

HIP RESURFACING IN ACTIVE MILITARY PERSONNEL

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Hip osteoarthritis is uncommon in active military personnel but can be extremely debilitating. Previously in such cases total hip replacement was usually delayed as long as possible. The two main reasons for such reluctance were that these persons would be graded P7 Permanent after total hip replacement and that the amount of physical activity an active military person does would lead to early loosening of implant and revision surgery. Resurfacing Arthroplasty has allowed us to take an earlier and more interventional approach in younger active patients.

We describe our early results of 18 hip resurfacing operations in active serving military personnel. Average age was 48 years. All 18 were done in MDHU Northallerton by one in-service orthopaedic consultant in 2004 and 2005. There were no serious complications; average length of stay was 5.5 days. Specifically there were no fractured necks of femur and there were no early signs of component loosening. Final grading after six months was P3.

Hence we now recommend that in selected active military personnel where anatomy permits early hip resurfacing should be considered rather than a conventional hip replacement.

THE EARLY RESULTS OF OPEN SURGERY FOR TREATMENT OF HIP IMPINGEMENT SYNDROME

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Introduction

Femoroacetabular impingement (FAI) causes anterior hip pain, labral tears and damage to the articular cartilage leading to early osteoarthritis of the hip. Surgical hip dislocation and osteoplasty of the femoral neck and acetabular rim is a technique pioneered by the Bernese group for the treatment of FAI. We present and discuss our results of this technique.

Methods

Functional outcome was measured using the Oxford hip and McCarthy non-arthritic hip scores pre and post-operatively.

Results

Since January 2003, 36 hips in 34 patients (average age of 43 years (14-65)) underwent surgical hip dislocation for treatment of FAI. In 9 hips, grade 4 osteoarthritis was present in greater than 10 x 10mm regions after reshaping of the abnormal anatomy. In these cases, hip resurfacing was performed.

Of the 27 hips preserved, 14 had chondral 'carpet' flaps debrided, 17 underwent recession of the acetabular rim at the site of impingement, 6 had removal of medial osteophytes, 6 had labral and/or bony cysts excised and grafted and 1 underwent an osteochondral graft.

Oxford Hip Score improved from an average 36 (range 17-59) to 23 (12-45) and McCarthy hip score from 43 (9-74) to 62 (36-72) in the preserved hips at an average 15 months following surgery (range 6-33 months).

Discussion

The early results of surgical hip dislocation are encouraging. Careful patient selection is important in order to exclude patients with hip osteoarthritis. Long-term follow-up is required to see if this technique prevents the natural progression to osteoarthritis.

THE USE OF A HYDROXYAPATITE COATED DISTALLY LOCKING FEMORAL PROSTHESIS IN REVISION HIP SURGERY IN THE ELDERLY

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Introduction

We report the early results of the hydroxyapatite coated, distally locking Cannulok revision hip prosthesis. The component was used to treat difficult periprosthetic and pathological fractures, often in the presence of aseptic loosening or infection in a group of elderly patients.

Methods

16 patients with a mean age of 78 years underwent surgery by a single surgeon over a period of 3 years. No patients have been lost to follow-up and they have been followed up clinically and radiologically for an average of 24 months.

Results

The mean modified Merle D'Aubigne and Oxford Hip Scores were 14 and 23.6 respectively. These results are comparable to the published results for the previous uncoated version of the Cannulok hip, and other revision hip series.

Discussion

We believe the HA coated distally locked Cannulok revision hip implant provides a relatively simple and effective reconstructive option that can be used as an alternative to more extensive surgical options in elderly patients with periprosthetic fractures.

PREOPERATIVE ASPIRIN USE IS AN INDEPENDENT PREDICTOR OF INCREASED POSTOPERATIVE TRANSFUSION REQUIREMENT IN TOTAL HIP REPLACEMENT.

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Introduction:

The recent BOA blue book on blood conservation in elective orthopaedic surgery highlighted the need for blood saving strategies to be implemented. Perioperative management guidelines of oral anti-coagulation and anti-thrombosis medication have to date concentrated on warfarin use. Information and guidelines on aspirin usage in elective orthopaedics and its effects post operatively are limited.

Methods:

Data was collected prospectively from 1936 patients who underwent 2024 primary unilateral total hip replacement in a single institution. All patients were treated with the same postoperative transfusion regime and thromboembolic prophylaxis. Preoperative medication, haemoglobin levels and patient demographics were recorded by a standard assessment. Post op transfusion requirements and haemoglobin levels were noted throughout the postoperative period.

Results:

Multivariate analysis revealed that preoperative aspirin use was a significant independent predictor of postoperative transfusion requirement ($p < 0.001$).

Discussion:

Expanding indications for the use of aspirin for primary and secondary cardiovascular disease prevention have meant that large numbers of our patients undergoing total hip replacement are concurrently taking the drug. With increasing and emerging evidence of the risks involved in blood transfusion, including vCJD transmission and immune related reactions coupled with reduced supplies of donor blood further measures to reduce transfusion requirement are needed. We recommend that in the absence of absolute contraindications to stopping aspirin therapy, it should be omitted for 1 week prior to total hip replacement.

GTN AND ACHILLES TENDINOPATHY - DOES IT WORK AND IF SO, HOW?

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Introduction

A recent clinical study has suggested that topical GTN may improve the outcome of non-insertional Achilles tendinopathy. The mechanism for this improvement is obscure but is thought to be due to modulation of local nitric oxide (NO) levels. The purpose of this study was to assess the clinical and histological results of topical GTN for non-insertional Achilles tendonitis.

Methods

40 patients with non-insertional Achilles tendonitis underwent standard non-operative therapy. 20 patients also used topical GTN daily. AOFAS, AOS visual analogue scores and SF36 forms were completed pre-treatment and 3 months later. Patients who failed conservative treatment and underwent surgery had histological examination of the Achilles tendon and histochemical analysis for isomers of NOS (eNOS and iNOS) as a marker of NO production.

Results

There was an overall improvement in symptoms in both groups but no significant difference in the improvement between them - there was no additional benefit in using GTN patches. 4 patients also had to stop using patches within 3 weeks because of headaches.

Histological examination did not show any difference in collagen synthesis or remodelling between the 2 groups and there was no evidence of stimulated wound fibroblasts in the GTN group. There was no difference between the groups in the expression of eNOS or iNOS.

Conclusion

This study fails to demonstrate any improvement in symptoms when using GTN patches. There is no histological evidence that GTN promotes degenerate tendon to stimulate wound fibroblasts and increase collagen synthesis and remodelling. GTN patches do not appear to modulate the expression of NOS enzymes in diseased Achilles tendon. The use of GTN patches in the treatment of non-insertional Achilles tendonitis remains questionable and the role of NO as a mediator of inflammatory response remains elusive.

PERCUTANEOUS RETROGRADE DRILLING OF OSTEOCHONDRAL LESIONS OF THE TALUS USING COMPUTED TOMOGRAPHY GUIDANCE

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INTRODUCTION:

Symptomatic osteochondral lesions of the talus have been managed with a variety of operative techniques involving open or arthroscopic approaches to the ankle joint. The purpose of this study is to report our technique of drilling stable osteochondral lesions of the talus via a percutaneous retrograde approach using computed tomography for guidance.

MATERIALS AND METHODS:

Seven adult patients with Berndt and Harty Stage 2 or 2A/5 (subchondral cyst positive) talar osteochondral lesions, confirmed by magnetic resonance imaging, had retrograde drilling with CT guidance performed under local anaesthesia. Follow-up MR imaging was performed to investigate radiological evidence of healing.

RESULTS: All retrograde drillings performed were technically successful.

DISCUSSION: The concept of retrograde drilling is to preserve intact articular cartilage while encouraging revascularisation of the osteochondral fragment. The use of CT allowed drilling without conventional direct visualisation of the articular surface via arthrotomy or arthroscopy. The procedure can therefore potentially be performed in an outpatient setting. Suggestions are made from review of the literature as to improve further the technique for future studies.

THE SHORT-TERM OUTCOMES OF SURGICALLY TREATED OSTEOCHONDRAL LESIONS OF THE TALUS.

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Osteochondral lesions (OCLs) of the talus are not uncommon, the diagnosis of which requires a high index of suspicion and is often delayed. The purpose of this presentation is to raise awareness and discuss treatment outcomes of OCLs.

All patient notes with a diagnosis of talar OCL over a 12-month period were retrospectively analysed. A telephone questionnaire was then performed in which patients were asked to compare current symptoms to preoperative symptoms using a numerical scoring system.

There were thirteen patients with a mean age of 31. A history of trauma was present in eleven (85%) and all had activity related pain. OCLs were evident on plain radiographs in six (46%). The diagnosis was made in the remainder on MRI or at arthroscopy. Median time between initial orthopaedic assessment and diagnosis was 4 months (0-100). The OCLs were medial in six (46%) and lateral in seven (54%). Eleven patients were treated with excision and penetration of subchondral bone, 1 underwent open fixation and 1 had an isolated chondral lesion treated conservatively. Mean follow-up was 6 months (2-14). Seven (54%) had minimal or no symptoms and three (23%) only after prolonged activity. Ten (77%) were better than before surgery, one (8%) the same and two (15%) were worse. The three patients who were the same or worse had had a delay in diagnosis of over 12 months.

Patients with talar OCL often have persistent ankle pain which remains undiagnosed. Early diagnosis and treatment offers the best chance for a good outcome.

THE ROLE OF HINDFOOT STIFFNESS IN THE DORSAL BUNION

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Introduction

The term dorsal bunion describes a condition characterised by a swelling in the region of the 1st MTPJ with an elevated first metatarsal and a flexed toe. The literature available concentrates on the forefoot aetiology- no author has yet documented the role of the hindfoot in its pathogenesis.

Methods

We have conducted a review of 42 consecutive patients, excluding those with hallux rigidus collected prospectively in the course of a full-time foot and ankle practice between 1996 and 2006. All of the patients have been examined with respect to their primary pathology leading to the dorsal bunion and had the mobility and position of the hindfoot assessed.

Results

In the series of 42 patients, the average age was 29.5 and there were 23 male and 19 females. Every patient examined had either a rigid hindfoot or stiffness contributing to a failure to correct for abnormal forefoot position.

Conclusion

The causes of dorsal bunion may be considered to be Primary (Hallux Rigidus) or Secondary (CTEV, neurogenic, iatrogenic, global forefoot supination).

It is the authors' view that hindfoot stiffness in secondary cases of dorsal bunion causes an inability of the foot to compensate for an abnormal position of the forefoot- the 1st ray must compensate by flexion of the hallux to allow the foot to adopt a plantigrade position.

EFFECTIVENESS OF PRE-OPERATIVE COUNSELLING ON SMOKING PATTERNS OF PATIENTS UNDERGOING ELECTIVE FOREFOOT SURGERY

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Cigarette smoking prior to and following foot surgery is well recognised as resulting in a higher complication rate. The purpose of this study was to determine the effectiveness of pre-operative counselling prior to elective hallux valgus surgery.

A prospective record of smoking histories was taken in all patients prior to surgery. They were counselled as to the increased complication rate and advised to stop prior to surgery and in the immediate peri-operative period. The mechanism of the increased complication rate was explained to improve their understanding to stop smoking. They were advised to see their GP for specific strategies and medications. Further smoking history was taken on admission and in review clinics. A telephone survey was then conducted to ascertain their smoking pattern following discharge from follow-up.

Forty-two patients underwent hallux valgus surgery over a 12 month operating period. Ten (23%) were recorded as smokers at the time of initial consultation. Most patients (80%) were unaware of the detrimental effects of smoking following foot surgery. Patient education was effective in providing an impetus to stop or reduce smoking in 6 (60%) patients pre-operatively. One further patient subsequently desisted from smoking following surgery. Only two patients had re-commenced smoking following surgery implying a long term change of behavior. Only one complication of a DVT occurred in a patient who continued to smoke.

This small study has shown the effectiveness of educating our patients in the importance of giving up smoking prior to elective foot surgery.

DAY-CASE OPEN SHOULDER SURGERY– A PROSPECTIVE STUDY OF A PERI-OPERATIVE PROTOCOL

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OBJECTIVE: To evaluate a peri-operative protocol developed to facilitate day case open shoulder procedures that historically have required overnight hospital admission.

METHODS: 75 consecutive day-case open shoulder procedures were performed in 75 patients (aged 18 – 65) followed up prospectively for a minimum of 6 months. The procedures included Open Primary Anterior Capsulo-Labral Reconstruction (ACLR) (24), open Revision ACLR (4), open Posterior Capsulo-Labral Reconstruction (1), mini-arthrotomy and rotator cuff repair (6), mini-arthrotomy and subacromial decompression (27), modified Weaver Dunn Reconstruction of Acromio-clavicular joint (ACJ) (2), decompression of ACJ (7), open release (Ozaki procedure) for frozen shoulder (1). Exclusion criteria included concomitant medical problems, and patients who would have no assistance in their care for the first 24 post operative hours. All patients received fast track general anaesthesia, peri-operative analgesia using intravenous Fentanyl, and Diclofenac (PR), and local Bupivacaine 0.5% to incisions and intra-articular spaces; patients were discharged with oral analgesics.

MAIN OUTCOME MEASURES: Patient satisfaction with overall experience, pain control, the incidence of nausea that was difficult to manage, the incidence of unplanned admission, attendance or delayed admission to hospital, postoperative complications.

RESULTS: 98% of patients were satisfied with their pain management. None of the patients suffered intractable post operative pain nausea or vomiting or required unplanned hospital admission or unexpected re-admission. All the patients were satisfied with their experience. There were no short or long term post operative complications.

CONCLUSION: The anaesthetic protocol and surgical techniques used in this study permitted same day discharge for a wide variety of open shoulder procedures. For selected patients, open shoulder surgery as a day case appears safe effective and acceptable to the patient.

A RANDOMISED CONTROLLED TRIAL OF TREATMENT OF THE PAINFUL ARC OF THE SHOULDER – TPARC

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Introduction

Shoulder pain represents a significant burden of disease in the general population, yet there is a lack of evidence about the effectiveness of routinely used interventions such as corticosteroid injection and physiotherapy.

Methods

Over a six-month period patients with “painful arc” of less than six months duration were recruited via their GPs.

Eligible patients randomised to one of four arms of the study: control (normal analgesia and/or non-steroidal anti-inflammatory medication), a specified and repeatable Exercise and Manual Therapy Package (EMTP), a course of up to three subacromial steroid injections or both the EMTP and the steroid injections. Follow-up was for 18 weeks, with postal questionnaire at one year. The primary outcome measure was the Oxford Shoulder Score (OSS).

Results

186 patients were referred, 112 were randomised. Mean age was 54.5 years. Ninety patients completed the trial. Sixty-two returned the follow-up questionnaire.

By analysis of covariance, no significant differences were found between the OSS scores or SF-36 (physical health total) at the beginning and end of the trial, or at one year. Two patients in the injection group went on to surgery, along with one each in the control and EMTP groups. No significant differences were found between treatment groups.

Conclusion

We have found no significant differences in outcome between steroid injections, physiotherapy, both treatments, and symptomatic treatment in a group of patients with early painful arc of the shoulder. Further, larger studies may be needed to find small differences in outcome between these treatments.

A LONG TERM FOLLOW-UP STUDY OF 44 SOUTER-STRATHCLYDE ELBOW ARTHROPLASTIES CARRIED OUT FOR RHEUMATOID ARTHRITIS

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Introduction

The long term results of a previously published (*J Shoulder Elbow Surg.* 2002 Sep-Oct; 11(5):486-492) series of 44 primary Souter-Strathclyde total elbow arthroplasties performed on 36 patients with rheumatoid arthritis by a single surgeon in a district general hospital are presented.

Methods

Of the 36 patients 14 patients had died leaving 22 patients or 28 elbows that could be followed up with a mean follow up of 11 years (range 9.7-17.8 years). Patients were followed up in research clinics. They underwent plain radiographs and clinical examination. The notes of the deceased patients were reviewed.

Results

In the surviving patients 60% reported complete freedom of pain, 28% mild intermittent pain and 11% moderate pain. The mean range of motion at follow up was 91 degrees (range 30-130 degrees). This represented a mean gain of 15 degrees of flexion, but only a 1 degree gain in extension. Fourteen elbows had a range of motion of 100 degrees or greater compared with 9 before surgery.

In the deceased patients 2 patients had undergone revision and the remaining patients had died of causes unrelated to the surgery with the prosthesis intact. There was 1 permanent ulnar nerve palsy and two deep infections one requiring debridement. Eight of the original 44 primaries required revision, 3 for fractures and 5 for loosening.

Discussion

In patients with rheumatoid arthritis and low functional demand, the Souter-Strathclyde total elbow arthroplasty performs well in abolishing pain and increasing independence in carrying out the activities of daily living.

A STUDY TO EXAMINE SYMMETRY IN THE ROTATIONAL ALIGNMENT OF FINGERS USING DIGITAL PHOTOGRAPHY AND IMAGE ANALYSIS

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Introduction

It is said that God gave us paired bilateral anatomical structures so that the trauma surgeon can compare the injured side with its uninjured counterpart. The axial rotational alignment of fingers, when disrupted by injury, may lead to scissoring. During examination, comparison is made between the rotational alignment of injured and uninjured fingers. This assumes that the rotational alignment of the fingers is symmetrical. A study was performed to ascertain normal rotational alignment, and establish whether this assumption is valid.

Materials and Methods

Standardised digital images were taken with fingers in extension. These were analysed using the angle-measuring tool on Adobe Photoshop™ software. The rotational angle used was that between a line joining the radial and ulnar borders of the nail plate, and the horizontal.

Results

Mean angles of rotation were 13° for the index finger, 10° for the middle, 5° for the ring and 12° for the little. Differences in the angle for ring and little fingers between the sides were not significant; these fingers are symmetrical. Index and middle fingers demonstrated statistically significant asymmetry of 2.6° (SD +/- 4.2°).

Discussion

Previous work has sought to quantify rotational alignment in cadavers or using wire markers and fluoroscopy. A new method, using digital photography and image analysis is described. We determined mean angles, showing symmetry of the ring and little but asymmetry of index and middle. Previous work has suggested that up to 10° of rotation can be tolerated. With only 2.6° of difference, clinical comparison of sides remains appropriate.

USE OF IMPROVISED HAND EXTERNAL FIXATOR IN THE FIELD HOSPITAL.

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Abstract:

Open phalangeal and metacarpal fractures of the hand were stabilised using an improvised external fixator. This was in the field hospital in Iraq and on military personnel evacuated to the UK. The fixator was improvised from K-wires and a syringe, both of which are readily available in the field hospital. It is a unilateral frame, sufficiently stable to maintain fracture reduction but not too rigid so as to allow micro-motion for fracture healing. We describe our method and recommend this simple method as a quick and easy form of initial or definitive fracture stabilisation in the hand. In the hostile environment of the field hospital we found this method simple, cost effective and relatively safe.

THE SURGICAL MANAGEMENT OF COMPLEX TIBIAL AND FEMORAL NON-UNION – IS RETURN TO WORK PREDICTABLE?

Authors

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Introduction

We studied the radiological and functional outcome in patients treated for complex femoral and tibial non unions with the Ilizarov method, specifically analysing the data for factors that may predict return to work.

Methods and Results

78 patients were treated for femoral and tibial non-union at our institute between January 1992 and December 2003. Of these 40 patients (41 non-union) satisfied the criteria for complex non-union. 18 patients who were working at the time of injury failed to return to work and 7 had returned to work. 16 were not employed at the time of injury and were excluded from the analysis. Functional and radiological outcome was assessed using the Association for the Study and Application of Methods of Ilizarov (ASAMI) criteria. The minimum follow up was 18 months after removal of the frame.

Qualitative data for age, time to Ilizarov treatment, number of surgical procedures and time to union did not differ between the two groups (*Student t-test*). Those returning to work were more likely to have had a hypertrophic non union ($p < .025$) and were less likely to be using a walking aid ($p < .05$). No difference was seen between the groups with regards to segment involved, smoking, NSAID use, associated injuries, previous fixation, length of bone defect, free flap coverage, presence of infection, radiological and functional score.

Discussion

Our results suggest that return to work following Ilizarov treatment of a complex non-union does not correlate with either the biology of the fracture, the time course of treatment or the final result. We hypothesise that it is likely to be related to personality traits of the patients.

OSTEOPERIOSTAL DECORTICATION FOR THE TREATMENT OF ESTABLISHED FRACTURE NON UNION AND MALUNION

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Introduction

The concept of osteoperiosteal decortication for the treatment of fracture non-union and malunion was introduced by Judet in the early 1960's. Over 1000 cases have been treated with a union rate of 80 – 90%.

Methods

A review of the clinical notes and plain radiographs was carried out on 21 patients who underwent osteoperiosteal decortication between 2002 and 2004. There were 11 male and 9 female patients with 14 femoral, 5 tibial and 2 humeral fractures. 18 patients had non unions and 3 patients malunions. The mean time from fracture to surgery was 8.2 months for the non-unions (range 6 to 16 months) and patients had previously had a mean of 1.8 procedures (range 0 to 4) prior to the index decortication procedure.

Results

19 patients progressed to union (90%). 9 patients had complications (43%). There were 6 failures of fixation requiring revision surgery and 4 deep infections (2 of which proceeded to amputation). In 4 patients supplementation of the decortication with bone graft or BMP was performed.

Discussion

This series represents the learning curve of the senior surgeon using this technique. In the treatment of complex non-unions or malunions, the use of osteoperiosteal decortication can achieve a union rate of 90%. However there are high complication rates although the complications are usually salvageable. In this series the infection rate in the distal tibial was noted to be especially high with 3 out of the 4 infective complications being in the tibial fractures.

PREPARATION FOR THE NEXT MAJOR INCIDENT: ARE WE READY?

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Mr Cosker (SPR)
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Introduction

In 1996, Carley and Mackway-Jones examined British hospital readiness for a major incident. In the light of recent terrorist events in London, we revisited the issue and conducted a telephone survey of relevant parties to investigate whether the situation has changed almost 10 years on.

Material and methods

Middle grades in anaesthesia, accident and emergency medicine, general surgery, and trauma and orthopaedics were telephoned in trauma units across the UK and asked questions a proforma. Major incidents co-ordinators for each of the units were contacted, and their planning readiness, training opportunities, and recent rehearsals were assessed through a second proforma.

Results

A total of 179 middle grades were contacted in 34 different units throughout the UK, 144 responses were obtained. 47% had not read any of their hospitals major incident plans. Only 54% felt comfortable in the knowledge of their specific role in a major incident. Major incident co-ordinators were contacted at all 34 hospitals, and 50% responded. Rehearsal of major incident plans varied widely between hospitals with 82% of hospitals having practised within the last 5 years but only 35% planning for the next 12 months. Through real or rehearsed major incidents 95% of co-ordinators said errors were identified in their major incident plans. Limitations to improvement included: lack of funding, designated full time major incident planning co-ordinator, and lack of technology. There was no significant difference between units in London and those in other regions.

Discussion

Preparedness for major incidents in the UK remains poor despite 10 years since this was last assessed. Effective major incident plans require forethought, organisation, briefing of relevant staff and regular rehearsal.

PENETRATING LIMB TRAUMA IN THE UK MILITARY, IN TRAINING AND IN PRACTICE.

Surg Lt Cdr S J Mercer RN, Surg Lt Cdr D E Ayers RN

It is well recognised that there is a requirement for military surgeons to treat the victims of penetrating trauma while on operations. Casualty templates from recent and past conflicts demonstrate that a high proportion of survivable injuries affect the limbs; expertise in the management of penetrating trauma to the limbs is clearly important. While it is widely agreed that a combined specialities approach to limb injuries is necessary, debate has been ongoing for some time in the UK military as to the most appropriate means to gain the necessary experience for treating the wounds encountered on operations.

This study examines the operational requirement, looking at data and individual cases from Iraq, and considers the relevance of a training placement at The Johannesburg General Hospital, a level 1 trauma centre in South Africa.

Surgeon Lt Cdr Mercer RN is currently a Specialist Registrar in Vascular Surgery at MDHU Portsmouth and Surgeon Lt Cdr Ayers is a Specialist Registrar in Plastic Surgery at Frenchay Hospital in Bristol.

TALAR NECK FRACTURE BY A NOVEL MECHANISM- THE BIOMECHANICS OF VEHICLE AIRBAG TRAUMA

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Abstract

We present the case of a 19-year-old woman who sustained a right talar neck fracture when the car in which she was travelling was involved in a high-speed collision. She was a front seat passenger travelling with her feet up on the dashboard, and was injured when the passenger airbag deployed. Front airbags are designed to provide protection from impact injury by having the occupant “fall” into the already-inflated device, and in order to inflate quickly enough they rely on an explosive exothermic reaction. It is postulated that an inflating airbag has similar properties to a blast wave produced by an explosion, and thus if a person is in direct contact with an *inflating* rather than *inflated* airbag, they may sustain high energy transfer injuries, not dissimilar to blast wave injuries. Although airbags have undoubtedly lead to safer motoring, it is well known that they can cause serious injury in normal usage, and injuries to the face, neck, chest and abdomen have been well documented. They should not be thought of as entirely benign devices.

PREDICTING THE OUTCOME OF SCIATICA – THE USE OF THE NOTTINGHAM HEALTH PROFILE AND OSWESTRY DISABILITY INDEX.

Authors: A Abraham, A Mountain, TI Sherief, SM Green, S Roysam, JL Sher.

Background

The usefulness of the Nottingham Health Profile as a generic quality of health outcome measure has been described in a number of Orthopaedic conditions. This study was done to compare two quality of life questionnaires, the Nottingham Health Profile (NHP) and the Oswestry Disability Index (ODI) regarding the internal consistency, validity and responsiveness as outcome measures in patients undergoing surgery for lumbar nerve root decompression. We also assessed the effects of smoking, type of lesion, clinical presentation, number of levels involved, operating surgeon and duration of symptoms.

Methods

37 patients with clinical nerve root entrapment, confirmed radiologically were treated with decompression surgery by two surgeons. We used the NHP and the ODI to assess the severity of symptoms prior to and at 3 and 8 months following surgery

Results

We were unable to detect factors predictive of better healthcare outcome scores after surgery for sciatica. There was a statistically significant improvement in the total ODI score and all NHP domain scores within the whole cohort, after treatment. NHP had a greater responsiveness in detecting improvement for pain and physical ability as measured by the effect size. Cronbach's alpha for reliability of scores was consistently above the acceptable threshold of 0.90 for NHP scores and consistently below 0.90 for ODI scores. A "floor and ceiling" analysis revealed that the NHP consistently skewed scores at 3 months post op towards a better outcome compared to the ODI.

Conclusion

The generic Nottingham Health Profile appears to be a more sensitive health questionnaire than the Oswestry Disability Index in assessing the outcome of nerve root decompression surgery. We were unable to identify factors predictive of better outcomes using these scores as outcome measures.

OBJECTIVE ASSESSMENT OF ARTHROSCOPIC SURGICAL SKILLS.

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Background:

Objective assessment of technical skill in orthopaedic surgery remains elusive. The general surgeons have validated a motion analysis model as a measurement of surgical ability for laparoscopic procedures. The aim of this study was to validate the motion analysis model in the context of simulated shoulder arthroscopy and use it to assess technical ability in a mixed population.

Methods:

35 volunteer subjects were recruited from the Oxford University Medical School and the Nuffield Orthopaedic Centre and stratified into groups according to their professional background. There were seven groups: consultant arthroscopic orthopaedic surgeons; senior orthopaedic SpRs (year 5/6); junior orthopaedic SpRs (year 1/2); basic surgical trainees; musculoskeletal physicians; graduate medical students; and hospital managers. Each subject completed a questionnaire to record previous arthroscopic experience and underwent psychometric testing. After receiving standardised instructions, each subject performed one diagnostic and one therapeutic procedure using the Alex Shoulder Professor (Sawbones Europe AB, Malmo, Sweden) model. The Patriot (Polhemus, Colchester, USA) electromagnetic tracking system was used to track hand movements during each procedure.

Results:

We present the results of psychometric testing and motion analysis (time, distance and number of hand movements) data in subjects with a variety of experience of arthroscopic surgical techniques. We have demonstrated differences between the groups.

Conclusions:

Objective assessment of arthroscopic surgical skills using motion analysis is valuable in identifying differing surgical abilities. We believe that this may help with the career development of trainees and in the development of specific teaching programmes for arthroscopic surgery.

Physiological penalties of prolonged hypotensive resuscitation

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Currently there is a move away from normotensive (ATLS-style) fluid resuscitation of trauma casualties towards hypotensive strategies (NICE guidelines 2004). However, supporting evidence is restricted to penetrating injuries with short delays to definitive surgery. The objectives of this study were twofold: to compare normotensive vs hypotensive fluid resuscitation over a longer timescale and assess the effects of primary blast injury on this response since these may become an increasing problem in military and civilian mass-casualty settings.

A randomised prospective cohort study was conducted on splenectomised pigs (45-65 kg) terminally anaesthetised with alphadolone/alphaxolone. Animals were subjected to primary blast injury or sham blast. All animals received a controlled haemorrhage (30% estimated blood volume), 5 min shock period followed by intravenous infusion of 0.9% saline according to one of two protocols:

1. Normotensive (28.6 ml/kg at 3 ml/kg/min) plus further aliquots to maintain systolic blood pressure (SBP) at 110 mmHg or;
2. Hypotensive, no initial bolus but aliquots maintain a SBP of 80 mmHg.

Primary endpoints: survival to 8 h. All surviving animals were killed by overdose of anaesthetic.

Group (n)	Group 1 (8)	Group 2 (6)	Group 3 (8)	Group 4 (6)
Blast/sham	Sham	Blast	Sham	Blast
Resuscitation	Normotensive	Normotensive	Hypotensive	Hypotensive
No surviving to 8 h/total	8/8	4/6	5/8	0/6
Mean survival time (95% CI) min	480 (all survived)	422 (313-531)	352 (210-494)	137 (94-181)
ABE ₁₈₀ mM (mean±SEM)	-6.7±3.8	-12.9±2.8	-14.4±2.1	-23.1±1.0
ABE ₄₈₀ mM (mean±SEM)	0.4±1.8	-5.4±2.2	-15.8±3.8	None surviving

ABE₁₈₀, ABE₄₈₀, Actual Base Excess of arterial blood 180 and 480 min after onset of resuscitation

Hypotensive resuscitation was associated with significantly reduced survival time compared to normotensive resuscitation ($P < 0.0001$ Peto log rank). This difference was present in the animals subjected to blast ($P = 0.0005$) but not in those given sham blast ($P = 0.06$). Both hypotensive resuscitation and blast injury caused significant metabolic acidosis (reduced ABE; $P < 0.05$, 2 way ANOVA). Blast injury exacerbated the acidosis caused by hypotensive resuscitation.

Prolonged hypotensive resuscitation is not compatible with survival after primary blast injury and leads to metabolic acidosis that is severely compounded by blast injury. The attending clinician will need to balance the risk of re-bleeding associated with normotensive resuscitation with the metabolic derangement associated with hypotensive resuscitation.

ELECTROLYTES, ORTHOPAEDICS AND ELDERLY CARE: HYPONATRAEMIA REVISITED

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Introduction

Electrolyte imbalance in the elderly is a clinical problem faced by both elderly care physicians and orthopaedic surgeons alike. The abnormalities in homeostatic mechanisms that manifest with age can have dramatic consequences for the unwary clinician. This study aims to establish the incidence of hyponatraemia within an orthopaedic population and to determine whether this is different to a control group of elderly care patients.

Methods

Retrospective, consecutive analysis of serum sodium levels of 200 patients (100 hip fracture patients and a control group of 100 elderly care patients). Serum sodium levels on admission and during the inpatient stay were recorded and analysed using student's t-tests to establish the incidence of hyponatraemia, changes in serum sodium level during admission and differences between the two groups.

Results

Hyponatraemia was evident in a third of all admissions (Orthopaedic: 29%; Elderly Care: 33%). The admission sodium level for both groups was not statistically different ($t(198) = 0.70$, $p = 0.49$). There was no significant difference in the observed hyponatraemia between the two populations throughout their care in hospital ($t(198) = 0.64$, $p = 0.52$).

Discussion

While there is a high incidence of hyponatraemia within the elderly population, there is no difference in its incidence between the aged orthopaedic population and the general elderly population. This is seen on admission and is also shown to be independent of operative procedures and fluid management as in-patients. Clinicians must be aware of the innocuous symptoms that may herald the catastrophic and avoidable consequences of this condition.

Effectiveness of hypertonic saline dextran for fluid resuscitation

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The use of small volumes of hypertonic solutions for hypotensive resuscitation has been suggested to improve outcome and confer significant logistic advantages. The supporting evidence is derived from studies with short delays from injury to definitive hospital care, but recent military experiences in Afghanistan and Iraq have described prolonged evacuation times of up to 24 hours. We compared the effects of hypotensive resuscitation with hypertonic saline dextran (HSD) against isotonic saline after haemorrhage with and without blast injury.

Terminally anaesthetised Large White pigs (48-65 kg) were allocated randomly to one of four groups and either exposed to a standardised blast load or sham blast followed in each case by a controlled haemorrhage (30% estimated blood volume). After a five-minute shock period, resuscitation was initiated according to one of two strategies to attain and maintain a systolic blood pressure of 80 mmHg:

1. 0.9% saline given as intermittent boli at 3 ml/kg/min;
2. 7.5% saline / 6% dextran 70 (HSD) given as intermittent boli of 0.71 ml/kg up to a maximum volume of 7.1 ml/kg (equivalent to 500 ml in a 70 kg subject), and thereafter given 0.9% saline.

The primary endpoint was survival to 8 hours and all surviving animals were killed humanely.

Group (n)	Group 1 (8)	Group 2 (6)	Group 3 (6)	Group 4 (6)
Blast/sham	Sham	Blast	Sham	Blast
Resuscitation	0.9% saline	0.9% saline	HSD	HSD
No surviving to 8 h/total	5/8	0/6	4/6	0/6
Mean survival time (95% CI) min	352 (210-494)	137 (94-181)	356 (154-557)	97 (17-176)
ABE ₁₂₀ mM (mean±SEM)	-14.7±1.8	-20.0±1.2	-8.7±4.4	-18.3±0.3
ABE ₄₈₀ mM (mean±SEM)	-15.8±3.8	None surviving	-2.3±3.1	None surviving

ABE₁₂₀, ABE₄₈₀, Actual Base Excess of arterial blood 120 and 480 min after onset of resuscitation

Choice of resuscitation fluid had no significant effect on survival time ($P=0.72$ Log-rank Peto, 0.9% saline vs HSD). However ABE was significantly higher (less negative, $P=0.031$ ANOVA) in animals treated with HSD compared to saline. This difference was present in the sham blast groups, but not in those subjected to blast.

These data indicate that HSD may have significant advantage compared to 0.9% saline for prolonged resuscitation of 'simple' haemorrhagic shock since it is associated with a reduced metabolic acidosis. Although the physiological benefits of HSD are not reflected in improved survival they may result in less physiological compromise in patients who would therefore be better able to withstand later surgical intervention. These effects were not seen after blast injury possibly because the degree of compromise was too severe to be overcome by any beneficial effects of HSD.

MEETING THE INFORMATIONAL NEEDS OF PATIENTS WITH ILIZAROV FRAMES

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Introduction: Ilizarov frames are widely used as an external fixation system. Whether applied for trauma, bone transport or deformity-correction they are usually applied for a minimum of three months and can be used for over a year. The psychological and lifestyle impact of frames has been shown to be significant.

Purpose: We examined the informational needs of patients with Ilizarov frames pre and post-operatively. We then assessed how these needs are met by the provision of a nurse-led support group.

Methods: All patients with Ilizarov frames applied at Hope Hospital, Manchester were contacted by postal questionnaire. Questions were asked about preparation before surgery, changes to lifestyle and information received. Specific questions were asked about attendance at the nurse-led Ilizarov support group.

Results: Thirty-seven patients replied. Twenty-two had frames on and fifteen had recently had them removed. Most patients reported feeling well prepared before surgery regarding the likely impact on their lives. Two-thirds (twenty-five) felt they had received adequate information. Three-quarters (twenty-six) patients had attended the Ilizarov support group and most (twenty-one) had attended the group pre-operatively. Over three-quarters of patients agreed they would attend the group with a "frame problem" before attending their own GP. All patients found the group supportive and felt comfortable discussing their problems.

Conclusion: The Ilizarov Support Group is a useful resource for people with frames. The group atmosphere is supportive to patients and it is a valuable problem-solving environment. It helps patients prepare for their surgery and reduces attendance to primary care providers for frame related problems. We suggest other Ilizarov units may benefit from the provision of such a service.

The control of haemorrhage with recombinant activated factor VII (rFVIIa)

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Haemorrhage is the leading cause of battlefield deaths and the second leading cause of early death in civilian trauma. A recent prospective randomised clinical trial concluded that intravenous administration of rFVIIa, a clotting factor, was safe and reduced blood loss in trauma victims [1]. However, evidence is lacking to show that rFVIIa increases survival after uncontrolled haemorrhage and shock. The aim of the current study was to determine whether rFVIIa, in combination with hypotensive (BATLS-type) fluid resuscitation could increase survival time when administered after severe haemorrhagic shock.

A prospective randomised controlled trial was conducted in 15 terminally anaesthetised (alphadolone/alphaxolone) Large White pigs (42-47 kg body weight). All animals were splenectomised, the bladder cannulated and a steel wire placed in the infra-renal aorta via a laparotomy and the abdomen closed in a watertight manner. All animals were given a controlled haemorrhage of 30% total estimated blood volume via a femoral arterial cannula followed by a 4-5 mm aortotomy using the pre-implanted steel wire to allow uncontrolled incompressible blood loss. After a 5 min shock period the animals were either given rFVIIa ($180 \mu\text{g}\cdot\text{kg}^{-1}$ i.v., $n=9$) or an equivalent volume of saline (placebo, $0.3 \text{ ml}\cdot\text{kg}^{-1}$ i.v., $n=6$). Fluid resuscitation was then commenced with Hartmann's solution ($3 \text{ ml}\cdot\text{kg}^{-1}\cdot\text{min}^{-1}$) until a systolic arterial blood pressure (SBP) of 80 mmHg was attained. Fluid infusion was then stopped and additional boli subsequently given at the same rate to maintain a SBP of 80 mmHg. The primary endpoint of the study was survival time to a maximum of 6 h after the onset of resuscitation. All surviving animals were killed humanely with an overdose of anaesthetic. A value of $P<0.05$ was considered statistically significant.

Survival time was significantly longer in animals given rFVIIa compared to placebo (131[31-207] vs 32[25-39] min respectively, median[95% confidence interval]) ($P=0.046$, Peto's log rank test). A significantly greater number of animals survived to 2 h after the onset of resuscitation in the rFVIIa group (5/9 animals) compared to those given placebo (0/6) ($P=0.042$, Fisher's exact test, one tailed). The target SBP was attained at least transiently in 7/9 rFVIIa treated animals while it was only attained in 2/6 given placebo ($P=0.12$, Fisher's exact test, one tailed). There was a trend towards a reduced volume of uncontrolled haemorrhage in animals given rFVIIa compared to placebo (free intra-abdominal fluid volume, normalised for survival time, 12[3.7-64.9] vs 60.3[41.1-69.8] $\text{ml}\cdot\text{min}^{-1}$, median[interquartile range]), although this did not attain statistical significance ($P=0.11$, Mann-Whitney U test, one tailed).

These results indicate that rFVIIa can produce an increase in survival time that is both clinically and statistically significant in a severe model of incompressible haemorrhage. rFVIIa was also associated with a trend towards better attainment of the target blood pressure and reduced blood loss during resuscitation.

PICTURE ARCHIVING AND COMMUNICATIONS SYSTEM (PACS) MEASURING FACILITY – AN UNRELIABLE TOOL IN ORTHOPAEDIC SURGERY

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Background

The measurement facility on PACS is used to aid decision making. This facility is inaccurate and does not reflect clinical parameters, rendering its use ineffectual. Previous works utilised only a single prostheses type, were under-powered and not statistically robust.

Aim

To establish and statistically analyse the reliability of PACS software for the measurement of orthopaedic parameters at a university teaching hospital.

Methods

Retrospective analysis of radiographs of 100 patients (50 hip hemi-arthroplasty, 50 intra-medullary nailing) was performed to provide a wide base and allow a comparison of the spherical implant and a nail.

Implant sizing from theatre records was compared with the post-operative films. The size of the implant on radiograph, the magnification of the exposure and the effect of further magnification was noted. Analysis of the results was by paired student's t testing incorporating inter-observer error into the test statistic.

Results

The hip prostheses were found to be oversized (range: 7-16mm; mean: 10.9mm). This is highly significant ($p < 0.01$). The nails were similarly oversized (range: 0-6mm; mean: 1.87mm). This result was significant ($p < 0.05$) although the error was less than for the spherical prosthesis. This is presumed due to the nature of the implant size and the distance of the implant from the cassette during exposure.

Discussion

This study demonstrates with statistical significance the unreliability of PACS measurement software. The manufacturer was contacted and has confirmed that accurate imaging can only be obtained on a named case, calibrated image. This has implications for all orthopaedic surgeons.

HOW RETROSPECTIVE ARE OUR LITERATURE SEARCHES?

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Abstract

Literature searches are commonly performed by medical professionals when carrying out research and during study of a particular topic. Traditionally this was performed manually in a library using a system called index medicus, developed in the early years of the 20th century, and was an arduous task. Over recent years, this has commonly been performed online using electronic search engines, which has drastically reduced the difficulty and time involved in performing a thorough literature search.

Electronic versions of index medicus began in 1964 and were termed MEDLARS. Medline was developed soon after and for many years available on CD-ROM within libraries. In 1997, PUBMED became free to all online, incorporating Medline. (1) Use of online electronic search engines has increased enormously over recent years. In 1996 7 million searches were performed per annum, increasing to 400 million searches per annum in 2001. (1)

The researcher has the ability online to identify articles dating back to 1966, some 39 years of published research and articles to digest.

We performed a retrospective study of 100 medical professionals in a busy district general hospital in the UK with the purpose of identifying how retrospective many of the searches were.

Results showed only 29% of subjects researched papers more than 15 years old, with 65% of subjects only looking at papers 10 years old or younger.

Our study shows that many researchers are now ignoring articles beyond a certain age, and as a result much important research is being largely ignored and possibly repeated.