

Winter Scientific Meeting 2015- Free Paper Abstracts

(abstracts are listed in alphabetical order by presenter Surname)

Management of rare craniofacial anomalies in charity missions

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Short-term medical missions (STMMs) provide a good chance for poor and difficult-to-reach patients. Thousands of physicians travel every year, to third-world countries, volunteering their time, knowledge and skills. Missionary work in the third world countries has become common practice; however, there is a lack of standardised objective evaluation tools to assess patient safety, quality control, and mission impact. Most of the participants in missionary work are well-qualified and well-trained persons. However, some other recently-graduated doctors and sometimes even medical students are tempted to participate in these missions for several reasons; one of these reasons is tourism. Although many volunteering groups collaborate with one another and with host governments, there is no formal system for coordinating or evaluating the work of so many volunteers. Several websites are describing the success and the achievements of these missions; however, little can be found about the complications that sometimes occur and are often left untreated.

Major and minor criteria for early diagnosis and treatment of Toxic Shock Syndrome in the context of a burn: A review of a cluster of cases in a regional burns unit

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Introduction and Aims

Toxic shock syndrome (TSS) is a potentially fatal exotoxin-mediated disease. Young children with burns are at particular risk. Diagnosis can be difficult because early signs and symptoms are relatively non-specific. However early empirical treatment is essential in view of high mortality rates.

We propose a new simplified means of identifying children at risk of TSS based on clinical criteria.

Method

We undertook a retrospective review of all admissions to a regional paediatric burns unit between May 2014 and April 2015. We noted patient demographics, mechanism of injury, % TBSA, depth, distribution, delay in TSS presentation, laboratory results and treatment commenced. Outcomes were measured in terms of survival and need for inotropic and/or ventilator support.

Results

Eight children were admitted with suspected TSS. Average age was 20 months, with an average of 4.5 days

between burn and TSS presentation. All admissions were treated according to local protocol with 100% survival rate. 25% required ventilator and inotropic support. 12.5% required inotropic support alone. 100% presented with signs of shock, unexplained tachypnoea and irritability. 87.5% were pyrexial >38.5°C. 75% had a rash. 50% were hyponatraemic and 12.5% were lymphopaenic. There was no positive blood culture growth.

Conclusion

We propose a combination of major and minor criteria to guide early diagnosis of TSS in children with burns.

Major criteria	Minor criteria
Evidence of shock	Unexplained tachycardia
Pyrexia >38.5	Unexplained tachypnoea
	Irritability
	Rash
	Burn within 1 week
	Unexplained hyponatraemia

In the presence of **2 MAJOR CRITERIA** or **1 MAJOR CRITERIA AND 2 MINOR CRITERIA**, a diagnosis of TSS should be considered and appropriate treatment commenced.

A simple and efficient technique for fat harvesting in lipomodelling using a paediatric suction bottle

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Introduction and aims

Lipomodelling has become a widely used technique to improve contour defects. Traditionally, fat harvest is done by using a 10ml syringe (Coleman technique) which is labour-intensive. We describe an alternative simple and efficient technique of harvesting fat using a paediatric suction bottle. In our experience, this provides better yield and quality of fat. It is also less labour intensive at a fraction of the cost.

Material and Methods

Through a small incision, the donor site is infiltrated with a saline solution including Chirocaine and adrenaline. A 3.7mm liposuction cannula is attached to a paediatric suction bottle which is connected to a suction machine set at 400mmHg. The harvested fat is then transferred to 10ml syringes and centrifuged. Any liquefied fat and fluid are discarded. The viable fat is then injected to the recipient site.

Key results

The senior authors have used this method on 124 patients from 2011 to present. In our opinion, this technique provides a gentle vacuum with a wider bore cannula than that traditionally used and yields more viable fat cells

with less liquefied fat. With this method, a total of 90mls of fat can be collected in approximately 2 minutes. The cost of the bottle is approximately £20 which is equivalent to 1 minute of theatre usage.

Conclusion

Over the last few years a number of companies have developed specific equipment for this purpose. However, these are expensive. We describe a novel technique of fat harvest in lipomodelling which is efficient and cost-effective.

Electrochemotherapy Using Intratumoral Bleomycin For The Treatment of Basal Cell Carcinoma – Single Surgeon Results 2011 - 2015

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Introduction

Electrochemotherapy (ECT) is a method by which the permeability of tumour cell membranes is increased through electroporation. With a permeable cell membrane previously administered Bleomycin is then able to diffuse in to tumour cells more easily, increasing efficacy of the drug.

Aims

To provide evidence that ECT for basal cell carcinoma (BCC) is a safe and effective treatment with comparable tumour response results to 'traditional' management such as excision, Mohs and radiotherapy.

Material & Methods

Eighteen suitable cases were identified for analysis, 12 female and 6 male patients with a total of 60 BCCs. All lesions were treated by a single surgeon using intratumoral Bleomycin (ItB) and electroporation equipment. Treatment response was classified using RECIST criteria and coded as complete response (CR), partial response (PR), stable disease (SD) or progressive disease (PD).

Results

53 lesions demonstrated CR following a single treatment, 6 Lesions showed CR following 2 treatments and 1 lesion was classed as SD - Overall CR of 98%. There was recurrence of 3 lesions (5%) which all demonstrated CR following a second treatment.

Conclusion

ECT using intratumoral Bleomycin is an effective (CR 98%) and safe alternative to 'traditional' treatments for BCC, such as excision (CR 93.8%), Mohs (CR 98.8%) and radiotherapy (CR 91.3%). To further establish its efficacy more studies need to be undertaken using ESOPE protocol and longer follow up periods to provide vigorous and reproducible results. We may then consider promoting ItB ECT to a routine treatment for BCC.

Multidrug resistant burn wound infection: establishing the causative profile and novel translatable theranostic strategies

Mr E Azzopardi (Hunterian Lecture)

Multidrug resistant (MDR) surgical site infection is a global threat to the practice of surgery. This work is the first to describe a characteristic spectrum of Gram-negative bacteria to infect burn wounds, and propose a clinically viable strategy for precision medicine at an infected soft tissue site.

Burn wound infection in different centres is traditionally thought to be caused by differing sets of organisms. However, our metanalysis of standardised bacterial incidence rates confirmed *Pseudomonas aeruginosa*, *Klebsiella pneumoniae*, *Acinetobacter baumannii*, *Enterobacter* spp., *Proteus* spp. and *Escherichia coli* as the characteristic pathogens to infect burn wounds ($F(4,20)=1.1$, $p=0.3797$; $r^2=0.984$).

To target these bacteria, I subsequently identified a common biochemical cascade instigated by these bacteria, as well as streptococcal species, *Staphylococcus aureus* (including MRSA). The cascade is a human response to bacterial invasion, which is bradykinin-controlled, leading to local vascular permeability enhancement (VPE). The mechanism allows passive accumulation of macromolecules around the site of infection, with the potential for precision medicine applications into diagnostics and therapeutics. In fact, conventional “small molecule” antibiotics cannot target specifically an infected area, distributing to unintended sites, facilitating toxicity. Leading-in work described a prototype polymer-antibiotic “macromolecular” conjugate that allows targeting to, and controlled release at, an infected site, employing a biodegradable, naturally-occurring polymer (dextrin) and a “last-line” nephro/neurotoxic antibiotic (colistin) as the first model combination. Further work has since proposed the possibility of further theranostic applications using graphene-sensor based technology.

This study is the first to establish the characteristic pathogens responsible for Gram-negative burn wound infection. It is the first to establish EPR as a clinically viable drug targeting tool in human infection, being dependent on human bradykinin being released in response to bacterial infection. It is the first to suggest that the amylase partitioning to infected areas is human in origin. These discoveries support the notion of locally-triggered, enzymatically-mediated precision medicine as a clinically relevant, widely-applicable innovation for effective treatment of multidrug resistant surgical site infection, and are explored in this presentation with thoughts from John Hunter's works.

The Modified Infra-Mammary LICAP (imLICAP) Flap for Lower Pole Breast Reconstruction: Technique and Outcome of Consecutive Series

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Introduction and Aims

The Lateral Intercostal Artery Perforator Flap (LICAP) has previously been described with a posteromedial skin island for reconstruction of lateral breast defects. Here we present an infra-mammary modification which can be laterally (imLICAP) or medially based on the thoraco-epigastric perforator (TE) which additionally allows this flap to be used in the reconstruction of lower pole and medial breast defects.

Material and Methods

The anatomy of the imLICAP and TE flaps is reviewed and the results of a consecutive series are reported. Comparisons are made with the outcomes of fat transfer.

Key Results

In 25 consecutive cases of flaps used for reconstruction of partial breast defects, 20 (80%) were laterally based imLICAP flaps and 5 (20%) were medially based TE flaps. Indications were defects following breast cancer resection (21; 84%) or to correct aesthetic deformities (4; 16%). Perforators were identified in 11 (44%) of the laterally-based flaps and in 2 (8%) TE flaps. All flaps survived.

Conclusion

The imLICAP is a reliable option for partial breast reconstruction and can be used without identification of the vascular pedicle as a reliable source of vascularised fat. The imLICAP is an advance on the traditional LICAP technique since it greatly enhances the reach of the LICAP flap, offers additional skin replacement and allows for concealment of the donor scar in the infra-mammary fold. The vascularity is robust, offers minimal donor site morbidity and has advantages in flap shaping, and aesthetic outcomes that compare well with fat transfer alone.

Throwing Good after Bad: Salvage of Sub-Optimal Free Flap Result with a Further Free Flap in Facial Re-animation - Case Series Focussing on Management of the Sub-Optimal Smile

Dr J Biddlestone, Mr S Morley
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Introduction and Aims

The surgical approach to facial re-animation in patients who have already received a free muscle transfer which has not recreated an effective smile is difficult. Free tissue transfer is seen by many as the gold standard.

We present a series of patients who received a further free muscle transfer after an initial failed free muscle re-animation procedure.

Material and Methods

The anatomy of the latissimus dorsi and gracilis flaps are reviewed with reference to their use in the salvage of a failed free flap for facial reanimation. The results of a consecutive series are reported.

Key Results

Further free flaps were performed in six patients. Facial reanimation was required for congenital (1), iatrogenic (2) and pathological (3) cause. Seven flaps had been performed previously in this group (4 gracilis, 1 rectus, 2 lat. dorsi). One patient had three free flaps in total, all others had two. All flaps were revised for poor movement. Salvage free flaps were gracilis (4) and mini lat dorsi (2). Successful free tissue transfer was achieved in 100% of cases and all patients developed a good quality, spontaneous smile.

Conclusion

Onward treatment following free flap failure in facial reanimation is a complex clinical problem since it can be difficult to know what best to offer the patient next. This case series demonstrates that a spontaneous smile can be achieved reliably by throwing good after bad and performing a further free flap. These cases present significant challenges in terms of the muscle and approach to be selected and the challenge of finding recipient vessels for microsurgery. However, these challenges are surmountable and a good quality, spontaneous smile is achievable in these patients in the long term.

Nailbed Repairs: Two centre retrospective review of patient reported outcome measures

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John Radcliffe Hospital

Introduction and Aims

Nailbed injuries are common presentations, yet scant evidence exists to validate their repair.

This work aims to:

1. Assess the effect of phalangeal fracture and splinting the repair by replacing the nail plate on the functional outcome of nail plate adherence
2. Assess the effect of replacing the nail plate and prophylactic antibiotics on the incidence of infection
3. Find out the rate of patient satisfaction and whether this is affected by a poor functional outcome

Methods

We analysed results of 163 responses to a patient related outcome measure questionnaire between January 2009 and December 2009 (Salisbury, n= 67) and July 2011 and July 2012 (Stoke Mandeville, n= 96). Follow-up time was for a minimum of 6 months after repair.

Results

Analysis using univariate and multivariable logistic regression. Those with a splinted nailbed repair were 6 times more likely to have 100% adherence in the new nail plate ($p = 0.001$). There was no significant association between underlying fractures and the amount of nail plate adherence ($p = 0.274$). There was no increased incidence of infection with a splinted nailbed repair ($p = 0.051$), the use of prophylactic antibiotics did not reduce the incidence of infection ($p = 0.632$). There was a high level of patient satisfaction (92.6% "satisfied" or "very satisfied").

Conclusions

Patient satisfaction following nailbed repair is high. Replacing the nail plate over the repaired nailbed results in a 6 times higher likelihood of 100% nail plate adherence and an underlying fracture does not affect nail plate adherence. There was no evidence that replacing the nail plate increased the risk of infection. The use of prophylactic antibiotics does not reduce the risk of infection in nailbed repairs.

Head and Neck Sarcoma; The Newcastle Experience

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Royal Victoria Infirmary

Introduction

Sarcomas occurring in the head and neck are rare and challenging to manage. We review our experience of managing these tumours as plastic surgeons, working within a bone and soft tissue MDT and present one of the largest single institution series in the world.

Methods

Data on all patients with sarcoma of the head or neck managed surgically over a ten-year period (2004-2014) was reviewed.

Results

Forty-nine patients underwent surgery for sarcoma of the head or neck. The mean age at presentation was 53.1 years. There were 37 male and 12 female patients. The scalp ($n=12$) and face ($n=18$) were the most common sites followed by the deep tissues of the head ($n=12$) and the neck ($n=7$). Histological diagnosis was varied. Leiomyosarcoma ($n=6$), angiosarcoma ($n=9$), synovial sarcoma ($n=4$), sarcoma of no specific type ($n=5$) and rhabdomyosarcoma ($n=5$) were the most frequently seen tumours.

All were treated by wide excision. Excision margins were histologically complete in the majority ($n=43$). Reconstruction was undertaken as follows: direct closure ($n=12$), local flap +/- skin graft ($n=12$), free tissue transfer ($n=21$), pedicled flap +/- skin graft ($n=3$), skin graft ($n=1$). Twelve patients received adjuvant chemotherapy and fifteen patients received adjuvant radiotherapy. Ten patients developed local recurrence and nine patients developed metastasis. Eleven patients died of their disease; mean survival 17 months.

Conclusion

Head and neck sarcomas are rare and challenging to manage surgically. Successful outcomes can be achieved by early, aggressive resection and appropriate reconstruction within the specialist MDT setting.

The Epidemiology and Mortality of PreTibial Lacerations

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Queen Victoria Hospital

Pretibial lacerations are common injuries which have an underestimated mortality associated with their occurrence, and an under-appreciated morbidity associated with their treatment – they account for 5.2 out of every 1000 emergency department attendances in the United Kingdom, and occur mostly in the elderly.

They are also increasingly being referred to plastic surgery units – the authors' department saw an increase from 58 referrals in twelve months in 2005/2006 to 113 referrals in six months in 2011. The Queen Victoria Hospital, East Grinstead, follows an evidence based and multi-disciplinary practice for the treatment of these injuries.

The authors present the outcomes of patients referred to the hospital from the community and treated according to these guidelines, and compares the outcomes and mortality to a period prior to the introduction of this practise. The average time for skin grafted wounds to heal is found to be 59.8 days and for the donors it is 50.3 days, compared with an average time to healing of 123 days for those managed conservatively. The one month and one year mortality associated with these injuries is highlighted, as is the reduction in these figures following the adherence to the current treatment regime – prior to its introduction the 31 day mortality was 15%, and this was reduced to 4.3% by achievable changes in practice and treatment. Finally, the relevant extant research literature regarding pretibial lacerations is reviewed.

The short skin hook - an aid to haemostasis in skin surgery

Miss L Carys, Mr J Morton

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It was the senior author's observation that trainees find haemostasis during skin surgery problematic, particularly at sites such as the scalp and the nose. Firstly, the bleeding is too brisk to permit visualisation of the incised vessel. Secondly, the vessel retracts into the cut skin edge which to an extent also curls downwards because of the elastic tissue in the incised dermis. It becomes impossible to apply the diathermy tips accurately and much tissue damage may ensue. Suction is of little value.

The senior author's technique, which is undoubtedly not unique, involves the use of a skin hook in the left hand. This enables vertical stretching of the skin to visualise the vessel whilst applying pressure on the vessel downstream with the ring or little finger. This simple technique allows for complete control and visualisation

of the vessel and allows diathermy with pinpoint accuracy. The difficulty however is that the standard skin hook is not designed to be used in this manner and necessitates manipulating it at its thin wire neck. The senior author's solution to this has been to design a novel short skin hook which makes this task considerably easier. The video demonstrates the hook in action.

Outcome of costochondral grafts in mandibular reconstruction

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Australian Craniofacial Fellow

Introduction

This study reviewed the outcome of costochondral grafts (CCG) used in mandibular reconstruction at the Australian Craniofacial Unit (ACFU), Adelaide.

Materials and Methods

The database of the ACFU was reviewed and patients requiring costochondral grafts as part of their mandibular reconstructions were identified. Data was collected on patient demographics, indications for surgery and outcome.

Results

Fifty-eight patients (25 male:33 female) were identified, with a mean age of 11.4 years (range: 4 days- 59 years and 11 months). The commonest conditions included 23 cases of temporo-mandibular joint ankylosis (trauma: 16, congenital: 3, infective: 3), 13 cases of Goldenhar's syndrome and 16 cases of hemifacial microsomia. The mean age at surgery was 13 years 7 months (range: 10 months- 61 years7 months). The mean follow-up time was 7 years 6 months (1 month- 18 years 6 months). The access for costochondral graft insertion were bicoronal incision (22), bicoronal and submandibular (12), pre-auricular(11), unicoronal (9), submandibular (8) and intra-oral (2). Complications included infection (4), re-ankylosis (6), graft overgrowth (3) and palpable screw (2). Four patients required repeating of the CCGs, 4 required silicone arthroplasties following re-ankylosis, 2 patients needed manipulation under anaesthesia (MUA), and 1 patient needed a MUA.

Conclusion

The use of CCGs in mandibular reconstruction is valuable and versatile. The management of potential complications allows the surgeon to maintain the construct, making it a valuable tool.

Functional outcomes following pharyngolaryngectomy; the incidence of stricture, fistula, and dysphagia between partial and total reconstruction

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Introduction

The aim of this study was to retrospectively review the stricture and dysphagia rate between primary and salvage (failed primary chemoradiotherapy) partial and total pharyngolaryngotomy (PL) reconstructions.

Methods

A retrospective review of 40 patients who underwent PL and reconstruction during 2006-2013 was performed. Patient demographics, treatment modality and adverse functional outcomes were recorded.

Results

Forty patients had PL; 33 patients had total PL and seven partial PL. Of these 22 (55%) were primary, 13 (32.5%) salvage and five (12.5%) not specified. Five strictures were treated; four were in the primary group (18%) and one in the salvage group (7%). The four primary group strictures had adjuvant radiotherapy. In the primary group 10 (45%) patients had adjuvant radiotherapy, 10 (45%) had adjuvant chemoradiotherapy. Three (13%) patients in the primary group developed a fistula versus five (38%) in the salvage group. Five (22%) patients in the primary group had dysphagia compared with seven (53%) in the salvage group.

Discussion

There is no major difference between the outcomes seen in primary and salvage PL. However, the fistula and dysphagia rate in salvage cohorts were higher. More strictures were observed in irradiated primary cases. Primarily reconstructed patients regularly have post operative adjunctive radiotherapy and may also have chemotherapy, as such these patients are at a higher risk of stricture. Conversely the salvage patients are trending towards being more at risk of fistula due to pre-existing radiotherapy damage.

Conclusion

Increasing numbers of patients are treated initially with chemoradiotherapy. These patients appear to be at increased risk of fistula, dysphagia and strictures.

Developments in a facial aesthetics outcome tool for scoring cleft surgery: human and computer-based assessments

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Introduction

High quality aesthetic outcomes are of paramount importance to children growing up after cleft lip and palate surgery. Appearance affects every aspect of their lives – physical, social and emotional. Establishing a validated and reliable assessment tool for cleft professionals and families to use will facilitate techniques, surgeons and protocols to be compared. Our first project identified exemplar images for a 5-point aesthetic scale. This study scores lips and noses as separate units and compares those human scores with a computer-based score.

Method

Seventeen cleft surgeons nationally and 28 other cleft professionals from the South West Tri-centre units scored 25 photos, uploaded randomly onto a web-based platform, twice. Each photo was shown in 3 forms; lip and nose together, and the subunits cropped separately as nose only and lip only. The same images were analysed using the Symnose© computer programme. Professional statistical analysis was used.

Results

Scoring lips gave the best intra- and inter-rater reliabilities. Nose scores were more variable. Lip-scoring associated most closely with the whole image score. Symnose© ranking of the lip images was highly related to the same ranking by humans ($p = 0.001$). The exemplar images maintained their stable, previous ranking.

Conclusions

Images illustrating the aesthetic outcome grades are confirmed. The lip score is reliable and seems to be the major determinant of the whole image score. Noses are much harder to score reliably. It appears Symnose© can score lip images very effectively by symmetry. Further use of Symnose© will be investigated and families of children with cleft will be recruited to trial the scoring system.

Merkel Cell Carcinoma. A Case series and long-term outcomes

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Royal Victoria Infirmary

Introduction

Merkel cell carcinoma (MCC) is a rare and aggressive neuroendocrine cutaneous tumour which is three times more likely to be fatal than malignant melanoma. Limited data exists to guide treatment and management plans despite its incidence increasing. We report our experience in a single unit over a 13-year period.

Methods

A retrospective case note review was undertaken with patients identified from a prospective histopathology database. Patient demographics, tumour characteristics and treatment modalities were examined.

Results

Forty-six patients were included with a mean age at diagnosis of 82.7 years (range 63-104) - 28 females and 18 males. The most common primary site was the head and neck (59%) followed by lower limbs (28%). Mean symptom duration was 10.9 weeks. Following formal diagnosis 45/46 underwent definitive surgery with excision margins ranging from 4mm – 3cm. Following MDT discussion, 48% of patients received adjuvant chemoradiotherapy for either primary or distant disease. Twelve patients presented with palpable nodes of which 8 received lymph node dissection. Sixteen patients (38%) had recurrent disease; 7 local (44%); 6 nodal (38%) and 3 metastatic (19%). A general increase in incidence of new cases diagnosed was observed; between 2002-06 the mean was 1.6 cases per year compared to 2010-14 with 6.6 cases. Five-year survival was 45% with a 3-year disease free survival of 52%.

Conclusions

To our knowledge this is the largest UK single-centre MCC study to date. Our results show that MCC is a disease of the elderly population whose incidence is on the rise in the past 13 years. Collaboration between UK centres on treatment and outcome measures may improve overall management in the absence of robust prospective randomised controlled trials.

Microsurgical Reconstructions for Head & Neck Cancers in Elderly Aged >80 An analysis of surgical outcomes and quality of life

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Background

The rising incidence in primary Head & Neck (H&N) cancers in the elderly presents a dilemma regarding the appropriateness of complex surgery in this assumed frail age group. With limited data on surgical morbidity, survival and patient quality of life (QoL), this analysis aimed to broaden the understanding of safety and effectiveness of microsurgical treatment in very elderly H&N cancer patients.

Methods

A prospective database analysis was used to evaluate surgical outcomes (morbidity, survival and QoL) in all patients aged 80 and above undergoing microsurgical reconstruction for cutaneous and intra-oral H&N cancers between 2004 and 2014. Outcomes were assessed for their association with surgical, tumour and patient variables. Co-morbidities were categorized by the ACE27 index and post-operative morbidity by the Clavien-Dindo scoring system. QoL was analyzed using the UW-QOLv4.

Results

Out of 720 microsurgical reconstructions, 96 patients were identified. Median survival was 25 months. The ACE27 index was the only variable significantly associated with survival with a 5-year survival of 59.2% in the least comorbid group vs 19.7% in the most comorbid group (p 0.015). ACE-27 showed influence on socio-emotional QoL scores. Physical QoL scores were influenced by tumour and operative factors. Patients were found to value physical QoL over socio-emotional.

Conclusion

Microsurgical reconstructions are well tolerated in the very elderly patients and should be considered predominantly based on comorbidity. Tumour stage, flap type and cancer site should still form part of the pre-operative counseling due to their implication on post-operative physical function.

The Norfolk & Norwich Head & Neck Risk Assessment Tool - A Novel Method for Predicting Early Post-operative Complications in Reconstructive Head & Neck Surgery

Miss E Dimovska, Mr J Clibbon

Norfolk & Norwich University Hospital

Introduction and Aims

Significant national variations exist in the routine postoperative monitoring of head & neck free flap patients. A standardised evaluation for assessing the determinants of immediate post-operative complications, and thus need for monitoring these patients in an intensive care setting, has previously not been proposed. This study aimed to develop a risk assessment tool to aid this decision making process by predicting early post-operative complications.

Material and Methods

183 patients requiring free flap reconstruction for head and neck cancer were identified between from the Norfolk & Norwich University Hospital. A risk score was retrospectively assigned using our risk assessment tool based on tumour site, tumour stage, and necessity of neck dissection, patient co-morbidity and length of surgery. A scoring threshold for requiring intensive care monitoring was calculated and individual patient scores were compared to predicted complications and actual events.

Results and Conclusion

Using statistical methods, this study retrospectively validated a novel risk assessment tool. Patients awaiting head and neck free flap reconstruction can accurately be assigned a pre-operative risk score for immediate post-operative complications, predicting their individual need for intensive care monitoring post-operatively.

Implementation of BAPRAS Body Contouring Surgery Guidelines Following Massive Weight Loss: A National Commissioning Survey

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St George's Hospital

Introduction and Aims

More than 70% of massive weight loss (MWL) patients seek reconstructive body contouring surgery (BCS) to improve functional and social wellbeing. BAPRAS produced NICE-accredited national commissioning guidelines for BCS in March 2014 to standardise referral pathways and eliminate the postcode lottery.

The aim of this study was to determine uptake of the guidelines by clinical commissioning groups (CCG's) in England.

Materials and Methods

Chairmen of all 211 CCG's were contacted by email in January 2015 to complete a survey on commissioning of BCS after MWL and/or provide funding guidelines.

Results

108 responses from 211 CCG's (52%) were received. 66 CCG's fund BCS after MWL (61%), and 39 CCG's were aware of the new guidelines (36%). Only 8 CCG's (7%) had implemented the guidelines, with 81 CCG's (75%) identifying local funding guidelines. Only 2 respondents stated how many cases were approved in the past year (7 cases in total), including abdominoplasty, apronectomy and mastopexy.

To improve patient access to BCS; 56 of 75 respondents (75%) thought patient reported outcome measures were key; 58 of 65 respondents (89%) stated cost-effectiveness; 46 of 66 respondents (70%) wanted development of a national standardised obesity surgery framework (CQUIN), with BCS assessment as an incentivised performance outcome.

Conclusions

Independent development of guidelines throughout NHS England is wasteful and unnecessarily replicates work. Wider dissemination of best available evidence with BCS guidelines is imperative to inform patients, GPs and CCG's. This would allow patients a real chance to re-integrate finally into society as healthy contributing individuals.

Mons pubis ptosis: classification and strategy for treatment

Professor H Elkhatib

Hamad Medical Hospitals

Background

Obesity and massive weight loss cause bulging and ptosis of the mons pubis. The pubic area can cause an embarrassment to patients. In some cases, the deformity can be seen even under clothing. Ptosis of the mons usually is addressed during abdominoplasty. The author presents a new clinical classification of mons deformity based on the amount of adipose tissue deposit and the degree of ptosis. A strategy of treatment to achieve a proper rejuvenation of mons deformities is provided.

Methods

Between 2004 and 2015, a total of 172 patients with pendulous bellies and mons pubis deformities underwent

abdominoplasty and lifting of the mons. A technique using a dermal-fascial suspension with permanent sutures to hang the weight of the mons skin and subcutaneous tissues on the musculoaponeurotic system of the lower abdomen is described. The age of patients undergoing the operation ranged from 20 to 53 years. During the follow-up period (12-38 months), all the patients by the author, who reviewed their medical charts. A Likert scale and an evaluation questionnaire were used to assess the aesthetic outcome of mons lifting.

Results

All the patients who underwent lifting of the mons pubis were free of postoperative contour deformities and had a long-lasting outcome. At this writing, patient satisfaction has remained high.

Conclusion

The clinical classification and treatment guidelines reported are designed to provide simple procedures with minimal complications that have tremendously rejuvenated the mons.

Translation of Advanced Space Technology to Burns, Trauma and Aesthetic Medicine

Dr T Frame, Dr T Harle, Professor P Dziewulski, Dr M Hardman, Ms H Wilkinson, Ms R Crompton, Mr T Wantock

Fourth State Medicine Ltd

Advances in technology and innovation across non-medical sectors have a history of impact in the medical domain ranging from the laser to advanced materials, and even advanced robotics for use in surgery and prostheses. In 2012 the founders of Fourth State Medicine developed a novel technology using skills and knowledge gained at the cutting edge of the space sector. The result was a new proprietary form of ionised gas plasma (the fourth state of matter) that produces a range of therapeutic effects that can offer an array of treatments crossing medical disciplines. This has been packaged into a hand held pen that can safely reduce bacterial load within seconds without damaging tissue at a low intensity, or at higher intensity can remove layers of tissue.

In the work to date this device has shown promise in its application to wrinkle and fine line reduction, along with other applications such as eradication of MSSA and *P.aeruginosa*. It has also shown promise in the reduction of established biofilm, which has significant potential in the burns and chronic wound sectors to improve the quality of life for a range of patients.

In this paper we present the technology, giving an overview of its technical innovation and how it generates and achieves its new form of plasma. We then move on to present pilot data for the aesthetic application to fine-lines and wrinkles before discussing pilot study results for the sterilisation and reduction of bacterial load and biofilm. We conclude with a broader overview of the exploitation plans and future development activities.

Enzyme Activated Drug Eluting Hydrogels Delay Rejection in a Novel Orthotopic Model of Swine Forelimb Vascularized Composite Allotransplantation

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Southmead Hospital

Introduction

Vascularized Composite Allotransplantation (VCA) can restore form and function in previously unreconstructable injuries. VCA is restricted by systemic immunosuppression conferring morbidity and mortality to support a graft that is not lifesaving but improves quality of life.

Anti rejection therapies that target the allograft can potentially reduce systemic toxicity. We investigated, in a novel swine orthotopic forelimb VCA model, a “smart” drug delivery system that releases immunosuppressive drugs in response to acute rejection (AR). This utilises a unique large animal model of VCA with clinically translatable opportunities to study immunosurveillance and functional recovery.

Methods

Experimental groups were as follows –

Controls	2
Intervention	6

Tacrolimus eluting hydrogels, responsive to matrix metalloproteinases 2 and 9 released by activated macrophages during AR, were implanted in transplanted forelimbs after surgery. Systemic levels of tacrolimus were measured and limbs were evaluated clinically and histopathologically for AR.

Results

Control limbs underwent Banff grade 4 AR by POD 6. 5 of 6 intervention group limbs showed no signs of clinical or histopathologic signs of AR at 4 weeks. Animals ambulated freely immediately postoperatively on transplanted limbs. At end point, systemic trough levels of tacrolimus were negligible (mean 1.2ng/ml).

Conclusions

Targeted application of tacrolimus, using enzyme responsive hydrogel delivery, significantly delays rejection of VCA grafts in a translatable forelimb model.

This novel model is uniquely powerful by enabling the study of VCA immunology not only in terms of immune rejection, but also functional recovery and nerve regeneration.

Development of POSS-PCU nanocomposite polymer for auricular reconstruction

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Introduction

Current surgical reconstruction of auricular defects involves harvesting rib cartilage and carving a new cartilaginous framework, causing donor site morbidity and is restricted by tissue availability. The use of alternative synthetic materials is also limited due to the complications relating to poor tissue integration and angiogenesis, leading to extrusion and infection.

Aims

We aim to meet this clinical challenge by creating a new material for auricular reconstruction using a novel nanocomposite polymer called polyhedral oligomeric silsesquioxane poly(carbonate-urea) urethane (POSS-PCU), which has already been successfully taken to the clinical benchside as a replacement trachea, tear duct and vascular by-pass graft.

Materials and Methods

The chemical, structural and mechanical properties of POSS-PCU has been investigated and characterised to ensure it is suitable for auricular reconstruction. The biocompatibility of POSS-PCU has been tested with several cell lines and using *in vivo* animal models.

Results

POSS-PCU was found to support cell adhesion, proliferation and extracellular matrix formation of human dermal fibroblasts, endothelial cells, chondrocytes and adipose stem cells, using QT-PCR and immunocytochemistry. The subcutaneous implantation of POSS-PCU demonstrated good tissue integration and vessel formation over three months without infection and extrusion.

Conclusion

POSS-PCU has shown to be a promising material for auricular reconstruction. Preclinical testing will be completed in the near future prior to embarking on a UK multicenter clinical trial.

Plastic Surgery Trainees Awareness of the British Orthopaedic Association Standards for Trauma – Guidance on Peripheral Nerve Injury

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Introduction

The BOA published standards for management of traumatic nerve injury in 2011. A survey by the senior author demonstrated that no orthopaedic trainees within a deanery were cognizant of these, and 40% unaware of local pathways for nerve injury referral. In many units nerve injuries are managed primarily by plastic surgeons, we wished to assess our trainees familiarity with assessment and treatment of such conditions.

Methodology

A short survey questioning awareness of the guidelines, as well as knowledge of clinical assessment and management of peripheral nerve injury, were completed before, and at the completion of, two regional

teaching sessions of North West Plastic Surgery trainees delivered a month apart by brachial plexus/peripheral nerve surgeons.

Results

47% of registrars were aware of BOAST5 guidelines before the initial teaching session, and 100% of those in attendance to the teaching sessions afterwards. Initially 42% of registrars were unaware of the local pathway for referral of peripheral nerve injury within the region. As with the orthopaedic cohort, clinical ability to assess nerve injury improved with seniority and after focussed teaching.

Conclusion

National trauma guidelines provide a benchmark against which practice can be audited. We believe that these policies, as well as local protocols need to be widely distributed and be the topic of specific teaching within a training system.

Innovation: Detection of perforators using a commercial smartphone thermal imager

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Introduction and Aims

Thermal imaging detects infrared radiation from an object, producing a thermogram that can be interpreted as a surrogate marker for cutaneous blood flow. To date, high-resolution cameras typically cost tens of thousands of pounds. The FLIR ONE™ is a commercially available smartphone compatible miniature thermal imaging camera that currently retails at under £170, marketed to the amateur home user. In a proof-of-concept study, patients and healthy volunteers were assessed with thermal imaging for: 1) detection and mapping of perforators; 2) defining of perforasomes; and 3) free flap monitoring.

Material and Methods

To assess the sensitivity for perforator mapping, perforasome delineation and free flap monitoring, volunteers and patients were imaged in various clinical scenarios. A short period of "acclimatisation" was employed to reduce background thermal interference.

Key results

Multiple cutaneous perforators, as signified by hotspots on the thermal images were identified, and subsequently aided handheld Doppler ultrasound localisation. Intra-operative images allowed accurate delineation of perforasomes, and post-operative monitoring was enhanced.

Conclusions

Thermal imaging provides an indirect non-contact method of vascular imaging without the need for ionising radiation or intravenous contrast agents. Pre-operative, intra-operative and post-operative thermograms can assist in the planning, execution and monitoring of free flaps, and the FLIR ONE™ provides a low cost adjunct than could be applied to other areas of burns and plastic surgery. It provides a quick screening tool that can be performed in the clinic with minimal training and can be carried in the pocket for ease of access.

Optimising outcomes in pedicled free-styled perforator flaps: Learning from an experience of over 100 cases

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University Hospital Birmingham NHS Trust

Introduction

Free-styled pedicled perforator flaps are fast becoming part of the reconstructive armamentarium in plastic surgery practices around the world as they provide a simpler alternative to small- to medium-sized free flaps. In this prospective study, the factors which predict their outcomes are looked at, alongside technical modifications to further refine these flaps.

Patients & Methods

In a prospective study of over 100 cases of pedicled free-styled perforator flaps from 2011 to 2015, the outcomes of these flaps were looked at in terms of overall flap survival, partial necrosis rates etc. The factors such as perforator diameter, perforator length, flap dimensions, demographics, torsion angle etc. were among the parameters studied and statistically correlating this with the final outcome. The impact of flap modifications were also analysed.

Discussion

Statistical analyses of the flap parameters indicate that dense perforator zones, perforator diameter and torsion angle were predictive of complete flap survival while the addition of co-morbidities also serve to diminish the probability of success. Based on this, the 'two-hit' hypothesis and the 'incongruous vascular arcade' model are put forward as a way of deepening our understanding of perforator flaps.

Outcome of closed metacarpal fractures managed non-surgically

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Introduction

Metacarpal fractures are relatively common hand fractures. Although the treatment algorithm is guided by the clinical picture, location of the fracture, the stability of the fracture, as well as the resultant deformity many metacarpal fractures do well without surgery. There is a paucity of literature and persistent controversy to guide hand surgeons on the best treatment algorithm.

Aims

The aim of this study is to find out the overall outcome of closed metacarpal fractures managed non-surgically and related factors that affect outcomes.

Materials and Methods

This retrospective study comprises of 155 patients who had closed metacarpal fractures managed nonoperatively in Pinderfields General Hospital from October 2013 to December 2013. Data was collected from notes, reviewing X-rays; hand therapy outcome forms, telephoning patients. Data was then analysed in Excel spreadsheet.

Results

Half of the patients were aged 16-30 years. There were six times more males than females. More than one third of patients were smokers. 50% of the fractures were caused from punches. Most of the patients were right hand dominant and commonly injured. About half were little finger fractures with common site has been the neck. 88% of patients got the full range of movement; rest of them had some degree of movement restriction. Over all 90% of patients were happy with their outcome both functionally and aesthetically, 5% satisfied with function.

Conclusion

Non surgical management of closed metacarpal fracture showed a very good functional outcome and patient satisfaction. But proper assessment, patient selection and hand therapy follow up is important.

Soft tissue groin sarcoma: Reflecting on a regional experience

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Introduction

Soft tissue sarcoma is relatively rare and accounts for less than one percent of all cancers. The groin, being the preserve of no particular surgical discipline, represents a significant challenge for the multidisciplinary team (MDT) concerned with the management of sarcomas when they develop in this region. We present our experience of managing patients with groin sarcomas in the North of England Bone and Soft Tissue Tumour Service.

Methods

All patients diagnosed with groin sarcomas between 2004 and 2015 were included.

Results

Forty-eight patients were identified, all but one was male with a median age of 64 years (17-94). 47% of tumours were spermatic cord lesions. The median tumour size was 100mm (6-270mm). 29% of tumours were Trojani grade 3, 39% grade 2 and 31% grade 1. Liposarcoma's were most common accounting for 33% of tumours

followed by leiomyosarcomas (22%). Thirty-seven (77%) of patients underwent resection with 17 VRAM, 6 ALT and 2 gracilis pedicled flap reconstructions performed. There was only one partial ALT flap loss.

19 (40%) of the cohort required radiotherapy with local control achieved in all but 2 of the 37 patients having surgery within our care.

We present further surgical outcomes including local control, metastasis-free survival, disease-related death rates and follow-up status.

Conclusions

Soft tissue sarcomas are best treated within a specialist MDT where management follows agreed oncological protocols aimed at improving outcome. Our experience forms the largest case series reported in the medical literature and highlights difficulties in early detection and referral of these rare tumours. Based on our experience we present our updated referral criteria for groin masses.

Planning Augmentation Mastopexy. A Review of 255 cases and a Proposed Algorithm

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Purpose

The combination of mastopexy and breast augmentation (BA) is one of the most challenging procedures. We propose a system of classification of breast ptosis and relevant algorithm to plan our surgery.

Material and Methods

According to the classification, the breast ptosis is classified in four grades, taking into account the position of the nipple in centimetres related to the projection of the inframammary fold (IMF) to the breast.

Grade 1: the nipple is 1 or 2cm above the IMF,

Grade 2: the nipple is at the level of the IMF or 1cm or 2cm below it,

Grade 3: the nipple is 3 cm below the IMF fold,

Grade 4: the nipple is 4 cm or more below the IMF.

Moreover every grade has another two subdivisions considering the distance of the nipple to the inframammary fold under maximum stretch. The subdivision a: when the distance from the nipple to the IMF under maximum stretch is less than 9cm and the subdivision b: when this distance is more than 9cm.

Based in this applying new classification we provide an algorithm for managing ptotic breast with only BA (32 cases) or simultaneous mastopexy (peri-areolar (38), circumvertical (45) or Wise pattern technique (39) and BA or two stages mastopexy and BA (101).

Results

From December 2004 to December 2014 255 patients with breast ptosis were treated. We had a 15% revision

rate following the one stage procedures and 7% revision after the two stages procedures. No major complications were observed.

Conclusions

The proposed system for staging of breast ptosis and the relevant algorithm are very useful tools in planning this type of surgery. Both have been very helpful in determining which breast is suitable only for BA or when to perform one stage or two stages mastopexy techniques in combination with BA

Electrochemotherapy: a new treatment option for cutaneous metastases in the South West. Results of a combined retrospective and prospective study of clinical efficiency and patient reported outcomes

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Introduction

Cutaneous metastases are present in up to 10% of cases where metastatic spread of cancer is observed. Electrochemotherapy (ECT) is a new treatment modality which appears to be very successful at managing such lesions. Specialised transcutaneous electrodes are used to deliver controlled electric pulses which make cells in the treated area permeable to the chemotherapy agent administered locally or systemically.

Study aims

We set out to obtain clinical efficiency data for ECT treatment provided in Exeter between June 2013 and July 2015. Quality of life (QoL) measurement was undertaken to expand the scope of our study.

Materials and methods

Data was collected retrospectively for 35 cases and prospectively for further 11 cases. Clinical photography of the treated lesion was used to draw conclusions on treatment efficiency whilst skin cancer-specific patient reported outcome measures (PROMs) provided us with QoL information.

Key results

Good response to ECT treatment was seen in majority of cases (66-99% reduction in lesion size seen in retrospective data - this varied depending on histological type of the primary cancer). The treatment was well tolerated with a relatively low incidence of peri-operative complications. QoL data analysis is currently pending (target: mid-August)

Conclusion

ECT is a promising new treatment modality for patients with cutaneous metastases. It is well tolerated and produces good clinical outcome. Further studies on its efficiency in various histological types of cancer are needed. Given the palliative character of the target population, QoL data should be collected in future studies to establish personal impact of ECT treatment on the patient.

Outcomes (speech, facial growth, surgical burden of care) in a consecutive series of thirty-six 15 year olds with UCLP undergoing protocol care with a multidisciplinary team and two surgeons

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Introduction and aims

Current standard UK cleft care demands multidisciplinary protocol care from diagnosis to adulthood. This study examines the results of such care by one cleft team. Outcomes in speech and facial growth and the number of cleft related surgical procedures undergone by patients aged 15-19 years will be presented.

Methods

Thirty-six children born between January 1998 and December 1999 and presenting consecutively with complete UCLP were identified from the records of the West Midlands Cleft Centre. All cleft related surgical procedures carried out were identified. Speech, facial growth and appearance outcomes, recorded routinely at age 5 years and at age 15 years, were reviewed.

Results

All children had two procedures by one surgeon (cleft lip repair only followed by closure of the hard and soft palate with a radical muscle dissection) before the age of 1 year and an alveolar bone graft by a second surgeon. Eighty-nine percent of the children required further surgical procedures, including dental treatment under general anaesthetics (75%), hearing surgery (53%), Furlow palatoplasty (42%), direct fistula repair (33%) and surgery for appearance (44%). In 38% of the cases orthognathic surgery was performed or advised. Speech outcome at 15 years was good for all patients.

Conclusions

These results are similar to those published by Schnitt et al, 2004. Overall outcome at discharge was good, yet children have to endure many procedures to achieve this outcome. Documentation of treatment throughout growth and long term outcomes is necessary to develop good evidence for improvements in care and requires protocol care and collection of records.

50 Years of Innovation in Plastic Surgery

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Background

Innovation has moulded the current landscape of plastic surgery, yet documentation of this process only exists scattered throughout the literature as individual articles. Attempts made to profile innovation in plastic surgery have been narrative, therefore qualitative and inherently biased. Through the implementation of a novel innovation metric, this work aims to identify and characterise the most prevalent innovations in plastic surgery over the last 50 years.

Methods

Patents and publications related to plastic surgery (1960 to 2010) were retrieved from the European Patent Office and Medline databases, respectively. The most active patent codes were identified and grouped into technology areas, and subsequently plotted graphically against publication data. Expert-derived technologies outside of the top performing patents areas were additionally explored.

Results

Between 1960 and 2010, 4651 patents and 43,118 publications related to plastic surgery were identified. The most active patent codes were grouped under prostheses, implants, instruments, non-invasive techniques, and tissue engineering. Of these areas and other expert-derived technologies, those currently undergoing growth include surgical instruments, implants, non-invasive practices, transplant and breast surgery. Innovations related to microsurgery, liposuction, tissue engineering, lasers and prostheses have all plateaued.

Conclusions

The application of a novel metric for evaluating innovation outlines the natural history of technologies fundamental to the evolution of plastic surgery. This methodology also provides unique insight into the projected landscape of clinical and academic plastic surgery in decades to come.

Squamous cell carcinoma of the nailbed; a large single-centre series of this rare phenomenon

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Introduction

Squamous cell carcinoma involving the nail complex is a rare condition with a widely variable presentation. Surgical treatment aims to achieve clear resection margins of all involved tissues. There is little guidance in the literature regarding optimal margins and treatment is therefore variable. We present a review of the experience in our institution of managing these rare cases.

Methods

A retrospective review of case notes, operative notes, and histological specimens of all nailbed SCC's presenting to our hospital was undertaken. Data gathered included patient demographics, presentation, treatment including operative data, histological data, length of postoperative follow up, recurrence rates and functional outcomes.

Results

There were 28 cases of nailbed SCC's treated at our hospital over a 12 year period from January 2003 to May 2015. There were 19 males and 9 female. The presentation was highly variable but many had a long history. The tumour infiltrated bone in 5 cases. The majority (18) were managed with amputation at or more proximal to the DIP joint level. Patients were followed for an average of 27 months. There was just one recurrence at 6 years post curettage and cautery. Many patients who underwent amputations had residual functional problems whereas the best functional outcomes were achieved with wide local resection and reconstruction with a dorsal adipofascial (Tremolada) flap (4 cases).

Conclusion

This large series of nailbed SCC's demonstrates low recurrence rates when excision is complete regardless of the surgical procedure. Wide local resection may provide optimal functional and cosmetic outcome without compromising oncological clearance.

Parental Satisfaction and Clinical Outcomes of Neonatal Ear Splinting for Congenital Ear Deformities

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Morrison Hospital

Introduction

Splinting of ears in neonates to correct the congenital auricular deformities has been well described since 1982. Despite it being a non-invasive technique and having a potential to prevent a need for a correctional surgery, its up-take across the UK has been poor. This study evaluates the outcomes of neonatal ear splinting for congenital ear deformities.

Design and Methods

The retrospective study of patients undergoing neonatal ear splinting from 2009- 2015 was conducted at the Welsh Centre for Burns and Plastic Surgery. Data was recorded on the indication of treatment, referral patterns, duration of treatment, complications, follow-up and subjective outcome. An anonymous questionnaire was also used to determine parent satisfaction following the treatment.

Results

A total of 82 (n=123 ears) neonates were treated. At the cessation of treatment 93% were reported as improved/excellent by a clinician. In 82% The correction maintained during follow-up (mean 63 weeks). The mean age at referral was 7.1 weeks. The average time between referral and first appointment was 4.6 weeks. 50.4% (n=62) of the patients presented with a constricted ear. In 66.6% bilateral ears were involved. In majority of the cases the patients were referred by health visitors. In 32.5 (n=40) skin irritation was reported. The mean duration of treatment was 10 weeks. Longer-term parent evaluation (response rate 73%) showed improved/excellent result in 78.89%.

Conclusions

Neonatal ear splinting is relatively inexpensive and has a high rate of success for constricted and prominent ears. By promoting awareness, identifying appropriate patients early and commencing treatment, surgical correction of auricular deformities could possibly be reduced.

Transplant Tolerance for Vascularized Composite Allotransplantation through Induction of Stable Hematopoietic Mixed Chimerism in a Clinically-relevant Large Animal Model

Mr D Leonard, Hunterian Lecturer

Background

Since John Hunter's transplantation of a tooth to a cock's comb, the possibilities of transplantation have advanced to routine transplantation of solid organs between unrelated individuals, and recent cases of hand and face transplantation. Such vascularized composite allografts (VCAs) are limited by acute skin rejection and immunosuppression-related morbidity. Establishment of transplant tolerance of multiple tissues across MHC barriers, without maintenance immunosuppression, may be induced by mixed chimerism, as previously demonstrated in rodent models. In this research, whole-skin VCA tolerance was induced in a large animal model using a clinically-relevant approach, and the mechanisms operational at systemic and tissue-specific levels investigated.

Methods

Single haplotype MHC class I/II-mismatched Massachusetts General Hospital miniature swine donor-recipient combinations were selected. Recipients underwent non-myeloablative conditioning and hematopoietic stem cell transplantation (HCT) with cytokine-mobilized peripheral blood cells to establish mixed chimerism. VCAs were placed concurrent to, or over 100 days post-HCT. Chimerism was monitored by flow cytometry. Cellular and humoral immune responses were assayed *in vitro*. VCA biopsies were graded on the Banff scale. To characterise the cutaneous immune system in tolerance and rejection recipients of VCA/HCT underwent skin biopsies at day 14, 28, 50 and every 50 days until day 250. Epidermis and dermis were separated, and leukocytes isolated from each component were analysed by flow cytometry for lineage (CD4, CD8, MHC Class II, Langerin) and donor/host origin. Controls received VCA alone, or VCA following conditioning but no HCT. Each group contained between 2 and 4 recipients.

Key Results

All HCT recipients developed stable, multi-lineage mixed chimerism with donor-specific unresponsiveness *in vitro*, and demonstrated VCA tolerance (minimum >100 day survival without immunosuppression). Stable chimerism was necessary for VCA tolerance, as control animals uniformly rejected all components of the VCA. *In vitro* studies demonstrated no evidence for systemic cellular regulation or classical anergy in tolerant animals, and transient CD3+ infiltration (including FoxP3+ cells) was observed in early VCAs. By day 14, VCA dermis contained 20-30% host T cells. Epidermis contained 5-15% host Langerhans' cells. Host skin infiltration was also observed, with equilibration of chimerism in VCA, host skin and peripheral blood by day 150. FoxP3+ cells within tolerant VCAs also demonstrated chimerism. In contrast, donor-derived T cells

and Langerhans' cells were rapidly replaced with host counterparts and MHC Class II⁺ inflammatory cells in rejecting VCAs, suggesting that induction of skin-specific tolerance invokes local cellular interactions.

Conclusions

These studies provide proof of principle for whole-skin tolerance of VCAs across an MHC barrier in a large animal model. Establishment of durable mixed chimerism in cutaneous T cells and Langerhans' cells in tolerant, but not rejecting VCAs, suggests that cognate signalling between donor and recipient populations may be necessary for appropriate immune homeostasis and maintenance of skin tolerance.

Further study of these cutaneous immune networks may yield insights important not only for VCA transplantation, but also cutaneous pathology including graft versus host disease and autoimmunity. This paradigm is being further investigated in a non-human primate hand transplant model, potentially the final step prior to translation to clinical trial.

The Impact and Ergonomics of Cervical Spine Injury in Plastic Surgeons

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Introduction and Aims

Anecdotally cervical spine symptoms are common in plastic surgeons. This is thought to be due to the use of operating loupes and their impact on operating posture. We wanted to explore the incidence and impact of cervical symptoms in plastic surgeons as well as the postural impact of wearing loupes.

Material and Methods

A national survey of consultant plastic surgeons was performed using postal questionnaires as well as face-to-face interviews at a previous BAPRAS meeting (2014). This explored the surgeons' demographics as well as their operating preferences.

We then studied consultant plastic surgeons in a simulated surgical environment "operating" both with and without loupes. Their movements were recorded using a motion-capture system and EMG readings were taken of their postural muscles.

Results

We received 329 responses (79% return rate). 107 consultants reported cervical spine pain (32%). 17 patients reported neuralgia, weakness or symptoms of radiculopathy and 15 surgeons had undergone spinal surgery. 19% of all responses reported having time off work due to cervical spine pain.

Increasing age and the total number of hours wearing loupes each week were both significantly linked to positive symptoms ($p < 0.0001$). Gender, handedness, sub-specialty, total hours operating per week and microscope use had no significant relation to symptoms.

The motion capture studies and EMG recordings found that loupe use negative impacts on posture and increases muscular stress for identical tasks.

Conclusions

Plastic surgeons have a very high rate of cervical spine symptoms. A relationship has been proven between these symptoms and loupes usage and our motion capture results clarifies the exact postural causes.

The adjustable breast reduction marker

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Introduction and aims

Various methods of markings the breast have been described, some with marking patterns of fixed dimensions such as the Asplund marker or the commonly used x-ray sheet templates. However, size and shape of breasts varies from patient to patients and marker of variable dimensions should be used for this purpose. This small study involves the use of such a specifically designed marker and investigates the outcomes of the procedure.

Material and Methods

Data was collected prospectively for 30 patients who underwent breast reduction procedure with the inferior pedicle/Wise pattern technique. Various dimensions of the breasts and patient variables were recorded. Variable measurements of the breast markings done with the breast reduction marker were noted. Outcome was assessed specifically for bottoming out, asymmetry and patient satisfaction.

Results

The average amount of breast tissue reduced was 630gm (81 to 1200 gm) with nipple being elevated by a mean of 9cm (4 to 13cm) and placed at a mean distance of 23cm (20 to 26cm) from the supra sternal notch. The height of the vertical limb of the inverted 'T' scar varied from 7 to 10cm (Mean 7.7) and the angle between the limbs varied from 30 to 90° (Mean 70°). Bottoming out was seen in 6 patients (20%) at a mean follow up of 5 months. Asymmetry was present in 84% of patients prior to the procedure and it persisted in 12% of patients, albeit minor in most cases. Areolar symmetry was achieved in all patients. Patient satisfaction was high at a mean of 8.5 out of 10 on VAS.

Conclusion

The variable breast marker helps in marking the breast appropriately for breast reduction procedures, while helping attain symmetry of the areola and avoiding marking it by freehand, which can result in asymmetry.

Stereotactic Navigation Flexible Robot in Craniofacial Surgery: CRANIO-BOT

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Introduction and aims

Craniofacial surgery is currently done through extensive incisions needing bone exposure for osteotomies. Current robotic systems like the Da Vinci are designed for deep cavity surgery and do not have bone cutting capacity. An invention is described that gains access through the buccal mucosa and has the ability to cut bone safely while protecting overlying tissues. The aim of this study is to demonstrate the proof of concept and create a rapid prototype.

Materials and methods

A pre-operative CT scan with 3 dimensional reconstruction is obtained displaying the craniofacial deformity. The surgeon plans the osteotomies on the CAD/CAM model. The entire trajectory is mapped, analyzed by the software and stored as a sequence of steps. The proposed Cranio-bot, consists of five links with two passive joints, two active joints, a localization sensor, and can be controlled by a joystick. The links and the joints work conjunctively to help the surgeon advance the robot in the pre-planned path by providing the surgeon flexibility by rotating about the robot's x axis, z axis, and advancing linearly. The head of the Cranio-bot would contain a bone drill, two retractors to protect duramater on one side and peri-orbita on the other side, an irrigation port and suction to collect bone dust. The surgeon would have control over the retractors, irrigator and the suction through the joystick during the process of bone cutting. The sensor on the tool-head would allow the surgeon to stereotactically navigate the robot by looking at the computer interface.

Results and conclusion

A US "patent pending" status has been granted. Proof of concept details and rapid prototype will be demonstrated, laying the foundation for skull model and cadaver studies.

Trends in types of oncoplastic reconstruction procedures performed in England: a comparison of immediate and elayed breast reconstruction

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In recent years, access to oncoplastic breast reconstruction has improved. However little is known about the trend in type of reconstruction technique. Knowing this information would support service planning, and help ensure the delivery of an equitable service across the country. We aimed to evaluate the trends in type of reconstruction procedure performed in the English NHS.

Women with breast cancer who underwent initial mastectomy between 2007 and 2013 were identified using the national Hospital Episode Statistics (HES) database. Women were grouped into categories based on reconstruction procedure: implant, pedicled flap with or without Implant, and free flap. The trends over time in the proportions of each procedure were examined for both immediate and delayed reconstruction.

Between 2007 and 2013, 25,953 women underwent immediate reconstruction and 7,750 delayed reconstruction. Implant reconstruction was most common in the immediate setting, rising from 29% in 2007

to 45% in 2013. Immediate free flap reconstructions steadily increased from 17% to 21%, whilst pedicled flaps dropped from 48% to 20%. In those women with delayed reconstruction, free flap reconstructions were the most common, rising from 22% in 2007 to 44% in 2013.

There has been a steep increase in immediate implant reconstructions in England, which may be related to the greater use of ADM. Considering autologous PROM outcomes have been proven better, and that free flaps are regarded as the gold standard amongst surgeons, the current practice we report is of concern. The differences between the types of reconstruction used for immediate and delayed reconstructions raise questions about funding and whether waiting list pressures influence patient pathways.

Scar revision surgery: The patient's perspective

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Royal Free London NHS Foundation Trust

Introduction

Insufficient satisfaction outcome literature exists to assist consultations for scar revision surgery; such outcomes should reflect the patient's perspective.

Aim

To prospectively investigate patient satisfaction outcomes after scar revision using specified patient-selection criteria.

Method

Patients (250) were randomly selected for telephone contacting regarding scar revisions undertaken between 2007 and 2011. Patients provided visual analogue scar satisfaction scores pre- and post- surgery. Patient selection criteria were; 'presence' of sufficient scar maturation time prior to revision, technical issues during or wound complications from the initial procedure, and 'absence' of site-specific or patient factors that negatively influence outcomes. Further data collected included; demographics, pathogenesis (elective vs trauma) and underlying issue (functional/symptomatic vs cosmetic). Data were analysed using SPSS (Chi²).

Results

214 scar revisions were performed for 211 (n=68/n=143) contacted patients (minimum 2 years follow-up). Satisfaction outcomes were '2% worse, 16% no change and 82% better'; a distribution maintained between body sites and despite whether surgery was for functional/symptomatic vs. cosmetic reasons. Patients who sustained traumatic scars (91.80%) reported better outcomes than for scars sustained by elective procedures (77.78%) (P=0.016). Females (85.52%) reported better outcomes than males (75.36%) (P<0.05).

Conclusion

Good scar revision outcomes are achievable with careful patient selection; these evidence-based patient outcome data are useful for referring general practitioners and patient-surgeon consultations when planning surgery.

ECGR: External circumferential glove reduction of phalangeal hand fractures, a prospective series

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A prospective case series (n=33) is presented for an external circumferential glove reduction (ECGR) technique that has successfully facilitated accurate and efficient closed reduction and percutaneous K-wire fixation of phalangeal hand fractures with longitudinal/oblique/'pilon-type' components to their fracture pattern.

Total active motion (TAM) calculations indicated 'good' results ($87.34 \pm 1.94\%$; mean \pm SEM; n=27) in patients who completed hand therapy follow-up (3.89 ± 0.31 months). Telephone contacting indicated 100% return to normal function and work. ECGR may be so accurately positioned that even with smaller distal phalangeal fractures, or 'pilon-type' fractures requiring distraction frame application, sufficient space remains for unencumbered K-wire placement, while fracture reduction is maintained. ECGR also obviates the potential requirement for bone reduction forceps, or other techniques that could cause local tissue trauma or are not appropriate for closed reduction and fixation. Furthermore, one can safely proceed with a free hand, used primarily for positioning rather than maintaining reduction, hence increasing assistant-free fixation efficiency.

Surgical Management of Upper and Lower Limb Vascular malformations

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Objective

Vascular malformations (VMs) are a heterogeneous group of developmental anomalies. The Birmingham Peripheral Vascular Anomalies Service is a supra-regional multidisciplinary team that manages non-head and neck VMs in adults. The aim was to review the outcome of surgery in patients with VMs, surgical approaches and complication rates.

Methods

The notes were reviewed of all patients who underwent surgery for peripheral VMs between 2009 and 2014.

Results

Twenty six patients underwent surgery – 20 upper limb and 6 lower limb. Twelve patients had low flow venous malformations; 16 patients had high flow arteriovenous malformations. Indications for surgery included: increased swelling (n=16), pain (n=14); reduced function (n=3), ulceration (n=3) and cosmesis (n=2).

Five patients with high flow arteriovenous malformations underwent preoperative liquid embolization with Onyx. All VMs were excised by identification of tissue planes while protecting neurovascular structures, with

the incorporation of pre-existing scars where appropriate. Twenty patients underwent marginal surgical excision, 6 underwent debulking procedures.

Outcomes were recorded as improved in 24 patients and unchanged in 2 patients. There were 3 cases of skin necrosis. There were no cases of symptomatic persistent malformation.

Conclusions

Surgical resection of vascular malformations can be achieved in appropriately selected patients, with low recurrence and low complication rates. It is not always possible to perform complete excision; however, in complex or diffuse malformations, carefully planned debulking procedures can usefully reduce patient symptoms. Preoperative interventional radiology is useful in selected cases.

Management of Merkel cell carcinoma - what should we be doing?

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Introduction and Aims

Merkel cell carcinoma (MCC) is a rare, aggressive neuroendocrine tumour of the skin of older age. Guidelines for managing this tumour were published last year in a peer review journal which recommended staging, margins of excision, indications for adjuvant therapy and likely outcomes in terms of mortality depending on stage. Our aim was to audit the process and outcome of the MCC cases seen at our institution.

Materials and Methods

A 9-year retrospective review was undertaken of patients identified through the histopathology database. Case notes were examined for patient demographics, differential diagnosis at presentation, disease characteristics, management and outcome.

Key results with supporting statistical analysis

Twenty patients with complete records were included of which 12 were male and 8 were female, with mean age 76 years at presentation. Mean duration of lesion was 5.8 months. The primary site was head and neck in 9 (45%). The most frequent differential diagnosis was BCC followed by SCC and sarcoma. Only one had MCC in the differential. Following diagnosis only one had sentinel node biopsy but 12 had radiotherapy to the primary site. LN disease was palpable at presentation in 3 patients. One year survival is 80% and three year survival is 57%.

Conclusions

Our series had a low rate of sentinel node biopsy but high rate of radiotherapy to the primary site. Our survival at 3 years of 57% is comparable with other series. MCC is rarely diagnosed clinically but given its high mortality rate, this tumour should be included in the differential of any rapidly growing or recently appearing non-pigmented skin tumour.

Modified Glasgow Prognostic score in patients undergoing surgery for soft tissue and bone sarcoma

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Glasgow

Background

The prognostic significance of markers of the systemic inflammatory response in patients with sarcomas remains unclear. The aim of this study was to compare the prognostic value of markers of the systemic inflammatory response in patients undergoing surgery for primary soft tissue and bone sarcoma.

Method

Patients who underwent resection of primary soft tissue/ bone sarcoma between 2008 and 2012 and had pre-operative measurements of the systemic inflammatory response (C-reactive protein and albumin (mGPS)) were included in the study (n=111).

Results

The majority of patients were \leq 50 years old (84%), were female (63%), had soft tissue sarcoma (62%), had tumours >10 cm (52%) and of high grade (85%). The median follow up of survivors was 60 months (range 46-80) and 24 (21%) developed local recurrence, 35 (31%) developed distant metastases and 30 (30%) died of their cancer. On univariate analysis, tumour size ($P<0.001$), tumour grade ($P<0.001$), C-reactive protein ($P<0.001$), albumin ($P<0.001$) and mGPS ($P<0.001$) were significantly associated with distant recurrence free survival. On a multivariate analysis, only tumour size (HR 2.85, 95%CI 1.10-7.39, $P<0.05$) and the mGPS (HR 2.03, 95%CI 1.31-3.16, $P<0.01$) were independently associated with cancer specific survival.

Conclusion

The systemic inflammatory response, as evidenced by the mGPS, was an important independent predictor of recurrence free survival and cancer-specific survival in patients undergoing surgery for bone and soft tissue sarcoma

The Use of Balloon Videofluoroscopy in Assessing and Determining the Treatment of Velopharyngeal Incompetence.

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Lancashire Teaching Hospitals

Introduction

The treatment of velopharyngeal incompetence (VPI) is based on perceptual speech sampling and nasendoscopic and videofluoroscopic examination of the velopharyngeal mechanism.

Balloon videofluoroscopy (BV) was introduced to reproduce the obstructive effect of surgery and demonstrate its benefit or otherwise on speech.

The usefulness of this technique was assessed in a group of patients presenting with VPI in terms of speech outcome.

Methods

Between 1993 and 2008, 133 patients were assessed for VPI. Eighty-two patients also underwent BV alongside standard tests.

Pre and post treatment (surgery/speech therapy) speech assessment was obtained. Forty patients with complete data were analysed in this retrospective study. The relation between the result of BV and the surgical outcome in terms of speech was considered.

Results

Thirty (75%) patients demonstrated improved resonance and clarity of speech with BV (group A) and 10 (25%) showed no improvement (group B).

Twenty-eight patients in group A went on to have surgery. Of these, 26 had improved speech and 2 did not. Two patients in group A did not have surgery and of these 1 had improved speech and 1 did not.

Seven patients in group B had speech therapy only and all these patients had improved speech. Three patients in group B went on to have surgery and of these 1 had improved speech and 2 did not.

Overall, 35 of the 40 patients (87.5%) followed the indication of BV and 5 (12.5%) did not. Thirty three of the 35 patients (94.3%) went on to have speech improvement irrespective of surgery or speech therapy only (95% CI = 80.8% TO 99.3%).

Conclusion

Balloon videofluoroscopy may help in determining the potential benefit or otherwise of surgery and guide decision making in patients with VPI

'Liquid biopsy' in melanoma – circulating tumour DNA as a biomarker of disease

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Addenbrooke's Hospital

Background and Aims

Recent advances in therapies targeting melanoma have included small molecule inhibitors of BRAF and MEK1/2 and antibodies targeting immune checkpoints (eg. CTLA4, PD1/PDL1). For these targeted agents, drug resistance is a recurrent problem, limiting survival benefit. Alongside therapeutics, non-invasive methods to monitor treatment response are urgently needed. Circulating tumour DNA (ctDNA) is an emerging novel biomarker in cancer research. Cell free nucleic acids circulating within the blood stream originate from the tumour and can be sequenced to show the genetic fingerprint of the disease.

Methods

Fresh tumour, blood and urine samples are collected from AJCC Stage III or IV melanoma patients enrolled into each of 4 cohorts: (1) patients with unresectable disease receiving BRAF targeted therapy, (2) patients with resected melanoma at high risk of recurrence, (3) newly diagnosed patients undergoing surgery for primary or metastatic disease, (4) patients with unresectable disease commencing other melanoma directed treatments. Through a collaboration established with the Sanger Institute, next generation sequencing technologies are being used to exome sequence melanoma tumour samples. Simultaneously ctDNA extracted from the plasma at monthly time-points is quantified using a combination of digital PCR and targeted sequencing approaches.

Results

To date 72 patients have been recruited to this multi-centre study. Plasma DNA has been extracted from 22 patients. Total cell free DNA shows a dynamic variation over time, in response to targeted treatment and reflects burden of disease.

Conclusion

ctDNA offers the potential as a non-invasive "liquid biopsy" to monitor mutations and progression of disease.

Therapeutic Antibiotics for Hand Injuries: a systematic review and meta-analysis

Mr G Murphy, Mr M Gardiner, Mr G Glass, Ms I Kreis, Professor A Jain, Mr S Hettiaratchy
RSTN

Objective

To assess the evidence regarding routine antibiotic use to reduce the rate of wound infection after clean traumatic hand wounds.

Design

Systematic review and meta-analysis of treatment effect studies.

Data sources

Pubmed, Embase, Medline, Cochrane central register of controlled trials and Cochrane database of systematic reviews were searched, supplemented by hand-searching all relevant reviews. Searches were not limited by date, language or publication status.

Study selection

Studies were included if they compared the rate of wound infection in patients given an antibiotic versus no antibiotic or placebo at first presentation to an emergency department, in the context of a clean hand wound requiring surgical treatment. Open fractures, animal models and bite wounds were excluded.

Study Appraisal and Data Synthesis

The screening of titles, abstracts, full texts, and subsequent data extraction, were conducted independently by two reviewers. Disagreements were resolved through discussion or arbitration. If appropriate, meta-analysis was conducted using the Mantel-Haenszel methods.

Results

Thirteen studies, involving 2578 patients, were included. There was no significant difference in infection rate between the antibiotic and placebo/no antibiotic groups (RR 0.89 [95% CI 0.65, 1.23], $p=0.49$).

Conclusion

The results do not support the routine use of antibiotics at first presentation to reduce the infection rate in clean hand wounds.

OxPlastics.org – an innovative approach to Plastic Surgery referrals

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Oxford University Hospital

Introduction and Aims

The Hospital at Night programme has redefined out of hours care in the NHS. One major impact has been on junior doctors, where pan-specialty cross-cover has become the norm, particularly among surgical specialties. Many of these doctors have never worked in one or more of the specialties that they are on call for, leading to inappropriate admissions and emergency clinic referrals. The impact on patients is clear, with many subjected to long waits or even started on inappropriate care pathways.

The Department of Plastic and Reconstructive Surgery at the OUH NHS Trust has designed and implemented an intuitive mobile friendly solution to this challenge in the form of a mobile app and website which guides trainees through the initial management of common out-of-hours patient presentations in plastic surgery. In this study we aimed to assess whether the use of this app streamlined the ability of trainees to deal with referrals.

Methods

All trainees covering plastic surgery out-of hours between August 2014 and July 2015 received an anonymised survey questioning their use and opinion of Oxplastics.org.

Key results

Of the 15 responses, 7 trainees had never worked in a plastic surgery department, and a further 3 had only working in one for 6 months. Ten trainees used the app at least a few times a week, with 4 using it daily. Twelve found it easy to use and 8 found it improved their workload.

Conclusion

Requiring doctors to cover specialties outside of their experience can lead to poor service delivery,

inappropriate patient management and low morale. This low-cost system improved the working environment for our out-of-hours first line doctors, and informed their decision-making to be aligned with departmental standards.

Using cutting edge technology to improve Aesthetic Plastic Surgery Training

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Oxford University Hospital

Training recently has become a concern to trainees and consultants alike. The European Working Time Directives, service provision, increased patient demands, NHS restrictions have all contributed to this. One area of particular concern, especially with the advent of the credentialing proposal from the Cosmetic Surgery Interspecialty Committee is Aesthetic training.

PLASTA, the trainee committee, has taken a leadership role in solving this issue. PLASTA has developed an online meeting portal where the consultants and trainees can come together. The consultants and trainees register on the portal. Their credentials are rigorously verified by the portal administrator.

Then the consultants can post their surgeries with the location. They also can name trainees as their favourites. The trainees would receive an automated email informing them that a new procedure has been posted. They can apply to assist on these surgeries. Once confirmed the trainees can attend the surgery they have opted for.

The portal has a GPS map feature which will enable the users to check the distance they have to travel and the time taken using google maps. This portal also has a provision for generating reports in terms of procedures and attendances.

We believe this platform is the first of its kind used for training doctors in and out of the NHS. There is huge potential for it to be translated to other specialties and other areas of training concerns. Various subspecialties may customise this for their own unique requirements. This can also be an invaluable tool for medical students interested in attending certain operations and clinics once this system is adopted by teaching hospitals, medical schools and all consultants interested in training and mentorship.

The mini-temporalis flap – useful adjunct in facial reanimation surgery

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Introduction

Facial nerve paralysis can carry great physical and physiological morbidity for those patients who develop a

permanent deficit. Techniques for improving facial asymmetry following facial nerve paralysis are varied both in terms of functional improvement and levels of risk associated with the procedure. The mini-temporalis flap has its benefits in reanimating the upper lip in that it does not carry the same morbidity as a free flap procedure.

Method

This retrospective case note review looked at patients treated by the senior author over a 4 year period (2010-2014) who underwent a mini temporalis transfer procedure. Data collected included previous procedures, operative time, length of hospital stay and any complications. Independent physicians then analysed the pre and post surgery standardised videos according to Sunnybrook and Terzis's scales.

Results

24 patients were identified, fifteen women and nine men with a mean age of 60.6 (range 35-94). Fourteen patients had had some form of surgery to correct the brow and eyelids at the same operation with the mini-temporalis transfer. Mean operative time was 165 minutes (range 99- 210 minutes). Average length of hospital stay was 3.9 days. The complication rate was 8.3% (one haematoma, and one infection requiring surgical intervention). The pre and post surgical evaluation revealed an overall improvement in both scales.

Conclusion

The mini-temporalis is a safe and relatively quick one-stage procedure that has demonstrable improvement in upper lip symmetry. It should be considered in patients who cannot tolerate a multi-staged procedure or those who need augmentation of existing function.

Pilot of an online burns referral system

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University Hospital of South Manchester NHS Foundation Trust

Introduction

An online referral system has been produced on behalf of NHS England and the burn care Clinical Reference Group. It is being piloted in Greater Manchester with the intention of being rolled out nationally. Referrals are submitted online by the referrer using an NHS Net web link, the only requirement being the need to supply an NHS e-mail. Photographs and x-rays can be attached to referrals.

Material and Methods

The online referral system was developed with MDSAS who have implemented an online referral system for spinal cord injury that has been adopted nationally by SCI centres. The burns referral system is being piloted in the Manchester region to replace faxed referrals.

Key Results

The benefits of the new referral system include no requirement for pre-registration of the referrer, it avoids losing faxed referrals thus improving patient safety, confidentiality and security of information. There is

improved referral information provided which is clear and typed and imaging sent with the referral will facilitate decision making particularly the need to transfer out of area. Login to the system can occur from any NHS computer and an auditable trail of the referral process is retained.

Conclusion

An online system for the referral of burns patients is being piloted. The system allows electronic referrals with clinical images to be sent by the referrer without requiring registration of the referrer. If implemented nationally this system will, in addition to benefits above, provide information to review burns service referrals to assist in the planning and ongoing management of burns services. The technique used here is also applicable to other specialties where the review of imaging would be of benefit during the referral process.

Evaluation of the effects of electronic cigarette smoking on cutaneous blood flow

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Introduction and Aims

Electronic cigarettes (e cigarettes) are subject to very little regulation and their effect on surgical outcomes is largely unknown. Smoking traditional cigarettes is associated with poor surgical wound healing and increased risk of wound complications. Nicotine is a vasoactive ingredient common to both traditional and e cigarettes. The aim of the study was to evaluate the effects of smoking e cigarettes on the cutaneous circulation using thermal imaging technology.

Material and Methods

A prospective pilot study was carried out on five participants in a controlled environment. Disposable e cigarettes of 45mg strength were used. An acclimatisation period, a 5 minute smoking interval and a subsequent recovery period were recorded using thermal imaging technology, focusing on the dorsum of the hand.

'FLIR ResearchIR' software was used to analyse the thermal imaging sequences.

Key results

All participants demonstrated a significant reduction in temperature globally in the hand and all fingers following the initiation of smoking, with recovery after cessation. The mean temperature reduction was 2.1 degrees Celsius (6.4%) in each finger (range 1.7 – 2.5°). The mean time to recovery to baseline was 12 minutes.

Conclusion

The results clearly demonstrate a significant reduction in temperature following e cigarette smoking. This is depicted by a change in colour on thermal imaging, representing a reduction in the emission of infrared radiation and a postulated reduction in cutaneous blood flow.

This is likely to have significant implications on wound healing and plastic surgery.

Based on these findings we recommended absence of e cigarette in the perioperative period.

Risk reducing mastectomy: A rational MDT approach

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St. Andrew's Centre for Burns & Plastic Surgery, Broomfield Hospital

Introduction and Aims

Prophylactic mastectomy (PM) has become increasingly common and its practice varies worldwide often with little or no evidence of benefit. In patients with sporadic unilateral breast cancer, contralateral PM offers questionable survival advantage in most cases. We set up a multidisciplinary team (MDT) of breast surgeons, geneticists, plastic surgeons, psychologists and specialist nurses within our region to improve interaction and facilitate shared decision-making. The aim of this study was investigate the effect of a regional MDT on rationalising PM decision-making.

Methods

Over the three year period, 2011 to 2014, the MDT discussed 151 patients requesting PM. A retrospective review of patient case notes determined whether their requests were accepted or declined and factors justifying the decisions were observed.

Results

PM requests were supported in just over half the cases (53%) and declined for a third (33%). The most common reason for not offering contralateral risk reducing surgery was low risk of developing contralateral breast cancer versus relatively high risk of systemic relapse from the primary disease (46%). A fifth of patients had changed their minds about PM (20%) with a further 7% failing to engage with the MDT process.

Conclusion

Our MDT follows NICE guidance and facilitated cross-specialty interrogation of requests for PM. It reduced the number unnecessary operations and helped justify decision-making for those patients who would derive maximum benefit. Following mastectomies, the patients are primarily concerned about cosmesis and hence the MDT should be plastic surgery led. This model could be replicated within any region seeing patients requesting PM.

Maximising venous drainage in the paramedian forehead flap by utilizing the superficial venous system

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Introduction

The gold standard for reconstruction of the nasal tip and alae is the paramedian forehead flap. Venous congestion can occur due to inadequate venous outflow and may compromise flap survival. It is possible to identify superficial veins in the subcutaneous fat adjacent to the flap, and include them in the flap to aid venous drainage. We investigated the incidence and branching pattern of these veins.

Method

Paramedian forehead flaps were marked on 11 fresh frozen cadaveric heads. Subcutaneous fat adjacent to the flap was dissected. All superficial veins emanating from the flap and running within 10mm of the flap margin, were identified and pattern recorded.

Results

A medial superficial vein was present within 10mm of the flap margin in all cases, draining to the ipsilateral supratrochlear region in 10 of 11 cases. One drained to the contralateral region. A lateral superficial vein was present less frequently (8 of 11 cases), all drained to the ipsilateral supratrochlear region.

Mean distance of the superficial vein from the peripheral flap margin was 7.3mm. The point of emanation from the flap margin ranged 14mm to 72mm superior to radix (mean 37mm). The superficial veins had multiple connecting branches to the flap (mean 2.57 branches).

Conclusion

In a series of 11 cadaveric dissections it was possible, in all cases, to raise a standard paramedian forehead flap and identify a superficial vein within the subcutaneous tissue adjacent to the pedicle that could be included to augment the venous drainage. This was most consistently found medial to the flap pedicle and drained to the ipsilateral supratrochlear region. The close proximity of such superficial veins allows their inclusion, and should reduce the incidence of venous congestion.

Review of quality and quantity of technology based innovation in Plastic Surgery journals

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Introduction

Historically a significant number of new surgical tools and innovations originated in Plastic Surgery. This study aims to assess the quantity and quality of publications focusing on technology based Plastic Surgery Innovation.

Methods

A systematic review of all publications in 9 Plastic Surgery journals published over 12 months. All articles describing a new innovative product, device, implant or materials were included. The quality of the publications were assessed against the IDEAL Framework.

Results

Overall a 3188 publications were assessed out of which 57 met the inclusion and exclusion criteria (1.79%). The highest percentage of technology innovation was found in the Microsurgery (4.85%) and the lowest in the Journal of Hand and Microsurgery (0%) and Annals of Plastic Surgery (0.62%). Over half (50.8%) of the papers were based on clinical data and 28.1% were animal studies. A significant proportion 54.4% of papers evaluate products currently available on the market. Based on Ideal Framework classification 49.1% of publications were a novel idea (Stage 1). A further 14.0% were in development (Stage 2a), 7.02% were being explored for potential application (Stage 2b). A total of 19.3% of publications showed innovations in the assessment stage (Stage 3) and a further 10.5% had progressed to long term evaluation (Stage 4).

Conclusions

Overall we found a low rate of technology based innovation being published in Plastic Surgery journals. Majority of the published articles showed a low compliance with Ideal Framework Recommendations. Further work needs to be done to explore the barriers to technology innovation in Plastic surgery and compare our innovation outputs with other surgical specialities.

Development of upper limb and hand surgery training in challenging and austere environments

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Introduction

Upper limb and hand surgery is quality of life surgery not usually life or limb saving surgery. Major upper limb injuries have profound effects on the socio-economic life of an individual, family and society as well as individual's functional abilities. However, it is also well known that seemingly small injuries of the hand can significantly interfere with hand and limb function and with simple activities of daily living.

Early appropriate management of a hand injury is of the utmost importance.

State of the art surgery and specialisation is a challenge in any country and the balance between service provision and training, in today's economies, is part of that challenge for all concerned.

Materials

Development of hand surgery as a speciality will be reviewed from published literature with particular attention to the development of hand surgery training programmes. The need also for the development of other essential services such as dedicated hand physiotherapy is reviewed

The establishment of an upper limb and hand surgery training including microsurgery in a poor resourced area will be presented with particular reference to Gaza Strip where a French based programme has been in place for over 5 years. An up-to-date assessment of the programme will be given, highlighting issues for triaging patient care and the balancing of training necessities.

Cleft Width is a Positive Predictor of Nocturnal Desaturation in Syndromic Cleft Palate Patients

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Introduction

Sleep disordered breathing (SDB) and its associated sequelae of neuro-developmental delay and growth retardation are increasingly recognised as issues in cleft patients. We have previously shown that use of standardised pre-operative sleep data can obfuscate the need for emergent/emergency airway adjunct insertion following cleft lip+/-palate repair. This study's aim was to investigate potential relationship between sleep characteristics and cleft palate dimensions in an effort to guide the use of airway support peri-operatively.

Methods

Palatal measurements were made in 33 consecutive patients attending a single centre. 18 (54%) had an isolated cleft palate; 8 (25%) a unilateral complete cleft palate, and 7 (21%) a bilateral complete cleft palate. Syndromic cleft palate occurred in 7 patients (21%). Measurements of palatal cleft width (HSJ), inter-tuberosity distance (ITD) and cleft palate index (CPI = HSJ /ITD) were recorded pre-operatively. Desaturation Index (DI) is used as a measure of SDB.

Results

All cleft patients demonstrated a degree of SDB. Syndromic patients have a statistically significantly higher DI compared to non-syndromic patients (median 31.5 Vs 9.15: $p=0.003$). A weak positive association was seen between all palatal measurements and DI. A strong and statistically significant positive association was seen between ITD and DI in syndromic patients $p=0.041$.

Conclusion

These data demonstrate that cleft measurements correlate with the severity of SDB particularly in the syndromic cohort. In settings where sleep data is not available, palatal dimensions measurements may identify patients at risk of post-operative airway compromise allowing for prophylactic airway adjunct.

Assessment of the current management of open fractures of the lower limb within the UK trauma network: analysis of a multi-centre audit of compliance with BOAST 4 national guidelines

Mr B Rymer, Miss E Dimovska, Miss C Bishop, Mr D T S Chou, Mr J Bedford, Mr R Choa, Mr B Davis, Mr S Wilson, Mr S Huq

Royal Stoke University Hospital

Introduction and Aims

Open fractures of the lower limb represent a complex and varied array of injuries. BAPRAS and BOA have produced detailed standards on how to manage these patients. We aimed to assess concordance with these standards across a portion of the UK trauma network.

Materials and Methods

Patients admitted to University Hospital of South Manchester (MTC), Norfolk and Norwich University Hospital (TU) and Royal Stoke University Hospital (MTC) with open lower limb fractures between 2009 and 2014 were included. Data was gathered from notes and endpoints based on the BOAST 4 document.

Key Results

In total, 132 patients were identified across the 3 sites, with 129 having their initial debridement and fixation within 24 hours (97.7%). Fifty-nine patients had a documented out-of-hours initial surgery. Of these, 12 (20.3%) had an indication for urgent surgery. This pattern was consistent across all three hospitals. Data from two hospitals showed a plastic surgeon was present at 40.2% of initial operations. Of 125 patients receiving definitive soft tissue cover, 47.2% had cover within 72 hours and 72.8% within 7 days. Main reasons for delay were inter-hospital transfer, plastics not present at initial operation and intervening critical illness.

Conclusions

There remains great scope for improving compliance with the national BOAST 4 standards, with out-of-hours operating occurring unnecessarily and time targets being missed. The development of a true orthoplastic approach is required to improve the management of this complex set of injuries. Strategies for achieving this will be discussed.

The Yorkshire microsurgery forcep

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Introduction

A prototype microsurgical forcep was trailed to determine if it reduced tremor in microsurgical practice.

Methods

A validated microsurgical simulator was used to compare a standard microsurgical needle holder and the prototype. A pilot study of three participants performed the simulated task for six minutes with each instrument, with a one minute baseline measurement. Surface electromyography (EMG), digital force (N) and acceleration (tremor) were recorded for the hand and wrist.

Key Results

Consistently less EMG activity was observed in the extensor digitorum, wrist flexors and thenar eminence using the prototype, but this did not reach significance. The prototype required consistently less force (N) across the trials but this did not reach significance. There was significantly less acceleration ($p=0.037$) for the prototype in two subjects and no difference in the third.

Conclusions

Our microsurgical forcep has shown potential to reduce muscle use and tremor in microsurgery. In an era of improved technologies and a demand for ergonomic instruments we believe this forcep will have a use. A larger study on novice and expert microsurgeons is currently in process.

An Audit of the Peri-Operative Management & Experience of Cleft Lip & Palate Patients: A prospective re-audit following a change from oral codeine to oral morphine

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Spires Cleft Unit

Introduction and Aims

The Royal College of Anaesthetists published 'Raising the Standard: a compendium of audit recipes in 2012', where standards of pain assessment/recording of effective pain control are discussed. We audited these standards in infants undergoing cleft lip/palate surgery following a change from codeine to morphine (oral).

Materials and Methods

We prospectively re-audited between June-December 2014 the preoperative, perioperative and postoperative records of infants undergoing cleft lip/palate surgery at Oxford Spires cleft unit. All infants had regular paracetamol, ibuprofen and when required oral morphine prescribed. We recorded the FLACC pain scores, numbers of administrations of analgesics and parental satisfaction with analgesia whilst in hospital/home and their overall satisfaction.

Results

24 infants aged 3-12 months were audited. 386 FLACC scores were recorded, of which 301 (93%) had a FLACC score 0, 43 (11%) scored 1, 8 (2%) scored 2 and 5 (1%) scored 3. 85%/72% of parents recorded the pain control as 'excellent/good' in hospital/home respectively. Parents recorded as pain control as 'poor' 10% and 6% whilst on ward/home respectively.

Conclusions

Comparison is made with a previous audit cycle in 2012. Improvements in both recovery and ward FLACC score documentation and as well as improved parent satisfaction scores with analgesia whilst in hospital. Overall parental experience reduced from 89% in 2012 to 72% in 2014.

TWIST1 Silencing Enhances in-vitro and in-vivo Osteogenic Differentiation of Human Adipose Derived Stem Cells by Triggering Activation of BMP-ERK/FGF Signaling and TAZ Upregulation

Mr K Senarath-Yapa, Dr N Quarto, Dr A Renda, Dr M Longaker

Kings College London, Stanford University, Northwestern Deanery Manchester

Human adipose-derived stem cells (hASCs) are an ideal source of cells for regenerative medicine. Optimising their osteogenic capacity by modulation of signaling pathways is a key translational objective.

TWIST1, associated with Saethre-Chotzen syndrome, is a transcription factor that controls lineage commitment and differentiation. We show that TWIST1 shRNA silencing increases the osteogenic potential of hASCs in vitro and their regenerative ability in vivo in a calvarial defect model. We demonstrate that the increased osteogenic capacity with TWIST1 knockdown is mediated through activation of BMP and FGF signaling and upregulation of TAZ, a transcriptional modulator of MSC differentiation.

Methods

Human ASCs were obtained from lipoaspirate. Knockdown of TWIST1 and TAZ in hASCs was achieved with shRNA lentiviral particles. Osteogenic differentiation assays were performed on shTWIST1 hASCs, shTAZ hASCs and control hASCs and qRT PCR performed for osteogenic markers. The different cell groups were seeded on (PLGA) scaffolds and placed in 4mm critical calvarial defects and healing assessed using mCT and histology.

Results

Downregulation of TWIST1 increased in-vitro osteogenic potential and expression of osteogenic markers; Downregulation of TWIST1 enhanced BMP and ERK/FGF signaling and upregulation of TAZ. Co-silencing of TWIST1 and TAZ abrogated the effect elicited by TWIST1 knockdown alone, identifying TAZ as a key downstream mediator. shTWIST1 hASCs potentiated bone repair in vivo ($P < 0.05$).

Conclusions

TWIST1 knockdown enhances osteogenic differentiation of hASCs through activation of BMP/FGF signaling and upregulation of TAZ. Our study identifies TWIST1 as a key target to facilitate in vivo bone healing.

Small Molecule Inhibition of TGF β Signaling Unlocks the Endogenous Regenerative Potential of the Mammalian Calvarium by Potentiating BMP Signaling and Reducing Apoptosis

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Kings College London, Stanford University, Northwestern Dean

While the promise of effective cellular therapies for skeletal repair is encouraging, these approaches are limited by the risks of tumorigenicity, infection, and contamination. A pharmacological approach would help avoid these risks. We identify TGF β signaling as a candidate for pharmacological modulation in vivo.

Inhibition of TGF β signaling by the small molecule SB431542 potentiates calvarial repair through activation of BMP signaling and reduced apoptosis in osteoblasts (mPOb) and dura mater cells. Studies on human osteoblasts (hPOb) indicate that molecular mechanism(s) triggered by SB431542 are evolutionarily conserved.

Methods

SB431542 was delivered into mouse calvarial defects and healing assessed using mCT and histology. IHC was performed on calvarial sections for pSmad 2, an effector of TGF β signaling and pSmad5 an effector of BMP signaling. In vitro studies were performed on mPOb, dura mater cells, and hPOb derived from pediatric calvarial samples. These include gene expression analysis with qRT and immunoblotting for pSmad2 and pSmad5.

Results

TGF β inhibition using SB431542 potentiates calvarial healing. IHC shows that TGF β inhibition leads to potentiation of BMP signaling. Osteogenic differentiation in mPOb, dural cells and hPOb is enhanced with SB431542 via increased BMP signaling and reduced apoptotic activity. Increased inhibitory Smad6 provides negative feedback against excess BMP in response to TGF β inhibition.

Conclusion

TGF β inhibition promotes calvarial regeneration by potentiation of BMP signaling, and by reducing apoptosis. The conservation of these mechanisms in hPOb suggests that modulation of TGF β signaling may be a viable therapeutic approach for large calvarial defects.

Three Routine Free Flaps Per Day In A Single Operating Theatre – Principles For Improving Surgical Efficiency

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St Andrew's Centre for Burns & Plastic Surgery, Broomfield

Background

Breast reconstruction is a multi-stage process, involving many individual procedures and many healthcare professionals which take the patient through from diagnosis of breast cancer to the completion of cancer treatment and ultimate breast reconstruction. With an experience of over 3000 autologous breast reconstructions, we have refined both our surgical technique and overall approach to breast reconstruction to improve the efficiency in free flap based breast reconstruction surgery.

Methods

By looking at various steps as a simple component of the whole, we have improved our theatre efficiency to maximize patient throughput and improve our outcomes for breast reconstruction patients. Our approach to the preoperative, intraoperative and postoperative aspects of management are presented.

Results

Since beginning free flap breast reconstruction surgery, we have improved overall efficiency by applying a process mapping approach. In our early experience, we undertook a single patient undergoing breast reconstruction with a free flap per theatre list, moving to two patients having breast reconstruction, and now carry out three free flap based reconstructions in a single theatre per day as a routine. Specific times are demonstrated, with no increased complication rate.

Conclusion

Through clearly defined processes, operative efficiency in autologous breast reconstruction can achieve three free flaps per day in a single theatre.

The Future of Plastic Surgery: say yes to trauma

Mr Andreas Shiatis, Miss Hawys Lloyd-Hughes, Mr Amit Pabari, Mr Shehan Hettiaratchy

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Major re-structuring of emergency care has led to the centralisation of trauma to regional centres. Plastic surgery has seen an increased involvement to include upper and lower limb trauma in addition to craniofacial injury. Current trainees have a varied exposure to trauma and at present there is no dedicated trauma fellowship. Other surgical specialities such as orthopaedics and vascular have pioneered in creating dedicated trauma consultant posts and there is a fair possibility that plastics may follow.

Bearing in mind the demanding responsibility of such posts we circulated a questionnaire to plastic trainees via PLASTA to identify their ideas, concerns and interests for such posts. Seventy-nine trainees across the UK replied.

Although 92% of participants place an important significance to trauma during training, only approximately 50% are exposed to weekly or daily trauma, with the lowest values in craniofacial trauma. Most (80%) argue that all trainees should spend time in a major trauma centre, with 81% keen to apply to a trauma fellowship and 70% even taking time out of training to fulfil this interest. Should trauma and reconstructive surgery

became a subspeciality within plastics, 65% of current trainees would be interested in pursuing this as a long term career.

Microsurgery Training in the UK: Do we need simulation Training?

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With the advances in reconstructive surgery, microsurgical skills have become vital for plastic surgeons. Due to the intricacy of this skill, it is challenging for trainees to acquire adequate practise at work. This has resulted in juniors visiting overseas reconstructive centres for fellowships or even investing a significant sum of money for courses. Other surgical specialities including general surgery and orthopaedics have invested in simulation training for juniors but such facilities are rare in plastics. We conducted a survey via PLASTA to assay the exposure of our trainees to microsurgery across the UK and their views on simulation training.

140 trainees completed the questionnaire. Responders were equally distributed amongst all levels of training. All attended a microsurgery course with approximately 88% spending between £1000-£2000. 96% only assisted in microsurgery prior to attending a course, and although most found that the course improved their confidence, it was insufficient to majorly improve their skills. Only 35% of trainees have access to some sort of microsurgery simulation training but most are of poor quality. 100% of trainees agree that simulation should be made available in every plastics unit across the UK to help achieve required competencies within the national plastic surgery training scheme.

Children requiring resuscitation fluids: is the urinary catheter really needed?

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Background

International guidelines indicate that children with a burn TBSA > 10% require resuscitation fluids and insertion of a catheter to monitor urine output. The insertion of a catheter, however, does not come without complications and can be very stressful for an awake child. For these reasons, in non-severely burned children (<25%TBSA), it would be desirable to avoid using a catheter and to evaluate the effectiveness of the resuscitation by measuring urine output when naturally passed and by monitoring vitals signs.

Methods

A retrospective review of 102 paediatric patients admitted with acute burns between 10-25% TBSA during 2009-2014. Data was extracted from the International Burns Injury Database.

Results

Median age 4.5 years (age range: 2 months-15 years old). F:M = 1.2:1. The mechanism of injury was: scald 71%, flame 20%, flash 7%, electrical 1% and radiation 1%. Data was analysed in 2 groups according to burn TBSA: Group 1: 10-19% and Group 2: 20-25%

In group 1, 18 patients (24%) were catheterised versus 72% in group 2. Region of burn was a statistically significant indication for catheterisation (genitalia/buttock). Complications were UTI (14%), and extreme distress in 3 patients. All the patients received resuscitation fluids according to protocol. No complications in over or under-resuscitation were recorded. No complications were recorded in patients who were not catheterised. In these patients vital signs were stable, but the majority of them received a fluid bolus.

Conclusion

Paediatric burns <25% TBSA can be managed safely without catheterisation. Portable bladder scan may help avoid unnecessary fluid boluses in children holding urine

Oplnform.com – an electronic consent platform that may improve suboptimal consent practice

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Introduction

Consent forms structure the discussion of a procedure's risks and benefits and provide medico-legal evidence of the consent process. We prospectively audited the completion of hand-written consent forms and subsequently re-audited following the introduction of a web-based platform we designed to generate electronic procedure-specific forms – Oplnform.com.

Methods

Between December 2013 and March 2015 hand-written consent forms for breast reconstruction procedures were prospectively audited at two NHS Trusts. The documentation of procedure complications was assessed for legibility and inclusion of appropriate complications. We designed software to generate fully modifiable, procedure-specific forms with pre-populated complications validated by consultant experts. Oplnform.com was used to generate bespoke consent forms and these forms were audited within a breast surgery unit in the same manner.

Results

Forty-nine hand-written consent forms were audited. Overall, 13 forms (26.5%) contained illegible complications. There was significant variability in the number and type of complications documented for a given procedure. Important complications were frequently omitted – 3 out of 11 (27%) consent forms for implant-based reconstruction failed to document the possibility of implant loss. In contrast, for 29 electronically-generated consent forms, the documentation of complications was consistent, legible and comprehensive.

Conclusions

The completion of hand-written consent forms for breast reconstruction procedures was frequently suboptimal because of poor legibility and failure to document important complications. OpInform.com can improve the consent process by addressing both of these failings.

On hot water: implications of a Major Burns disaster in Ghana

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Salisbury NHS Foundation Trust

Introduction

On 3rd June in Accra, Ghana, flood waters carried petrol from a filling station, which ignited, causing mass casualties. We evaluate this major fire disaster with 90 hospital casualties, its outcome and resource use.

Methods

We collected data from patients, injured directly or indirectly, treated at four major hospitals: Korle-Bu Teaching Hospital (KBTH), Police, 37 Military and Ridge Hospitals.

Information was gathered using a standard pro-forma. Adherence to the Parkland resuscitation protocol, time to presentation, site and size of burn injury, presence of inhalation injury, interventions, complications and outcomes were recorded.

Results

There were at least 150 deaths on site. Ninety patients were triaged with 54 during the first 24 hours. Eighty-five had burns and 62 were admitted. Median age was 28 years with 9% TBSA (2.5 - 51%). Most had appropriate fluid resuscitation. Six had inhalational injuries. Seven had surgery. Eighty survived and 5 died in hospital. Nine suffered complications while in hospitals. Nineteen received psychological counselling.

Conclusions

This major incident caused significant loss of life from effects of the fire.

Due to proximity and triage needs, most did not present to the National Reconstructive Plastic Surgery & Burns Centre (NRPSBC) at KBTH. Resource and capacity issues meant that patients experienced delays in transfer. There was no major incident plan to coordinate resources.

Burn services in Ghana struggled to meet the extra demand in capacity. There is a great need for burn care in West Africa, and major incidents such as this highlight the need to invest in infrastructure, training and the establishment of referral networks to optimise delivery of burn care.

A 20-year review of 62 consecutive patients with complete unilateral cleft lip and palate operated on between 1983 and 1993

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Oxford University Hospitals NHS Trust

Aims

To assess the aesthetic, functional and psychological outcomes in a consecutive series of 20 year-old UCLP patients treated by a single surgeon.

Methods

The surgical protocol was: pre-surgical orthopaedics, lip repair at 3 months without vomerine flap, and palate repair at 6 months. All patients were assessed at a minimum age of 20 years using a multidisciplinary approach.

Results

Additional surgical procedures: fistula repair 14.5%, lip revision 33.9%, ABG 98.4%, rhinoplasty 69.4%, speech surgery 11.3%, osteotomy 9.8%.

Dental arch relationship (modified GOSLON): 1-2: 60.7%; 3: 18.0%, 4-5: 21.3%.

Craniofacial form: SNA: 75.4 (\pm 3.9); SNB: 75.9 (\pm 4.4); ANB -0.5 (\pm 2.8).

Speech (CAPS-A): hypernasality absent/borderline 96.8%; nasal emission/turbulence 1.6%; articulation errors 16.1% (anterior in 9.6%).

Hearing: normal 88.5%; mild impairment 8.2%; moderate impairment 3.3%. 30% required grommets.

Panel aesthetic assessment: very poor: nil; poor 3.2%; average 59.7%; good 33.9%; very good 3.2%.

Psychological wellbeing: negative impact 17%; neutral impact 63%; positive impact 20%.

Avoidance of activities due to appearance: 31%.

Conclusion

Outcomes are dependent on team care, a robust protocol and a surgeon exposed to adequate numbers of patients. Long-term follow-up and honest reporting are fundamental. Where comparisons are possible, these findings compare favourably with other reports of late outcomes.

Intracrine and Paracrine Regulation of Biologically Active Vitamin D by Human Dermal Fibroblasts: Implications for Cutaneous Wound Healing

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Plastic Surgery and Burns Research Unit

Keratinocytes are a target and source of vitamin D by converting cholecalciferol to the active metabolite $1\alpha,25$ -dihydroxyvitaminD₃ ($1,25(\text{OH})_2\text{D}_3$) via 25-hydroxylase (CYP2R1) and then 1α -hydroxylase (CYP27B1). 24-

hydroxylase (CYP24A1) regulates local levels by inactivating 1,25(OH)₂D₃. The absence of 1,25(OH)₂D₃ or the receptor (VDR), impairs granulation tissue formation in murine wounds, but little is known about the paracrine and intracrine regulation of vitamin D in human skin following injury.

Using qRT-PCR expression of VDR, CYP2R1, CYP27B1 and CYP24A1 in donor-matched primary cultures of human fibroblasts and keratinocytes was compared. The effect of cholecalciferol or 1,25(OH)₂D₃ on fibroblast migration in a scratch-wound assay and whether this induced changes in mRNA expression was determined. VDR was higher in dermal fibroblasts than keratinocytes in wounded and non-wounded cultures. 1,25(OH)₂D₃ inhibited fibroblast migration as early as 4h and up to 24; cholecalciferol inhibited migration after 24h. 1,25(OH)₂D₃ reduced VDR and CYP2R1 in wounded fibroblasts, while CYP24A1 increased; there was no change in CYP27B1. In contrast, cholecalciferol increased mRNA expression of VDR, CYP2R1, CYP27B1 and CYP24A1 in wounded fibroblasts.

This study demonstrates human dermal fibroblasts express the necessary enzymes for autocrine production of 1,25(OH)₂D₃. Higher VDR expression suggests they may be more responsive than keratinocytes. Changes in the metabolism of vitamin D and VDR levels in the presence of cholecalciferol or 1,25(OH)₂D₃ highlight fine-tuning of vitamin D availability in the dermis after wounding. Delineating the molecular mechanisms may lead to improved therapies for chronic wounds.

Multicenter randomized controlled trial to assess an e-learning on acute burns management

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Introduction

Only 13% of medical schools in the UK provide structured burns teaching due to logistical difficulties. These include: lack of expertise to deliver proper training, lack of time within the course, and differing teaching between academies. The aim of this study is to provide objective evidence supporting the role of e-learning on acute burns management called Basic Burns Management (BBM) to aid medical schools to ensure burns teaching.

Method

A twenty-page website (www.basicburnsmanagement.com) was created, covering topics such as responses to burns, assessment of burns, primary and secondary survey, and referral guidelines. A multicenter randomised controlled trial was conducted between January 2013 and March 2015, comparing the educational benefits between two groups taught by means of the BBM and traditional lecture. Knowledge was assessed by means of a questionnaire before and after the sessions. Satisfaction was also assessed. Scores were compared between the two groups through univariate and bivariate analysis.

Results

Sixty-nine medical students were enrolled: 35 in Group A (BBM e-learning) and 34 in Group B (traditional

lecture). Both demonstrated significant gains in knowledge after intervention ($p < 0.001$), regardless of medical school year. Students undertaking the BBM e-learning had a greater score improvement compared to the traditional lecture (50.0% score improvement in Group A versus 46.5% in Group B) though it was not statistically significant.

Conclusion

BBM is a free tool that provides equivalent learning opportunity to a traditional lecture for medical students. It may be used to incorporate burns teaching within their educational setting, regardless of level of experience

Litigation following carpal tunnel release: how heavy is the burden?

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Introduction

Approximately 53,000 carpal tunnel releases are performed in the UK annually with an overall success rate of 95% and low complication rate of less than 3%. Despite this, litigation following carpal tunnel release has been shown to account for 22% of all claims related to hand and wrist surgery. This study aims to specifically assess the burden of these claims arising within the plastic surgery specialty over the last decade.

Method

A freedom-of-information request was made to the National Health Service Litigation Authority requesting details of all claims made following carpal tunnel release while under the care of plastic surgery from 2004-2014.

Results

Seven claims were made in the ten-year period investigated. One claim relating to intra-operative nerve damage was unsuccessful and two claims relating to nerve damage and inappropriate treatment remain open. Of the remaining four successful claims three were due to nerve damage which in one case sited as improper delegation to junior. The fourth successful claim was due to failure to perform operation which was categorised as an unnecessary intervention. Damages paid varied from £4000 to £175,000 with the total for the four successful claims amounting to £269,000.

Conclusion

The volume of successful litigation claims following carpal tunnel release under the care of plastic surgery is low at only four cases over a decade.

Calf Perforator Flaps – an Ideal Choice for Oral Cavity Reconstruction

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GSTT

Introduction

Calf perforator flaps are emerging as a popular choice for soft tissue defects requiring thin pliable tissue. The medial sural artery (MSAP) flap is the most common source vessel in this region. We set out to demonstrate that calf perforator flaps have ideal properties for oral cavity reconstruction.

Method

There were three parts to the study – an assessment of anatomy, donor tissue suitability and clinical use. Firstly, a cadaveric dissection study (20 lower limbs) was performed to demonstrate perforator reliability and document variations in source vessels. The quality of donor calf envelope was assessed by comparing relative tissue thickness of the calf with the anterolateral thigh in 50 lower limb CT scans. Finally, a prospective clinical study was performed over an 18-month period. Demographic, oncologic and surgical data were collected on sequential calf perforator flaps used in oral cavity reconstruction.

Results

On cadaveric dissection, medial sural artery perforators were found in 19 of 20 limbs (95%). Septocutaneous perforators from the sural artery system were present in 2 limbs (10%). On CT imaging, the mean thickness of the calf envelope was 49.5% of the anterolateral thigh donor site ($p < 0.05$). Fourteen calf perforator flaps (12 MSAP, 1 Sural Artery Perforator, 1 Soleal Artery Perforator) were performed (7 floor of mouth, 6 tongue, 1 buccal mucosa). The mean flap size was 9 x 5cm. All flaps survived. Early complications included one return to theatre (haematoma) and 3 wound infections (1 donor, 2 neck).

Conclusion

Our study suggests that the vascular anatomy of the medial calf is predictable, yielding perforator flaps that reliably provide thin and pliable tissue - ideal for oral cavity reconstruction.

Influencing a career in plastic surgery, evidence-based training and workforce planning predictions

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Royal Free London NHS Foundation Trust

Introduction

Plastic surgery is a competitive career choice despite minimal exposure at medical school. This research quantifies the factors influencing career interest in plastic surgery and speciality appeal. The evidence-based findings contribute to optimising and tailoring undergraduate plastic surgery training and postgraduate selection criteria.

Methods

Medical students from two national plastic surgery undergraduate courses were invited to complete a questionnaire. Questions included past experience and career interest in plastic surgery, sources of exposure and motivational factors. Data were recorded on modified Likert scales, before linear regression analyses.

Results

One hundred and seventy-five students completed the questionnaire (81% response). Duration of medical student exposure to plastic surgery was significantly associated with career interest ($r^2 = 0.157$; $p < 0.0001$). Significance for the trend remained even after removing outlier(s). Influential sources of exposure included: (1) Operating Room (2) Consultant/Attending interaction (3) Trainee interaction. Motivational factors towards a career in plastic surgery were primarily operative satisfaction (91%), improving patients' quality of life (89%) and performing reconstructive surgery (88%). The three most popular sub-specialities were (1) hand and upper limb surgery (28%); (2) cleft lip and palate surgery (26%) and (3) burns surgery (15%).

Conclusion

This study identified influential factors upon decision making towards a career in plastic surgery. Medical student exposure can be tailored to maximise exposure to positively influencing educational content, in order to optimise evidence-based plastic surgery training.

An Analysis of the Most Common Hand Injury Mistakes and their Cost in the Acute Setting

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Introduction and aims

Hand injury errors can cause considerable reduced quality of life and subsequent litigious claims are costly to the NHS. Early diagnosis and management of hand injuries in the Emergency Department (ED) is key to providing optimum care for hand injury patients. The aim of this study was to improve patient safety by providing insight into the most common hand injury errors occurring in the ED.

Materials and Methods

A Freedom of Information request was made to the NHS Litigation Authority (NHS LA) for data on all claims in England related to hand injuries made against EDs from 2004 – 2014. This was supplemented with an in-depth analysis of all successful hand injury error claims against an individual ED between 2004 and 2014.

Key Results

Three hundred and fifteen claims related to hand injury errors were made nationally. Two hundred and eighteen were successful, resulting in a total cost of £6,273,688.22. Failure or delay in diagnosis was the most common successful claim (97), costing a combined total of £2,602,099.93. Six successful claims were brought against the individual ED. Four had been settled at an average cost of £10,750. Two were on-going. Five claims

were due to missed fractures, 1 was due to prescribing error. Causes of errors were multifactorial in most cases and included the use of inappropriate views and failure to correlate imaging with clinical findings.

Conclusion

Hand injury diagnostic error has been the most common cause of successful litigious claims against EDs over the past 10 years. Many junior doctors working in the ED are inexperienced in dealing with hand injuries and require further training in this area. Junior doctor education must emphasise the importance of clinical findings when diagnosing hand injuries.

The Medial Plantar Flap Produces Good Long-Term Outcomes in Foot and Ankle Reconstruction

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Introduction and Aims

The glabrous plantar skin found on the foot and ankle is unique and perfectly adapted to weight bearing, limiting options for like-for-like tissue reconstruction in this region. Soft-tissue reconstruction of foot and ankle defects must be durable and provide sensation to prevent future injury. This study aims to quantify sensation return when a medial plantar flap is used to repair foot and ankle defects.

Material and Methods

Two-point discrimination in millimetres (2PD) was assessed in both flap and normal tissue of the contralateral foot in patients who had received a medial plantar flap over a year previously. The mean 2PD in both flap and normal tissue was calculated and a paired T-test was used to assess for a significant difference between flap and normal tissue.

Results

Eight patients were included. Mean 2PD was 29mm (SD: 11.9) in the contralateral foot and 33mm (SD: 9.97) in the flap. No statistically significant difference in 2PD was found between flap and contralateral foot (two tailed p value: 0.1898). Mean age was 53.2 years (range 15-84). There was no statistically significant correlation between age and 2PD on the flap tissue ($r=0.6$, $p=0.15$) suggesting no worsening of sensation when this flap is utilised in older age groups.

Conclusions

To the best of our knowledge this is the first case series to quantify long-term sensation return in medial plantar flaps used to repair foot and ankle defects. Our results suggest that after a year, sensation in the medial plantar flap can return to near normal. This demonstrates the important role the medial plantar flap plays in soft tissue reconstruction in this region.

Using a smartphone friendly guideline improves clinic efficiency and patient outcomes in an outpatient trauma review service

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Our consultant led trauma service reviews around 80 patients per week in a time constrained clinic environment. Patients are referred to this service from accident and emergency (A&E) based on their assessment against a guideline designed to ensure that only patients requiring specialist input are seen in the clinic.

A review of our service highlighted only 48.9% of referrals adhered to the guidelines provided which resulted in 25 appointment slots (30 minutes each) in a two week period that were used by patients requiring simple advice at first point of contact rather than specialist review. This equates to 12.5 hours of consultant time. Our quality improvement project aimed to improve adherence to our guideline by introducing a smartphone friendly version. Our study of this intervention showed a 26% increase in guideline adherence and an 80% reduction in inappropriate use of clinic slots following its introduction.

We propose that this use of technology has improved efficiency within our service as evidenced by a reduction in inappropriate use of clinic slots. In addition it has improved patient outcomes by reducing the number of patients attending an additional clinic for non-specialist advice.

Microarterial anastomosis: Physics says we're doing it right, mostly

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Introduction

Sutured microarterial anastomoses are carried out routinely within the practice of many plastic surgeons. Despite a range of suture techniques, recent clinical studies demonstrate no difference in patency between them. The caveat being '*provided standard microsurgical principles were adhered to*'.

Aim

This study investigates the extent to which individual aspects of suture placement influence local haemodynamics within microarterial anastomoses.

Materials and methods

Micrographs of anastomoses in chicken vessels were assessed for bite width, suture angle and suture spacing. Computational geometries were created using these measurements. Vessel simulations were performed using Computational Fluid Dynamics (CFD) software in 2.5mm diameter ducts with blood as the working fluid.

Key results and statistical analysis

Particular focus has been placed on the physical property of Shear Strain Rate (SSR), a known precipitant of intravascular platelet activation and thrombosis. Suture bite angle and spacing caused statistically significant higher local SSRs ($p=0.00004$), when simulated at extremes of surgical practice. A combined simulation, representing optimum technique, created a more favourable SSR profile.

Conclusions

- Haemodynamic changes associated with optimum suture placement are unlikely to influence thrombus formation significantly.
- Sutures placed at severe angles, or too closely together, are more likely to precipitate thrombus.
- These physical findings support adherence to basic principles of microsurgical practice.

Electrochemotherapy for locoregional control and palliation of metastatic melanoma

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Introduction

Following NICE approval, multidisciplinary teams are increasingly recommending electrochemotherapy (ECT) for locoregional control and palliation of metastatic melanoma. The procedure uses electroporation to facilitate the accumulation of cytotoxic concentrations of bleomycin within cutaneous metastases and has demonstrated promise. We present our early experiences at North Bristol.

Methods

Case note review was undertaken for all patients who received ECT for metastatic melanoma between November 2012 and April 2015 at North Bristol NHS Trust. For each patient, diagnosis, demographics, treatment parameters and clinical outcomes were analysed.

Results

During the study period, 32 episodes of ECT were undertaken in 26 metastatic melanoma patients (12 sup. spreading, 11 nodular, 2 acral lentiginous and 1 lentigo maligna). Intralesional bleomycin injection was undertaken during 4 procedures and surgical debulking of disease in 13 procedures. The mean time till recurrence following first-episode ECT was 5.6 months. Post-procedure sequelae were reported in 13 patients (post-ECT pain: 10 patients, wound-healing problems: 2 patients, dyspnea: 1 patient)

Discussion and Conclusion

ECT is an effective modality for palliation and temporary locoregional control of metastatic melanoma. Despite being uncomfortable post-procedure, the procedure is well tolerated by patients, repeatable and can improve quality of life with a limited side-effect profile. Concomitant intralesional and intravenous injection of bleomycin, and lesional excision followed by adjunctive ECT may improve efficacy although on-going appraisal of outcomes is required.

The “linguine technique” – a case series

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Introduction

The delineation of peripheral borders for lesions such as lentigo maligna is often a clinical challenge. Irregular, poorly defined edges accompanied by subclinical micro-satellites of disease mean that surgery is often complicated by incomplete excision at the peripheral margin. This is particularly the case in instances where narrow-margin excision must be employed for cosmetically or functionally sensitive areas. We advocate the “linguine technique” as a way of ensuring histologically confirmed complete excision of cutaneous in-situ lesions.

Methodology

We outline the step-by-step process of the “linguine technique” and present the first cases at our institution where the technique has been employed by the senior author over a one-year period.

Results

We have successfully employed the “linguine technique” in the management of three patients: two cases of lentigo maligna and lentigo maligna melanoma within the head and neck and a single case of peri-scrotal extramammary Paget’s disease. The first-stage of the “linguine technique” was successfully combined with sentinel lymph node biopsy in one patient. Post-operatively, there have been no instances of locoregional recurrence and good cosmetic outcomes.

Discussion and Conclusion

The “linguine” technique is a versatile procedure that facilitates the thorough longitudinal assessment of peripheral margins prior to complete excision of melanotic and non-melanotic skin cancer. It is within the skill set of any plastic surgeon and avoids the need for open wounds whilst marginal clearance is awaited. It is particularly suitable for cosmetically or functionally sensitive areas.

Metabolomics: a novel approach to study longitudinal metabolic responses to thermal injury

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Healing Foundation Centre for Burns Research

Introduction

The sequelae of severe thermal injury can include a hypermetabolic state, acute systemic inflammation, sepsis, multiple organ failure (MOF) and death. The Scientific Investigation of Biological pathways Following Thermal Injury (SIFTI) Study is a multi-centre study in the UK is working to identify metabolic changes to be applied to derive new treatment options for hypermetabolism.

Methods

Longitudinal serum samples were collected from day 1 to day 180 from 21 patients admitted to the Queen Elizabeth Hospital in Birmingham UK with burns greater than 15% TBSA. Serum was prepared by deproteination followed by reversed phase UHPLC-MS. Data were processed (XCMS), metabolites were annotated followed by univariate, multivariate and correlation analysis.

Results

The study group had a mean age of 33.8 years, a mean burn size of 36% TBSA and male to female ratio of 13:8. LC-MS analysis of serum samples, showed three distinct metabolic phases following thermal injury: Day 1-5, Day 5-12 and Day 12 onwards. Changes in groups of fatty acids, oxidised fatty acids. TCA cycle metabolites showed early catabolism and a shift towards anabolism after Days 12-15 post-burn. Significant changes were also observed in steroid hormones, bile acids, vitamin D metabolites and serotonin. All metabolites discussed showed a statistically significant change ($p < 0.05$) applying the Benjamini-Hochberg procedure.

Conclusions

This is the first longitudinal metabolomics study of serum from burn injured patients and this novel approach allows a global view of metabolic changes acutely and during the various stages of the hypermetabolic response. This approach has potential in developing personalised healthcare approaches to improve burn care.

Incidence of residual tumour in incompletely excised non-melanocytic malignant skin lesions: an audit cycle completed

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Introduction

Surgical excision remains the mainstay of treatment for malignant skin lesions. The British Association of Dermatology state there should be incomplete excision in less than 5% of patients. Of those undergoing re-excision, the histology is typically positive for residual tumour in 40-50% of cases.

Aims

To assess the incidence of incomplete excision on histological report and residual tumour present in re-excision specimens.

Methods

The audit cycle consisted of all non-melanocytic skin malignancies excised between 01/10/2010-30/09/2011 (baseline audit) and 01/01/2012-30/09/2014 (re-audit). Incomplete excisions were identified from the histology database and histological findings of all re-excisions were noted.

Results

The results from the first audit (see table) were presented at the skin MDT operational meeting: it was stressed

that for low risk patients, morbidity needs to be considered before deciding to re-excise. Additionally, all margins/ incomplete excisions are now routinely verified by two consultant histopathologists.

Conclusion

Whilst it is difficult to directly assess the effect of double verification and more careful treatment planning in patients with an incomplete excision report, the changes appear to have led to the significant fall in incomplete excision reporting and higher presence of residual tumour in re-excised specimens. This has resulted in fewer patients undergoing unnecessary surgery with potential complications.

	Baseline audit	Re-audit
Incomplete excision rate (incomplete excisions/total no. specimens)	4.56% (27/593)	2.38% (43/1807)
% of residual tumour in re-excised specimens (re-excisions +ve residual tumour/total no. re-excisions)	14.8% (4/27)	65% (13/20)

A validated human model for cooling of partial thickness burns

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Weatherall Institute of Molecular Medicine

Introduction and aims

Cooling of burns is a well-established part of first aid and acute burn management, but its mechanism is poorly understood. Our aim is to validate a model of cooling partial thickness burns to human skin as a means of investigating its transcriptomic effects.

Materials and methods

With ethical approval, Zone 4 of the DIEP flap- normally discarded- forms the basis for our model, using purpose-built apparatus for both burn-creation at 70°C and 5-60 seconds contact time, and cooling at 16°C for 20 minutes. Burns were created after anaesthesia, and harvested at 1-3 hours with paired controls. Histological measurement of the depth of microvascular occlusion was used as a marker for burn-depth. Comparisons were made between burns created with 5-60 second burns, and between cooled and non-cooled burns. Cooled and non-cooled burns were compared within the same patient with the paired t-test.

Results

25 patients were recruited. Histologically, 7.5 seconds contact-time gave a consistent mid-dermal injury and used for all subsequent burn-creation.

Cooling significantly reduced burn-depth at 1 hour ($p=0.017$) and 3 hours ($p=0.0024$). Both cooled and non-cooled burns showed significant biological progression from 1 to 2 hours ($p=0.014$ cooled, 0.017 non-cooled) and from 1 to 3 hours ($p=0.042$ cooled and 0.015 non-cooled)

Conclusions

We have shown a statistically significant reduction in burn depth through cooling. The model is biologically active, as evidenced by the progression of burn-depth with time, and its response to cooling. Cooling appears to protect the dermal microvasculature. Transcriptomic analysis of paired samples from each specimen should provide candidate pathways that mediate this effect.

Primary Lengthening Temporalis Myoplasty in Cancer Patients – A Case Series

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Introduction

Lengthening Temporalis Myoplasty (LTM) is a technique used for facial reanimation. Over 100 LTMs have been performed in our unit; of these 11 were performed as a primary facial reanimation procedure following cancer resection sacrificing the extra-temporal facial nerve. We have reviewed our practice and reflect on the key learning points.

Methods

We retrospectively reviewed medical notes. Data collected included demographics, pathology and surgical outcomes.

Key Results

Case 1: An 86 year old male who had a recurrent SCC in left parotid from an ear primary. He underwent a radical parotidectomy, primary LTM and radial forearm flap followed by adjuvant chemotherapy. This case demonstrates how a LTM can be performed synchronously with a free flap.

Case 2: A 62 year old male who had parapharyngeal squamous cell carcinoma involving the right facial nerve in the parotid tail. A radical parotidectomy, cervicopectoral flap and primary LTM were performed. This case highlighted radiotherapy can result in tightening of the temporalis muscle. Lipomodelling can also be used to improve cheek volume.

Case 3: 89 year old female who had adenoid cystic carcinoma of the right parotid. She underwent a radical parotidectomy and primary LTM followed by adjuvant radiotherapy. This case underlined that dentures can result in difficulty with active movement post-operatively.

Conclusions

This case series underlined a number of learning points in this specific cohort, namely: the effect of radiotherapy on results, the role of lipomodelling, how dentures impact on patient outcomes and the importance of physiotherapy in the success of this technique. In our experience, we have found LTM is a practical solution to facial palsy in cancer patients.