

## MEETINGS AND ABSTRACTS

### THE 2007 TRISERVICE SURGICAL MEETING

The annual Triservice Surgical meeting was held this year on 23/24 March at the Defence Medical Services Training Centre, Keogh Barracks. The meeting was organised by Lt Col Bowley and Surg Lt Cdr Stannard and was well attended by over 70 delegates who heard excellent presentations on a variety of topics including many presentations of trauma data from both Iraq and nearer home in UK. There was also a stimulating poster competition. The whole conference was delighted to be able to listen to the keynote address from Professor Yoram Kluger of the Rambam Medical Centre, Israel. The Military Surgical Society once again kindly provided the prizes for the oral and poster presentation sessions. The oral competition was won by Maj Tom König for his talk on heterotopic ossification after the London bombings of July 2005 and Capt (now Maj) DS Scott was successful in the poster competition. The five best oral presentations are published below and the remainder published on the Journal website.

#### Heterotopic ossification in traumatic limb amputation after terrorist bomb blast. A series of cases from the London bombings of 7th July 2005.

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The terrorist bombings on the public transport system in London on the 7th July 2005 resulted in 55 deaths and many more injured. The effects of the blasts caused a variety of injuries, some more commonly seen as a result of military conflict. Some victims suffered traumatic amputations and required surgery to complete the amputation and debride affected tissue before later delayed primary closure. All 5 patients who suffered traumatic amputation and were treated at the Royal London Hospital (RLH) went on to develop heterotopic ossification (HO) in their amputation stumps. In two patients HO was seen bilaterally; one who suffered bilateral above knee amputations and the other bilateral below knee amputations who required re-operation to treat HO specifically. One above knee amputee developed HO and another, a below knee amputee developed asymptomatic mild HO. Another patient who suffered an above elbow amputation developed HO much later and may require revision at a later date. The complications of HO include stump pain and deformity which make prosthetic limb fitting and tolerance difficult and thus have implications for mobility. Heterotopic ossification is a disorder characterized by bone growth in soft tissues that have no ossification properties and typically occurs after central nervous system insults, traumatic surgical insults and thermal burns. The pathophysiology of HO remains unclear but theories proposed include inflammatory factors derived from denervated tissues, disrupted calcium homeostasis, microtrauma, hyperthermia, hypoxia and vascular stasis. All of which occur in traumatic blast amputation. It is commonly seen after closed head injury, spinal cord injury, and thermal burns but has also been described with neuromuscular blockade, trauma, acute poliomyelitis, and encephalitis. Treatment of heterotopic ossification is difficult and includes the use of bisphosphonates, non-steroidal anti-inflammatory agents, prophylactic irradiation, and surgical excision. Reports of HO in adults are rare but reports in the press about amputees in the US military who suffered their injuries in the recent conflicts in the Middle East have put the rate of HO at approximately 40%. We discuss the nature of the injuries,

surgery undertaken and post operative course and treatment of the patients who had amputations at the RLH after suffering injuries as a result of the terrorist bombings of the 7th July 2005 and who went on to develop HO.

#### Development of a large animal model for the investigation of a novel hybrid resuscitation strategy following blast and haemorrhage

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**Background:** Blast injuries and blood loss are significant problems in military casualties. Currently resuscitation is to a hypotensive endpoint to reduce the risk of re-bleeding, but this has only been validated for short resuscitation periods. A physiological study indicated that prolonged hypotensive resuscitation after blast and haemorrhage results in high mortality, which may be a problem with delayed evacuation. A novel hybrid strategy has been proposed involving initial hypotensive resuscitation followed by additional fluid to restore normotension after the first hour. **Aim:** To develop a model that includes blast injury, substantial blood loss and the capacity for uncontrolled bleeding to assess new resuscitation strategies. **Methods:** Large White pigs were terminally anaesthetised, splenectomised and instrumented for cardiovascular monitoring. Animals were subjected to blast (n=8) followed by a controlled haemorrhage of 30% blood volume (BV) and induction of a Grade IV liver injury. One of the blast animals received a controlled haemorrhage of 1% BV before the liver injury. **Results:** Grade IV liver injury following minimal pre-haemorrhage resulted in an intra-abdominal blood loss of 39% BV. In the remaining animals controlled haemorrhage and liver injury led to a fall in mean arterial blood pressure from 124±6 to 39±4 mmHg (mean±sem), and no recovery during a subsequent 5 min shock phase. Five animals were resuscitated to a target systolic blood pressure (SBP) of 80 mmHg with 0.9% saline. Intra-abdominal fluid loss was found to be 6±1% BV, in addition to the 30% BV removed during the controlled haemorrhage. In one further animal resuscitated to a target SBP of 110 mmHg 9% BV was found intra-abdominally. In all animals a robust clot was found adherent to the cut surface of the liver. Survival in one additional animal not resuscitated was 30 min.

**Conclusions:** A model of injury that requires resuscitation for survival has been developed. The liver injury can result in significant blood loss. It is relatively small after controlled haemorrhage because clot formation is facilitated by the low blood pressure and reflects the situation in a casualty where a clot will form after blood pressure has fallen.

## Fit for role? A retrospective cohort study of surgical SHO training in a ministry of defence hospital unit and on Operation Telic, Iraq

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**Aims:** Considerable amounts of research have documented the decline in emergency and elective opportunities for surgical trainees in the UK. This study aims to critically compare the surgical experience available over a year long period at the BMH Shaibah compared with that at MDHU FPH. **Methods:** Theatre records and personal paper and electronic log books were examined for both cohorts for the year. All operations were recorded (general surgery and orthopaedic; emergency vs elective). The level of involvement was analyzed according to the 1-4 criteria found in the RCS log-book. General surgical and orthopaedic opportunities were directly compared between the Op Telic and MDHU FPH cohorts. **Results:** 678 operations were analyzed between the two cohort groups over the year long period. The Op Telic data (numbers and percentages of emergency operations in brackets) yielded 119 general surgical operations (n=33; 28%) and 161 orthopaedic procedures (n=57; 35%). The MDHU FPH data yielded 188 general surgical operations (n=28; 15%) and 210 orthopaedic procedures (n=35; 17%). Wound debridement opportunities are considerable in Iraq and significantly better than in the UK. Appendectomy, I&D of abscesses and pilonidal sinus operations are as likely to be experienced on Op Telic as they are under current EWTD conditions in the UK. In all procedures the trainee in Iraq was more likely to learn to operate himself rather than acting as first assistant. **Conclusions:** The EWTD has severely affected junior surgical trainee's options for operating experience. Surgical training in Iraq provides a variety of significant opportunities not available in the UK both in terms of emergency and elective operating and should be recognized for surgical training as part of a military BST / ST programme.

## Hostile action casualties: a British military field hospital experience in southern Iraq.

**A Ramasamy, SE Harrisson, MPM Stewart**

**Background:** Since the end of major combat operations in Iraq in April 2003, British and coalition forces deployed in Southern Iraq have been opposed by a guerrilla-type insurgency. We report on the profile of casualties of hostile action seen in this type of conflict and how they compare with those reported in recent conventional wars. **Methods:** Data was collected on all casualties of hostile action who presented to the British Military Field Hospital Shaibah, Iraq from January to October 2006. The mechanism of injury, morbidity and mortality, duration of any

operative procedure and early outcome were noted. **Results:** During the study period there were 104 casualties of Hostile Action: Eighteen (17.3%) were pulse-less on arrival; 3 (2.9%) subsequently died of wounds. Forty-six (44.2%) underwent 114 operative procedures; the mean duration of operation per casualty injured in hostile action was 200.3 minutes; 33 (31.7%) sustained only minor soft tissue wounds and were returned to duty. An Improvised Explosive Device was used in 23 (38%) incidents and accounted for 12 (57%) deaths and 41 (49%) wounded. The mean number of casualties per incident was 1.73 (range 1.0 – 5.0). **Conclusions:** The profile of hostile action in the Iraqi insurgency differs from that of conventional warfare. An improvised explosive device is currently the leading cause of hostile action injury and death. This paper highlights the requirement for further research into the optimal management of injuries from this form of weapon.

## The outcome of boys referred with undescended testes

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**Aims:** To establish the management of boys referred with undescended testes to a single general surgical consultant with a declared interest in general paediatric surgery. **Methods:** Consecutive boys referred to a paediatric general surgical outpatient clinic with undescended testis during a period of four years were included. The outpatient diagnosis and management was recorded. **Results:** 347 boys were referred with undescended testis, median age 2 years 6 months (range 1 month – 15 years 9 months). Both testes were found to be in the scrotum at the outpatient consultation in 219 (63.1%) boys, median age 2 years 4 months (range 4 months – 15 years 4 months). 111 boys (32.0%) underwent surgical procedures, median age 4 years 3 months (range 4 months – 15 years 4 months); 89 (25.6%) unilateral orchidopexy, 18 (5.2%) bilateral inguinal orchidopexy. **Conclusion:** A higher percentage of older boys referred with undescended testes required orchidopexy.