a relatively low donor site morbidity.

Methodology A retrospective review of 8 pedicled anterolateral thigh flaps carried out at Nottingham City Hospital since December 2001 examining indications, demographic data, complications and outcome.

Results The indications for the flaps were: 5 to defects from extended radical inguinal dissection for fungating carcinomas, 2 to greater trochanter for soft tissue sarcomas and 1 to axillo-bifemoral graft exposed in groin. Four donor sites were closed primarily, the remaining 4 were split skin grafted. The time to complete healing ranged from 15–83 days. Hospital stay ranged from 11–55 days.

Conclusions We have found the pedicled anterolateral thigh flap to be a useful addition to the reconstructive armamentarium for the reconstruction of these difficult wounds. It has a low donor site morbidity, and can provide excellent reconstructive results.

PR023

USING THE KEYSTONE FLAP FOR RECURRENT MELANOMA PROBLEMS – AN AESTHETIC PERSPECTIVE

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The use of the keystone flap in the primary treatment of malignant melanoma is gaining in popularity, and it is ideal for large and small problems, particularly in the upper and lower limbs, where the use of conventional skin grafting techniques has recognised drawbacks and increases morbidity. However, for recurrent or in transit problems in melanoma patients, sometimes larger keystones are necessary. This provides an alternative to a forehead skin graft with its attendant problems and gives the added advantage of still allowing the possible use of radiotherapy as an adjuvant technique where appropriate.

This paper will illustrate the clinical technique involved in keystone flap reconstruction, augmented with a video presentation of sample cases. The benefits of surgical management will be discussed and the clinical results and

conclusions will be documented via a series of ten melanoma cases encompassing all sites and including recurrent disease of the lower limb.

PR024

THE LYMPHATIC TERRITORIES OF THE UPPER LIMB – ANATOMICAL STUDY AND CLINICAL IMPLICATIONS

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The lymphatic system is the defense network of the body, closely related to the venous system. Although clinically as important as the main route of the immune system the lymphatic vessels also provide the major route of cancer metastasis. Our knowledge of the lymphatic system is limited. Current understanding of the pattern of lymph channels is largely dependant on the anatomical studies of Sappey in the 19th century using mercury. These studies have not been repeated.

The aim of this study was to find a new reliable method of delineating lymph channels in human cadavers and to reappraise their gross anatomy and lymph node connections using a radiological technique.

Method We used hydrogen peroxide to identify and inflate the lymphatic vessels. The individual channels were injected with a radio-opaque lead oxide mixture and recorded on x-ray film. Each channel was meticulously dissected under the surgical microscope and its course examined in relation to the regional lymph nodes. We have applied the technique to 14 human cadaver upper limbs obtained from ten different cadavers.

Results We found that the superficial lymphatic vessels course within the subcutaneous fat in close proximity to the main subcutaneous veins. Most lymph vessels were seen to flow into one main (sentry) lymph node in the axillary region, however, some of the lymph vessels ran along the posterior forearm, bypassing the “sentry” node to reach other smaller nodes.

This study won the prestigious Plastic Surgery Education Foundation 2005 Essay Contest, Senior Award.

PR025

RAISING PERFORATOR FLAPS FOR BREAST RECONSTRUCTION: THE INTRAMUSCULAR ANATOMY OF THE DEEP INFERIOR EPIGASTRIC ARTERY

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Purpose The Deep Inferior Epigastric Artery (DIEA) perforator flap is increasingly used for breast reconstruction. Avascular necrosis of the reconstructive flap is an important complication, augmented by inadequate understanding of the vascular anatomy. Published descriptions of the DIEA in the literature all lack analysis of the intramuscular course of the perforators. This study is the first of its kind to analyse this intramuscular course and to use dissection and radiography of multiple cross-sectional planes.

Methodology The investigation was performed on 21 hemi-abdominal walls from both fresh and embalmed cadavers. Blunt dissection of the DIEA and each of its branches was performed. The radiographic component comprised intravascular injection of lead oxide, with cross-sectioning of the specimens at 1.5 inch intervals in transverse, sagittal or coronal planes. Subsequent x-rays were then taken.

Results The study provided an extensive appreciation of the 3 dimensional course of the DIEA and its perforators. The points of pertinence to perforator flap reconstruction were demonstrated: description of the periumbilical distribution of major perforators, and the variable location of penetration of Rectus Abdominis by the DIEA. Furthermore, the longitudinal and transverse courses traversed by the perforators were mapped out.

Conclusions This study provided landmark descriptions of the course of the DIEA and its perforators, focusing on the clinical relevance to DIEA perforator flaps. The perforators were found to traverse considerable transverse and longitudinal distances within Rectus, explaining the necessity of dividing Rectus during operation and providing an understanding of this intramuscular anatomy.

PR026
PREOPERATIVE DESIGN OF THE FREE AUTOLOGOUS TRAM/DIEP FLAP IN BREAST RECONSTRUCTION SIGNIFICANTLY REDUCED THE RATE OF ADDITIONAL SURGERY FOR SYMMETRY

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Purpose and Methodology A preoperative design of a free flap for breast reconstruction is described. Comparison of this method of preoperative design ($n = 42$) with standard intraoperative design ($n = 115$) was undertaken by a retrospective audit. The patients' age, medical history, weight, ptosis, reconstruction, follow up, complications and incidence of a balancing surgical procedure were recorded.

Results A total of 157 patients had unilateral breast reconstruction with a TRAM (115) or DIEP (42) flap. The mean age was 51.9 years and the mean follow up period was 20.5 months. 19/157 (12%) patients intended to have contralateral surgery at the outset to create a symmetrical reconstruction. Ten patients of the remaining 138 patients (7%) have had 'unpredicted' contralateral surgery. The 'preoperatively designed' group had a lower rate of unplanned contralateral surgery for symmetry (A: 1/37, 3%) compared to the other group (B: 8/101, 8%). The rate of secondary adjustment procedures to the reconstructed breast for symmetry was also lower in the predesigned group (3/42 (7%) vs. 16/115 (14%)).

Conclusion Although sometimes required to achieve symmetry, we conclude that contralateral surgery is unnecessary in many patients with a well designed, autologous reconstruction. In our series as a whole 18.5% of patients had contralateral surgery, which is lower than reported in the literature. Moreover, preoperative design of the autologous reconstruction to match the woman's remaining breast (Group A) reduced the rate of unpredicted contralateral surgery to 3%. There was a statistically significant difference ($P = 0.096$) in the incidence of balancing surgery.

PR027
A COMPREHENSIVE STRATEGY FOR SYMMETRY IN SECONDARY FREE FLAP BREAST RECONSTRUCTION

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Purpose The creation of a symmetrical autologous neobreast is the aim of breast reconstruction. Secondary reconstruction requires matching of volume, shape and skin envelope. We present a strategy based on a modified Canniesburn template from the native non-mastectomy breast for the consistent single stage construction of a matching breast mound using free TRAM/DIEP flaps.

Methodology A series of standardized breast measurements are taken from the non-mastectomy breast preoperatively allowing a template to be made for reconstruction of the skin envelope to the IMF. There are 3 planning scenarios:

- The template easily fits the confines of the abdominal flap
- The template almost fits the confines of the abdominal flap requiring design of a random pattern local flap from the inferior mastectomy flap based on the template
- the skin requirement is much in excess of the available skin flap, requiring the marking of breast reduction on the non-mastectomy side and remeasurement of the template on the basis of these markings

Ten consecutive patients had postoperative photographic analysis a panel rating symmetry on a scale of 1 (no match)–5 (perfect symmetry). Complication rates were analyzed.

Results Reconstruction symmetry was rated as good to excellent in all cases. We demonstrate the degree of symmetrical reconstruction that is consistently possible in the breasts with this strategy in each planning scenarios.

Conclusions We present a reproducible method of templating from the non-mastectomy breast in the majority secondary breast reconstruction using abdominal free flaps that will consistently produce good to excellent symmetry.

PR028
REFINEMENTS IN DEEP INFERIOR EPIGASTRIC PERFORATOR (DIEP) FLAP BREAST RECONSTRUCTION

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Purpose The Deep Inferior Epigastric Perforator (DIEP) flap is currently popular as a refinement of the free TRAM flap for breast reconstruction. The standard DIEP flap uses either the lateral or medial row of perforators for blood supply. In certain circumstances there may be advantages in using both a medial and a lateral perforator, but this introduces an imperative to horizontally divide and repair the rectus muscle. In other circumstances, 'supercharging' of the flap by the use of perforators on both sides of the midline may be indicated.

Methodology We present a consecutive series of DIEP flaps for breast reconstruction where all three methods (standard, medial-lateral and supercharged) are represented.

Results Twenty one DIEP reconstructions are presented. There were no flap losses and no major or minor complications. No patient required re-exploration.

Conclusions Using a medial and lateral perforator simultaneously or supercharging a DIEP flap has allowed us to perform a DIEP breast reconstruction even in women with abdominal scarring, or where the whole abdominal panniculus is required.

PR029
A COMPARISON OF VASCULAR CLOSURE STAPLE (VCS) DEVICE AND SUTURE TECHNIQUE IN MICROVASCULAR ANASTOMOSES IN FREE FLAP SURGERY

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Although the VCS device has been used for almost a decade in microvascular free tissue transfer little data exists comparing it to the gold standard of hand sewn anastomoses.

This paper sought to evaluate and compare the anastomotic thrombosis rate between two groups of patients where either suture technique or the VCS clip applicator were employed in free flap surgery, predominantly breast reconstruction surgery.

Both a retrospective and prospective analysis were performed on patients undergoing free flap surgery from 1989–2005 by two surgeons at several institutions.

Demographic data and outcome data including number and type of flap, no and type of anastomoses, thrombosis rate for different recipient vessels, and total thrombosis rates for the 2 groups were obtained.

There were over 1000 microvascular anastomoses performed over more than decade and results of this study are presented.

PR030
LATERAL NIPPLE AREOLAR COMPLEX MIGRATION FOLLOWING NIPPLE SPARING MASTECTOMY RECONSTRUCTION

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Purpose To demonstrate the prevalence of lateral nipple areolar complex (NAC) migration in immediate submuscular tissue expander reconstruction following nipple sparing mastectomy

Methodology In a retrospective study over a 3 year period, 50 consecutive nipple sparing mastectomies with immediate tissue expander breast reconstructions were analysed for lateral NAC migration. The distance of the NAC from the midline was measured prior to mastectomy and following tissue expansion. The NAC position was compared using computer digital analysis to establish the extent of lateral NAC migration.

Results The mean distance of lateral NAC migration was 1.49 cm, with a standard deviation of 1.14 cm. There was no correlation between the amount of lateral NAC migration and the volume infused into the tissue expander, the age of the patient, the mastectomy volume and the preoperative distance of

the NAC from the midline. It is proposed that lateral NAC migration occurs due to an imbalance of forces within the tissue expander pocket resulting in overexpansion of the medial skin envelope secondary to lateral expander pocket tightness. Causes of lateral pocket tightness include previous lateral lumpectomy including lateral skin excision, previous radiotherapy to the breast envelope and lateral muscle closure.

Conclusion This study shows that lateral NAC migration occurs in the majority of NSM patients undergoing tissue expander reconstruction. It is proposed that a dual chambered differential expander that overcomes lateral pocket tightness will prevent lateral NAC migration.

PR031
BREAST REDUCTION: AN OBJECTIVE METHOD OF PRIORITISATION FOR SURGERY

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Subjective methods of assessing eligibility for access to public or insurance funding for breast reduction are fraught with difficulty. With the goal of producing a purely objective method to assess priority for breast reduction, the breast volumes of 116 women on the Public Hospital waiting list were measured, together with other measurements of body size. An algorithm was developed using breast volume relative to torso size as the primary parameter and adding secondary multipliers for ptosis and asymmetry. An argument is presented in support of this algorithm. The outcome is a 'Breast Reduction Index' for each patient. Public Hospitals and insurance companies can set a value for this Index above which they will fund breast reduction surgery.

PR032
VOLUMETRIC SUBPERIOSTEAL AUTOGENOUS MIDFACE AUGMENTATION WITH OR WITHOUT RHYTIDECTOMY: A REVIEW OF 79 PATIENTS

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During the period May 2000 to June 2005, 79 patients underwent subperiosteal autogenous midface augmentation with/without rhytidectomy.

Volumetric (with rhytidectomy)

Forty nine (49) patients underwent the procedure. Age: median 51 years, mean 51.5, range 37–67 years. Smoking was an issue for 11 patients.

Primary facelift in 38, secondary in 10, tertiary in 1 patient.

Degree of skin excision was measured along 3 vectors

Vertical preauricular: median 2 cm, (range 1–2.5 cm)

Horizontal preauricular: median 1.5, (range 1–3 cm)

Post auricular oblique: median 3.25, (range 1–5 cm)

Adjunctive procedures undertaken included:- endobrow-14, lower blepharoplasty-15, upper and lower blepharoplasty-18, upper blepharoplasty-1, submental liposuction-12, lateral platysmoplasty-3.

Complications included: temporary frontal branch paresis-2, temporary upper lip dysfunction-6, infection-1.

Subperiosteal (without rhytidectomy)

Thirty (30) patients underwent the procedure. Age: median 45.5, mean 44.8, range 18–71 years. Smoking was an issue for 4 patients. Primary facelift in 23, secondary in 7 patients.

Adjunctive procedures undertaken included: endobrow-10, lower blepharoplasty-12, upper and lower blepharoplasty-3, submental liposuction-1.

Complications included: temporary frontal branch paresis-1, temporary upper lip dysfunction-3, temporary upper lip paraesthesia-3, haematoma-1.

Volumetric subperiosteal autogenous midface augmentation represents a powerful rejuvenating procedure which should be considered selectively for patients who seek improved outcomes, appreciate the components of facial aging, and accept the increased temporary upper lip dysfunction rate.

PR033
BLEPHAROPLASTY: – FAT PRESERVATION, REDISTRIBUTION AND RECONTOURING OF THE LID CHEEK JUNCTION: A REVIEW OF 307 CASES

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A total of 307 patients underwent lower eyelid blepharoplasty during the period June 2002–June 2005. Preoperative assessment identified patients with; lower lid malposition 9%, inferiorly displaced lateral canthus 27% and a deficient snap test 30%.

An arcus marginalis release and septal reset was performed in 77% of cases and this represented 81% of the open procedures and 58% of the trans-conjunctival procedures performed. Fat resection was performed in 12%.

The method used to address lower eyelid fat bulge was; Arcus release 81%, fat resection 12% other (skin only, thermocoagulation etc) 7%. Septal thermocoagulation was performed in 6% and may have been superimposed on an alternate modality of addressing the lower lid fat bulge. Skin resection was undertaken in 82% of patients overall and 93% of patients in whom a lower lid incision was performed. A total 155 ancillary procedures, in 122 patients, were performed with the aim of reinforcing the lower lid supporting mechanism. The procedures performed were; suture canthopexy 12.5%, lateral canthoplasty 15.6%, orbicularis muscle sling 10.7%, Dermal pennant 12.5%.

Post operative recovery was rapid and unremarkable in 86% of patients. The post operative recovery was prolonged to 3 months for 14% and to slightly beyond 4 months for 6% of patients due to persistent swelling or a resolving complication. All patients settled within 6 months.

The lower blepharoplasty technique, of the senior author is a safe and effective lower blepharoplasty technique.

PR034
DOES CASTRATION AFFECT CAVERNOUS NERVE GRAFT OUTCOMES?

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Purpose Iatrogenic erectile dysfunction following surgery for prostate cancer is thought to be neurogenic in origin, and attempts to improve potency following surgery have focussed on preserving, or regenerating, the penile autonomic nervous supply (the cavernous nerves CN). Testosterone is integral for normal erectile function, and has been shown in various animal models to have profound positive effects on the rate and degree of nerve regeneration. Testosterone deprivation is a key treatment for patients with metastatic prostate cancer. The present study aims to evaluate, in an animal model, whether testosterone has any effect on the regeneration of the CN.

Methodology 45 male Sprague-Dawley rats underwent bilateral CN neurotomy followed by unilateral interpositional nerve graft using the ipsilateral genitofemoral nerve. Animals were then randomised to castrate, in tact and testosterone treated arms. Three months post operatively, grafted segments were re-explored and electrostimulation was performed with intracavernosal pressure responses recorded. Grafted nerve segments were harvested for histological analysis.

Results Univariate ANOVA demonstrated a significant difference in maximal intracavernosal pressure (MICP) response between groups ??? mean MICPs were 24, 47 and 59 for castrate, intact and testosterone treated arms respectively ($P = 0.003$). Within the grafted CNs there were reduced neuronal Nitric Oxide Synthase axons in castrate animals, however total axon counts were constant across groups.

Conclusions Castration resulted in a significant reduction in erectile response to electrostimulation following interpositional nerve grafting, and testosterone treatment produced higher mean MICPs. These effects do not appear to be due to changes in axonal regeneration in differing androgen environments.

PR035
NITRIC OXIDE ALLOWS NEW APPROACHES TO ADIPOSE TISSUE ENGINEERING

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Present in vivo models of adipose tissue engineering reveal limitations of three-dimensional tissue scaffolds, e.g. insufficient differentiation of precursor cells and inadequate vascularization in the centre of the construct. This study aimed at solving these problems by analyzing the effects of nitric oxide (NO) on preadipocytes and endothelial cells (EC) in a setting as found after transplantation of a 3D biohybrid composed of viable EC and adipose precursor cells. Preadipocytes were isolated from human subcutaneous adipose tissue, cultured in DMEM/F12 with 10% FCS, and differentiated after 14 days by adding insulin, isobutylHmethylxanthine, pioglitazone, dexamethasone, and transferrin. To evaluate the influence of NO on proliferation and differentiation, the NO donor molecule DETA/NO was added. Proliferation and differentiation were measured enzymatically. In parallel, EC were isolated and cultured in RPMI 1640/20% FCS. DETA/NO was added to analyze the effect of NO on the stress response genes Bcl-2, vascular endothelial growth factor (VEGF), and heme oxygenase (HO)-1. NO combined with the conventionally used differentiation-inducing factors significantly enhances maturation of precursor cells to adipocytes. Proliferation of preadipocytes, in contrast, is inhibited in the presence of NO. Treatment of EC with DETA/NO significantly induces the expression of the antiapoptotic protein Bcl-2, the pro-angiogenic VEGF, and the antioxidative HO-1. These results emphasize the pivotal role of NO in regulating gene expression. Further, they are encouraging for applying NO-donors during transplantation of preadipocytes and EC in a 3D setting to optimize preadipocyte differentiation and stimulate angiogenesis through VEGF.

PR036
AUTOLOGOUS SERUM SUPPLEMENTATION ALLOWS NEW STRATEGIES FOR ADIPOSE TISSUE ENGINEERING

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A potential material for tissue engineering of various mesenchymal tissues are preadipocytes, stem-cell derived precursors located within the adipose tissue. This study aimed at developing an optimal protocol for proliferation and differentiation of preadipocytes in an autologous serum system which is a prerequisite for constructing an ideal biohybrid composed of viable adipose precursor cells in a 3D matrix. Preadipocytes were isolated from human subcutaneous adipose tissue and cultured in Dulbecco's Modified Eagle Medium (DMEM) / HAM's F12 (F12) or OPTIMEM medium with or without human serum (hS) or fetal calf serum (FCS). Fibronectin-coating of culture dishes for preadipocyte yield after isolation and differentiation was evaluated. Differentiation was induced by insulin, isobutylHmethylxanthine, pioglitazone, dexamethasone, and transferrin, and finally assayed enzymatically and by cell counting. Fibronectin coating did not only strongly increase the yield of preadipocytes after isolation from adipose tissue but also significantly enhanced differentiation of precursors to mature adipocytes. For optimal cell expansion, DMEM/F12 was clearly more promoting than OPTIMEM while the choice of serum had hardly any effect on proliferation. Differentiation, however, was significantly improved by OPTIMEM when human serum and not FCS was used. hS opens new and promising perspectives for adipose tissue engineering in an autologous serum system. Since preadipocytes are also capable of differentiating into a variety of other cell types, including osteoblasts, chondrocytes, myoblasts, and neuron-like cells, our findings might be guidance towards an optimized use of adipogenic precursor cells to generate these tissue types.

PR037
A NEW ROLE FOR INFLAMMATION IN ADIPOSE TISSUE ENGINEERING

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Purpose We have recently developed an in vivo murine tissue engineering chamber as part of our ongoing research into the tissue engineering of fat for reconstructive surgery. In this model new adipose tissue develops when a fat graft is included in the chamber. The graft makes no cellular contribution to new tissues but instead induces endogenous adipogenesis. This is associated with graft necrosis & an inflammatory cell infiltrate, suggesting an adipoinductive role for inflammation. To investigate this, Zymosan-A (Z), an insoluble yeast-derived polysaccharide, was used to induce sterile inflammation in the chamber.

Methodology 42 µl chambers were placed around the superficial epigastric vessels of mice & filled with Z suspended in Matrigel at concentrations from 10 to 0.001 µg/chamber ($n = 5/\text{group}$). Control chambers were included. Tissue constructs were harvested at 6 weeks & assessed to determine percentage tissue content.

Results Z induced new adipose tissue formation. Reducing the concentration of Z resulted in an incremental increase in adipogenesis ($P < 0.001$ ANOVA). Very low doses of Z were highly adipogenic. Z had a systemic effect, inducing adipogenesis in contralateral chambers not containing Z.

Conclusions We describe here a new approach to generating adipose tissue in vivo. Low concentrations of Z effectively mimicked the adipoinductive activity of a fat graft in the chamber. Higher Z doses resulted in reduced adipogenesis. Inflammatory cytokines inhibit preadipocyte differentiation but promote migration & proliferation. We postulate that low grade inflammation mobilises & recruits preadipocytes, & drives angiogenesis, but resolves sufficiently early to permit differentiation & avoid matrix degradation.

PR038
IMPROVING BONE FORMATION IN MANDIBULAR DISTRACTION OSTEOGENESIS WITH RHBMP-2

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Introduction Distraction osteogenesis is a well established method of lengthening the bones of the facial skeleton. It can be used for conditions where the mandible or hemimandible is abnormally short. Although effective, the treatment is time-consuming and there can be problems with compliance in a young patient population. The application of growth factors to the distraction gap may improve the quality of the regenerate bone, thus allowing a faster distraction rate and reduced consolidation time.

The aim of this project was to investigate the effect of rhBMP-2 during the distraction phase of distraction osteogenesis in our laboratory's ovine model.

Methods Twenty four animals underwent unilateral mandibular distraction osteogenesis. 12 animals were distracted at a rate of 1 mm/day and 12 at 3 mm/day. All animals were sacrificed on day 25 post op. Six of the animals in each rate group had an absorbable collagen sponge soaked in rhBMP-2 inserted into their distraction site at the time of their initial operation. After sacrifice the distraction sites were analysed with radiography (faxitron), measurement of the bone mineral density (BMD) by dual-energy-x-ray absorptometry (DEXA) scanning, CT scanning and histology.

Results Distraction augmented with rhBMP-2 resulted in a statistically significant increase in bone mineralization, as seen with faxitron analysis, DEXA and CT scanning. Histological analysis also demonstrated increased formation of new bone in the rhBMP-2 groups.

Conclusion rhBMP-2 appears to augment distraction osteogenesis during the distraction phase of distraction osteogenesis as assessed by histological and radiographic analysis.

PR039
TISSUE ENGINEERING OF BONE USING A CHICK CHORIO-ALLANTOIC MEMBRANE GRAFT MODEL

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Aims The chorio-allantoic membrane (CAM) of the chick is known to permit growth and to vascularise foreign tissues. We have sought to use it as a surrogate in vivo tool, to enable rapid assessment of various aspects of bone tissue engineering for craniofacial repair in the absence of the aggressive immune response mounted by other animal models.

Methodology Mesenchymal stem cells were harvested from the inguinal fat pad of adult mice, loaded onto a poly-lactic acid scaffold and incubated on the CAM for 5 days. Serial CAM grafting was also performed.

Results Around 70% of embryos remained viable. We were able to demonstrate good vascularisation of the graft and evidence of osteogenic differentiation. There was minimal inflammatory response seen.

Conclusions The CAM graft is a useful model in which to assess various aspects of bone tissue engineering including the number and concentration of cells required at loading, the effects of scaffold modification, and the ability of the construct to integrate with host vasculature. This approach is rapid, simple and allows assessment of the primary response to the construct without interference by an aggressive inflammatory response.

PR040
AUTOLOGOUS IN VIVO TISSUE ENGINEERING IN HYALURONAN-BASED SCAFFOLDS IN A PIG MODEL

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There is high clinical need for an adequate reconstruction of extended soft tissue defects as found after deep burns, tumor resection, or trauma. A promising solution for these defects is adipose tissue engineering with preadipocytes, stem-cell derived precursors of the adipose tissue, implanted in biomaterials. This study evaluated hyaluronic-acid based gels mixed with autologous preadipocytes in a pig model for their potency to generate new adipose tissue. Preadipocytes were isolated from intraabdominal pig fat by collagenase digestion, plated on culture dishes in DMEM/Ham's F12 (1:1) with 10% pig serum, expanded, and mixed with hyaluronan gel which had been modified by amidation of the carboxyl groups. Two types of gels with varying degree of esterification were tested (HYADD3, HYADD4). Cell-loaded gels (1 ml) and untreated controls (1 ml) were injected subcutaneously into the ears of the pig. Implants were explanted after 6 weeks and histologically analyzed. Both gel types were macroscopically hardly detectable after 6 weeks. Histological analyses revealed isles of mature adipocytes within the cell-loaded HYADD3-gel and vessels embedded in mature fat surrounded by gel. HYADD3-control gels did not show gel-surrounded adipose tissue. No adipose tissue was found in HYADD4 gels, neither in cell-loaded nor in control gels. Both cell-loaded gels showed a slight volume effect but only a limited stability after a 6-week implantation period. Hyaluronan-based gels represent a promising material for the reconstruction of small tissue defects. However, HYADD3 is more applicable for generating adipose tissue in gels than HYADD4.

PR041
MAST CELLS DYSREGULATE APOPTOTIC AND CELL CYCLE GENES IN HEAD AND NECK MUCOSAL SQUAMOUS CELL CARCINOMA

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Background Aggressive human cancers are commonly associated with a florid immune response, especially mast cells at the tumour periphery. The degree of mast cell activation correlates closely with distinct phases of hyperkeratosis, dysplasia, carcinoma in situ and squamous cell carcinoma. Many have taken this observation as evidence that mast cells contribute to carcinogenesis, without a cause-and-effect relationship being established.

Aim Using human mast cell line (HMC-1) and human glossal squamous cell carcinoma cell line (SCC-25), we aim to investigate the effects of mast cells on the proliferation and gene expression profile of mucosal squamous cell carcinoma.

Methods HMC-1 and SCC-25 were co-cultured in a two-compartment chamber. Passage of mediators between the compartments was unhindered, but physical interaction between the two cell types was prevented. Negative controls were established. At 12, 24, 48 and 72 hours, proliferation and viability of SCC-25 were assessed with MTT colorimetric assay. For the study of differential gene expression between co-cultured and control SCC-25, DNA microarray was employed.

Results HMC-1/SCC-25 co-culture resulted in suppression of growth rate for SCC-25 (40% compared with control, $P < 0.001$). Co-culture with HMC-1 also resulted in dysregulation of genes TNFSF10, BIRC4, CDK6, Cyclin G2 and CDC6 in SCC-25.

Conclusion Contrary to published work, we show that mast cells have an inhibitory effect on the proliferation of mucosal squamous cell carcinoma in vitro. We also demonstrate that mast cells dysregulate key genes involved in apoptosis and cell cycle checkpoints in mucosal squamous cell carcinoma.

PR042P
LOG SPLITTER HAND INJURIES: HAS ANYTHING CHANGED IN TWENTY YEARS?

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Occupational hand injuries are very common with 40% of all hand injuries being work related. Whilst log splitters are an uncommon cause of hand trauma, the injuries they cause are often serious and complex. Since the first case series about log splitter associated hand injuries in the early 1980's, little data has been collected with no Australian data available. This paper explores the types of hand injuries caused by log splitters presenting to the Royal Hobart Hospital over a three year period and compares them with previous case series. In this series we found the type and site of injury, causative factors and patient demographics were very similar to those previously documented. Additionally we found secondary surgery was often required to debride tissue which necrosed days later despite appearing viable at initial debridement. Despite the severity of injuries, all the patients with long term follow up had good functional recovery.

PR043P
THE TECHNIQUES OF AUSTRALIAN PLASTIC AND RECONSTRUCTIVE SURGEONS IN SPLIT THICKNESS SKIN GRAFTING OF THE LOWER LIMBS FOLLOWING SKIN CANCER EXCISION

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Purpose The use of split skin grafts to repair surgical defects on lower limbs after skin cancer surgery is commonplace. However, there appears to be much variation in the techniques used by different surgeons. The primary aim of this study was to assess the variety of methods used by Australian plastic surgeons when skin grafting lower limbs and to compare these methods with evidence-based literature.

Method In November 2005, questionnaires were distributed via mail to all current members of the Australian Society of Plastic Surgeons. Members were asked to return the completed survey via the enclosed stamped envelope. A literature review using the Medline and Cochrane databases was performed.

Results 119 out of 246 responses were received (48.37%). 73.5% of surgeons reported that at 1 month, skin graft take of >80% occurred more than 90% of the time. Most grafts (58.12%) were perforated. Meshing (22.22%) and laying the graft as a sheet (19.66%) were at similar rates. 78.63% wrapped the limb with bandages only, while 21.37% would place the limb in a hard splint. 24.79% of surgeons mobilized their patients immediately, 20.51% rested them in bed overnight, while 46.15% rested their patients for between 2 to 7 days.

Conclusion The overall rates of skin graft take at 1 month were similar in all states despite the variety of techniques used. Further randomized control trials need to be conducted to assess whether or not some of these practices

truly impact on the rates of skin graft take as they may increase patient morbidity, discomfort and inconvenience.

PR044P
A SURVEY OF AUSTRALIAN PLASTIC AND RECONSTRUCTIVE SURGEONS' ROUTINE USE OF DAY SURGERY

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Purpose Day surgery is becoming more routine. Plastic and reconstructive surgery is not exempt from this tendency. This study aimed to assess the proportion of plastic surgical cases being performed routinely as day surgery, the rates and causes of unexpected admissions and the perceived long-term trends of day surgery.

Method In November 2005, questionnaires were distributed via mail to all current members of the Australian Society of Plastic Surgeons. Members were asked to return the completed survey via the enclosed stamped envelope.

Findings 119 out of 246 responses were received (48.37%). Most procedures involving the excision of skin cancers (74.58%) and upper blepharoplasties (69.75%) were done as day cases >90% of the time. Conversely, abdominoplasties (73.11%), reduction mammoplasties (63.71%) and face lifts (50.42%) were routinely admitted post-operatively. Rhinoplasties, removal and replacement of breast implants, genioplasties, liposuction, lower blepharoplasties, brow lifts, mastopexies and breast augmentations had varying proportions being done as day cases depending on the state the respondent practiced in. The majority of day cases had unexpected readmission rates of 'never' or '1-24'. The main reason for unexpected admissions was 'bleeding and swelling' (66.67%). 57.26% thought that they would perform more day procedures in the next 5-10 years.

Conclusion There was much variation amongst plastic surgeons as to whether or not they routinely performed certain procedures as day cases. Rates of unexpected admissions are consistently low for those which are done as day surgery. More research is needed to compare patients' outcomes for procedures performed as day cases or inpatients.

PR045P
EARLY INTERVENTION IMPROVES OUTCOME OF AXILLARY NERVE TRAUMA

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Background Shoulder trauma not uncommonly results in axillary nerve injury that will not recover spontaneously. Current thinking is to wait at least 3-6 months prior to surgical intervention to repair the nerve.

Aims To review a series of cases of axillary nerve repair following shoulder trauma and show how early surgical intervention may improve outcome.

Methods We retrospectively reviewed six relevant patient histories particularly relating delay to surgery and clinical outcome.

Results Patients operated on earlier had better outcomes. In particular 1 case operated on at 1 month post injury showed a full recovery at 5 months post surgery.

The preoperative EMG (Electromyographic) studies correlated well with intraoperative findings when conducted and interpreted by experienced neurophysiology staff.

The operative technique uses an anterior with or without a posterior approach. An endoscope is used to visualise the path of the nerve. The nerve is either neurolysed or grafted depending on intraoperative findings. Muscle relaxant is used sparingly.

Discussion Studies show that the chance of successfully restoring muscle function post trauma is related to reducing the period of denervation. Early intervention requires the support of a preoperative EMG study to confirm the unlikelihood of spontaneous recovery.

Early surgical intervention avoids prolonged muscle denervation which leads to shoulder weakness and stiffness which are factors preventing a good outcome after these injuries.

Conclusion While larger studies are needed to support our claim, early intervention for axillary nerve damage following shoulder trauma has its merits.

PR046P
SCHWANNOMATOSIS. CASE SERIES AND REVIEW

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Introduction Schwannomatosis is a rare syndrome characterised by multiple encapsulated tumours arising from the schwann cells of the peripheral nervous system. It is a distinct entity from neurofibromatosis types one and two. We present three cases of multiple schwannomas, each showing how this rare condition can mimic more common problems, causing difficulty in diagnosis. MRI images and intraoperative photographs are also displayed.

Case 1 48 year old lady with pain and paraesthesia in a common peroneal nerve distribution. Previously a schwannoma was removed from her marginal mandibular nerve which was preoperatively thought to represent a sub-mandibular gland tumour.

Case 2 30 year old lady with a history of melanoma, presenting with an axillary mass. Scans suggested a schwannoma rather than malignant recurrence. Multiple schwannomata were removed in theatre.

Case 3 43 year old gentleman referred for varicose vein surgery. Several painful lumps on his calf were thought to represent thrombosed veins, however were found to be schwannomata after excision.

Discussion Patients can be diagnosed with schwannomatosis if they have two or more pathologically proven schwannomas with no radiological or clinical evidence of vestibular nerve tumours thus distinguishing the syndrome from neurofibromatosis type two.

Patients can present complaining of a palpable mass, pain, paraesthesia as well as weakness and atrophy. MRI imaging is the investigation of choice.

Treatment can be conservative or surgical, with surgical resection reserved for patients who have symptomatic lesions. As the lesions are encapsulated they can be removed safely by surgeons with experience of nerve sheath tumours.

PR047P
A SHEEP IN WOLFS CLOTHING: CASE REPORT AND LITERATURE REVIEW OF SWEET SYNDROME

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Case Report A 66 year old gentleman was transferred from a regional hospital with suspected necrotising fasciitis of his right hand. He presented with a forty-eight hour history of a rapidly spreading erythematous rash with necrotic haemorrhagic bullous lesions on his right thumb. During transfer this had spread to his right index finger and the dorsum of his hand. A second lesion had recently appeared on his left 1st web space.

On examination he had a dense median nerve palsy of his right hand and reduced sensation in his left hand. He described having a cold for the past few days and was being treated with cephalexin. He was pyrexial 38.5°C, tachycardic but did not look unwell. No other skin lesions were noted. He was mildly tender over his infraclavicular nodes.

Laboratory tests showed WBC 16.4 × 10⁹/L, CRP 215 and ESR 46. Over the following hour, the lesions had enlarged and blisters formed. When swabbed, no organisms were seen or cultured.

A biopsy was taken from a lesion which was consistent with Sweet Syndrome. He was treated with prednisolone and made a rapid recovery.

Discussion Sweet syndrome was first described by Robert Douglas Sweet in 1964. It is characterized by an acute eruption of painful erythematous plaques with pseudoblistering, nodules and occasional pustules. It usually follows a respiratory or gastrointestinal infection. This condition is usually discussed in dermatology journals. However, its presentation and similarity to necrotising fasciitis requires surgeons to be aware of this condition to prevent unnecessary operations.

PR048P
DOES IMMEDIATE BREAST RECONSTRUCTION DELAY THE PROVISION OF ADJUVANT THERAPY?

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Purpose Debate continues about the appropriateness of immediate breast reconstruction. Both adjuvant protocols and aesthetic results are cited as reasons to delay reconstruction until treatment is complete. This paper seeks to assess whether immediate breast reconstruction negatively impacts on the administration of post operative radiotherapy or chemotherapy. We also aim to identify high risk patients whose outcome may be adversely influenced by breast reconstruction and to determine recommendations for immediate breast reconstruction based on clinical and preoperative biopsy findings.

Methodology A 5-year retrospective review of 128 breast reconstructions performed in Christchurch Hospital by the Department of Plastic Surgery. A literature review was performed and our findings compared with historical results from other centres.

Results Results including complications and outcomes will be presented and the conclusions used to provide recommendations for those patients who are unsuitable for immediate breast reconstruction.

PR049P
PAROTID METASTASIS – AN INDEPENDENT PROGNOSTIC FACTOR FOR HEAD AND NECK CUTANEOUS SQUAMOUS CELL CARCINOMA

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Background Metastatic parotid cutaneous squamous cell carcinoma (SCC) is the most common parotid gland malignancy in New Zealand and Australia. Current TNM staging system does not account for the extent of nodal metastasis. A staging system that separates parotid (P-stage) from neck disease (N-stage) has been proposed recently.

Aim To review the outcome of patients with metastatic head and neck cutaneous SCC treated at our multidisciplinary Head & Neck Service using the proposed staging system.

Method Consecutive patients were culled from our Head and Neck Database (1990–2004) and restaged according to the proposed staging system (P0–P3 and N0–N2). Loco-regional recurrence and disease specific survival were calculated using the Kaplan-Meier method and comparison of graphs made with the log-rank test. Multivariate analysis was carried out to assess the impact of various parameters.

Results & Conclusions Of the 67 patients, 37 had parotid metastasis (of whom 13 also had neck disease) while 21 had neck metastasis alone. The remaining 9 patients had dermal or soft tissue metastasis. 67% of the patients underwent post-operative adjuvant radiotherapy. The 5-year disease-specific survival rate and loco-regional recurrence rate was 60% and 48% respectively. The presence of parotid disease was an independent prognostic factor on survival ($P < 0.01$), and P3 fared significantly worse than P1 and P2. Patients with both parotid and neck disease fared worse than those with parotid or neck disease alone ($P = 0.01$). N2 had a significantly poorer outcome than N1 ($P < 0.01$). Immunosuppression ($P < 0.01$) and a positive surgical margin ($P < 0.01$) were significant adverse prognostic factors for survival.

PR050P
TRANSCONJUNCTIVAL APPROACH TO REPAIR OF ORBITOZYGOMATIC FRACTURES: PRELIMINARY EVALUATION OF POST-OPERATIVE EYELID SHAPE AND FUNCTION

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Lower eyelid morbidity remains a significant concern following orbitozygomatic fracture repair. The transconjunctival approach has gained popularity

as a means to avoid cicatricial related complications seen following transcutaneous approaches to the lower eyelid, and has been shown to generally provide adequate exposure, with or without lateral canthotomy. Quantification of eyelid morphology following transconjunctival access for fracture repair hasn't been presented previously.

A consecutive series of 12 patients who underwent the transconjunctival approach to orbitozygomatic fracture repair without canthotomy were contacted for long-term eyelid evaluation, of which 6 presented for evaluation of eyelid morbidity and morphology. Digital photographs were enlarged to allow oversized measurements of both the treated orbit and the opposite non-operated orbit. A ratio of these values was calculated, giving the percentage difference in measured values between orbits.

The percentage difference in size between the operated and non-operated was calculated at 4 locations, including the horizontal fissure (mean change = 2.6%; range 0–4.5%), as well as 3 vertical measurements from upper lid margin to lower lid margin: mid-pupillary (mean change = 5.5%; range 2.6–9.4%), medial limbus (mean change = 6.1%; range 0–11.7%), and lateral limbus (mean change = 7.3%; range 2.9–18.5%). The largest discrepancies in vertical measurements were in a patient with pre-existing unilateral upper eyelid ptosis on the fractured side. There were no cases of ectropion, entropion, or scleral show, and there were no functional lid problems.

Our preliminary study reveals no significant change in eyelid shape or function when using the transconjunctival approach in orbitozygomatic fracture exposure and repair. The transconjunctival incision without canthotomy provides adequate exposure to treat routine fractures, and does not lead to long-term eyelid morbidity or change eyelid shape.

PR051P
RECONSTRUCTION OF STERNAL WOUNDS

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Purpose To retrospectively review our experience with the reconstruction of sternal wounds following open heart surgery at St Vincent's Hospital Melbourne from January 2001 until October 2005. Based on this experience we discuss the methods and approaches used in the management of deep sternal wound infection.

Methodology Using the information in the national cardiac surgery database, all patients who developed deep sternal wound infection following open heart surgery between January 2001 and October 2005 at St Vincent's Hospital, Melbourne were identified. These patients were then retrospectively reviewed to identify their management and what forms of reconstruction they required.

Results 18 out of a total 2147 patients (0.84%) suffered from deep sternal wound infection over this 5 year period. 5 of these patients required surgical debridement and definitive reconstruction using 4 pectoralis major flaps, and 2 omental flaps. 5 patients required surgical debridement and rewiring alone. 5 patients were managed using only a VAC dressing and antibiotics. 3 patients were managed conservatively with a prolonged course of oral antibiotics.

Conclusion Although deep sternal wound infection is a feared complication following open heart surgery, at our institution it is relatively uncommon. Reconstruction and management of sternal wounds pose particular challenges due to pedicle constraints and anatomical location. The pectoralis major and omental flap have been our flaps of choice for reconstruction. 5 of 18 patients (27%) required a definitive reconstructive procedure whilst the remainder of patients were managed using surgical debridement, VAC dressings, or a prolonged duration of antibiotic therapy.

PR052P
CHEST WALL RECONSTRUCTION – DIFFICULTIES AND STRATEGIES

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Purpose To report a challenging case of a complex chest wall problem and its reconstructive solution.

To describe the techniques available for reconstruction of chest wall problems based on the site, nature and extent of the chest wall resection.

To discuss the particular difficulties arising from chest wall reconstruction facing the reconstructive surgeon.

Case Report A 66 year old man who had undergone a right sided total pneumonectomy and 1st rib thoracoplasty as a child developed a chronic empyema in his teenage years. This was managed for several decades with an Eloesser Flap. With recent developments in chest wall reconstruction he underwent an uncomplicated resection of the Eloesser Flap, adjacent ribs, and debridement of the empyema cavity, followed by a contralateral latissimus dorsi myocutaneous free flap transfer for reconstruction.

Results We describe a single stage technique for managing a particularly difficult reconstructive problem that had been present for many years. The case highlights a number of important factors in managing chest wall problems: the difficulties of limited local and pedicle flap options, compromised vascular pedicles, the requirement to fill large compound primary defects, the issues of chest wall stability, infected spaces, and adequate support for thoracic function.

Conclusion Using a combined approach involving the cardiothoracic surgeon, and the plastic and reconstructive surgeon difficult chest wall problems can be solved with dramatically improved outcomes for patients.

PR053P DIRECT ACCESS FOR CARPAL TUNNEL SURGERY IN NEW ZEALAND

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The number of referrals for patients with carpal tunnel syndrome (CTS) greatly exceeds the capacity for review in outpatient clinics. A method of allowing direct access for surgery, and bypassing preassessment in clinic, was designed prospectively.

Methods 65 patients with CTS fulfilled entrance criteria for surgery by means of a clinical criteria diagnostic tool (Kamath & Stothard, 2003, J Hand Surg 28B: 5: 455–459). They were assessed pre-operatively and at a minimum of 3 months post-operatively by means of a symptom severity and functional status score (Levine et al, 1993, JBS, 75A: 11: 1585–1592).

Results There was a dramatic decrease in waiting time for surgery. The mean symptom severity score improved from 37.31 to 16.75; and the mean functional status score improved from 22.57 to 11.91 ($n = 45$; $P < 0.05$). All patients who returned the questionnaire would undergo the procedure again.

Conclusions With appropriate selection of patients a direct access programme can provide a good service for patients, decrease waiting times and has now become practise in our unit for CTS.

PR054P SENSORY RECOVERY POST DIGITAL NERVE REPAIR USING EARLY SENSORY REEDUCATION (TACTILE GLOVE SYSTEM)

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Aim The importance of digital nerve repairs are often over looked. This may result in a poorly functioning hand. Recovery from an incomplete and mismatched reinnervation takes time. Remapping of the cortical representation of the hand has also been proposed as an associated problem with rehabilitation.

The tactile glove uses hearing as substitute for sensibility. This method allows the start of sensory relearning long before reinnervation can be identified to try and maintain the cortical map from the affected hand, until actual sensibility has returned. This has been proven to be useful in injuries to nerves at the wrist.

Method Randomised prospective study of patients between 18 and 80 years of age, with a primary nerve repair, excluding previous hand injuries, diabetes, and steroid therapy. The assessment of digital nerve repair was made by investigating changes in 2 point discrimination, tactile gnosis, and grip function. This was done using the Semmes-Weinstein monofilaments; 2PD; S T I test; Sollermantest. Comparisons of these results were made between patients who had sensory re-educational programmes initiated several months after the repair, and those who had immediate stimuli generated by active touch (Sensory Glove system).

Results After 3 months, patients who used the Sensory Glove system appeared to have an overall better outcome than those who had delayed sensory education.

Conclusion The Sensory Glove System appears to assist in early functional sensory recovery of digital nerve repairs. This may be due to early sensory input from the hand, inspite of complete sensory loss which facilitates maintenance of the cortical hand map.

PR055P IMMUNOGLOBULIN EXTRAVASATION CAUSING FULL THICKNESS SKIN NECROSIS

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Purpose To present a case of intravenous human immunoglobulin (Intra-gram) extravasation causing full thickness skin necrosis and ulceration.

Methodology Case presentation with photographs.

Results The injury was treated successfully with minimal debridement and split skin grafting.

Conclusions Immunoglobulin solution is an uncommon cause of extravasation injury which may result in significant skin loss. Early referral for consideration of percutaneous washout is encouraged.

PR056P THE EXTENDED MEDIAL GASTROCNEMIUS MYOCUTANEOUS FLAP REPAIR IN KNEE EXTENSOR MECHANISM RECONSTRUCTION

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Introduction The medial gastrocnemius flap is a versatile flap repair for defects from anterior knee to lower tibia. We describe a flap repair for functional reconstruction of the entire quadriceps mechanism.

Methods Faced with an absent patella and patella tendon following extensive debridement for chronic osteomyelitis, the aims of reconstruction were twofold.

First to provide adequate coverage in an area of complex reconstruction.

Secondly, to recreate a functional extensor mechanism of the knee.

The Medial Gastrocnemius muscle was raised distal to musculo-tendinous junction and at point of maximal rotation anchored to anterior periosteum. The tendinous portion sutured to the remains of the quadriceps tendon.

Results Complete Flap survival and graft survival were demonstrated at 1 week post operatively. On review at 3 months complete extension was demonstrated with no extensor lag. Independent ambulation was also demonstrated.

Conclusion This technique supports the success of Jaureguito *et al.* (97)1 for reconstruction of the extensor mechanism.

Our technique is unique in two ways:

1. No myocutaneous flap has been used to repair the extensor mechanism of knee. This is more aesthetically appealing than muscular flap with skin graft.
2. No extensor lag was demonstrated. Compared with 40,50 in Jaruguito's series and 10–30' in Busfields study2.

This technique could be used in oncological surgery, such as reconstruction post resection of proximal tibial tumors.

PR057P RECURRENT SCC OF SCALP – AN AGGRESSIVE DISEASE

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Introduction The preliminary retrospective study aims to show that recurrent SCC of the scalp is aggressive and may be dependent on depth of lesion.

Methods A Retrospective analysis of 17 patients was performed using histology database to track SCC specific for scalp. Data entered included risk factors, sex, sites, depth, histology and treatment.

Results Of the 17 patients, 88% were male, and 65% had recurrence. Primary closure and split thickness skin graft were used in 28% whilst full thickness skin graft was used in 14%. 4 patients had lesions at multiple sites. Most patients with recurrence had lesions that extended into the deep dermis. There were 2 deaths from unrelated causes.

Conclusion This preliminary study suggests that SCC of the scalp is aggressive. A high rate of recurrence may be associated with depth of lesion.

PR058P

A TRAUMA CENTRE EXPERIENCE: FLAP RECONSTRUCTION OF TRAUMATIC LOWER LIMB INJURIES

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The Alfred Hospital (Melbourne, Australia) is one of the largest and busiest trauma centres in Australia and New Zealand. The aim of this study is to review and present our experience with flap reconstruction of traumatic lower limb soft tissue injuries.

This is a retrospective review of all lower limb flap reconstructions performed by the Plastic and Reconstructive Surgery Unit at the Alfred Hospital from 1 July 2001 to 20 October 2005 (51 month period). Information is retrieved from the Victorian Trauma Registry database and patient records.

Results including patient details, injury patterns and the nature of flaps utilized for soft tissue reconstruction will be presented. Complications and outcomes of lower limb injuries will be discussed and analysed. Based on our experience, a protocol for the management of severe traumatic lower limb injuries will be proposed.

PR059P

THE ROLE OF THE PLASTIC SURGICAL TEAM IN THE EFFECTIVE UTILIZATION OF THE VAC DRESSING

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The VAC dressing is an important and useful tool in wound management. When it was first introduced its use was mainly initiated by Plastic Surgeons. Over the years its use has become more widespread. Instances of inappropriate VAC usage not uncommon.

We report on our series of 25 consecutive cases in a large tertiary hospital where the use of the VAC was successfully used in wound management.

By providing a Pro active Plastic Surgery led wound care service, the use of the VAC is optimized and hence its misuse is curtailed. In all instances the VAC is used as an adjunct to definite flap or graft surgery.

PR060P

AESTHETIC RECONSTRUCTION OF SEVERE POST BURN NECK CONTRACTURES

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Severe neck contractures cause significant cosmetic deformity and functional restriction.

Restoring function and aesthetics is a major challenge.

We present 62 patients where the excision of the only the neck scar is performed together with the underlying Platysma muscle. The scar excision is designed along the lines of the triangles of the neck to restore a semblance of order to the reconstruction. This is followed by split skin grafts applied as a sheet followed by splinting of the neck.

Our method restores normal neck movement in flexion, extension and lateral rotation. The contour of the neck is restored, which imparts a youthful

profile. The hypertrophic scarring of the cheek and lip gradually settles down due to the lack of the deforming force.

No recurrence of the contracture has been observed in any patient followed upto one year.

PR061P

PREOPERATIVE EMBOLISATION OF ARTERIO VENOUS MALFORMATIONS USING ONYX

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We report our successful experience of treating arteriovenous malformations using a new liquid embolic agent, Onyx.

Under GA, the Right Femoral artery was catheterized and under radiological control the feeding vessel of the AVM of the lower lip was super selectively catheterized and Onyx was injected under radiological control. 2 days later the now successfully embolised AVM was successfully excised surgically.

Onyx is a non-adhesive liquid embolic agent that polymerizes and solidifies on contact with blood. In its solid form Onyx is black, which delineates the AVM and facilitates complete and bloodless excision. There were no adverse events. Surgery resulted in complete resection of the AVM and histopathology confirmed that the vessel wall integrity was maintained.

The successful and safe use of Onyx in treating AVM's makes it a promising agent in the treatment of AVM's.

PR062P

DELAYED PRIMARY REPAIR OF FLEXOR TENDON INJURIES IN THE HAND

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Background Opinions vary as to the optimal reconstructive techniques for flexor tenorrhaphy. However, functional outcomes are optimal with early primary repair. Delayed primary repair is defined within 24 hours – 10 days after injury*1. Thereafter, repair is considered by some as secondary (and after 4 weeks as late secondary)*1. Four weeks after injury, factors including tendon retraction and oedema, sheath constriction, 2 joint contractures and a belief that delayed repair is associated with a higher incidence of adhesions*1, have traditionally led to recommendations of staged grafting, tenolysis or arthrodesis*1. Over the past decade, the senior author has employed a novel technique of delayed primary repair using sheath dilatation, gradual tendon traction and direct repair, up to 10 weeks following injury.

Methods 20 consecutive patients underwent delayed primary repair of either Flexor Pollicis Longus or Flexor Digitorum Profundus, 4–10 weeks after injury. Injuries included 6 thumbs (avulsions: 2 zone I, 4 zone II) and 14 digits (6 zone I, 5 zone II and 3 zone III/IV). Patients were assessed using a combination of the Quick Dash questionnaire, range of joint motions and grip strength.

Results There were no delayed ruptures in our series. One thumb had a fixed flexion contracture requiring tenolysis at 4 months with a good final result. Overall, results were comparable to early tenorrhaphy.

Conclusion Delayed primary flexor tenorrhaphy can yield functional results comparable to early repair and other secondary reconstructions such as tendon grafting. In treating late presentations, the option of a delayed primary repair/reattachment should be considered.

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