Multiple casualties in the Bastion UK Role 3 hospital: personal reflections on the positive evolution of deployed military hospital care

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Abstract

In this article a snapshot of casualty presentations to the UK Role 3 hospital in Camp Bastion, Afghanistan, will be briefly described. The observations allow reflection on the advances and strength of clinical provision at the time of the incident, written from a medical command perspective.

Introduction

This account was written at the end of 2011, as 3 Commando Brigade Royal Marines returned from HERRICK 14 at the end of the last major Royal Navy led rolement in the Afghanistan campaign. The purpose of this paper is to characterise what was then a ‘high water mark’ of deployed medical provision with a view to informing future medical deployments on return to contingency operations. The care provided has continued to improve in the interim and the successful management of these patients was built on improvements made by preceding medical teams. It is entirely conceivable that in future conflicts the Defence Medical Services (DMS) will struggle to recreate the established and outstanding levels of deployed hospital care which may represent the pinnacle of operational medical care. Importantly, after ten years, both the British public, and those in harm’s way, have had their expectation of what can be achieved raised to a very high level.

The deployed hospital in Camp Bastion, Afghanistan, known as the Bastion (BSN) Role 3 (UK), has evolved extensively from its origins as a tented Role 2 (Enhanced) field hospital in 2005. This process has been complex and largely iterative, developing in response to new requirements and, sometimes, competing demands. The original UK force that deployed to Helmand Province in 2005 doubled in size to approximately 9,500 by 2011 and was further augmented by a US surge of 30,000 troops, collectively operating as the NATO International Stabilisation and Assistance Force (ISAF).

Many different individuals and teams from all three Services have contributed to the evolution of the Bastion Role 3 (UK), including clinicians, administrators and medical planners. Some early decisions have reaped unimagined dividends and the courage to prosecute expensive and difficult options should be recognised and lauded. Principal among these was the early decision to construct a tier 2, Role 3 facility, equipped with 64-slice Computerised Tomography (CT) scanners, which was occupied in 2007. Building work continued as late as November 2011 as the hospital expanded yet again to meet evolving requirements. The early stages of construction are shown in Figure 1.

Figure 1: The Bastion (UK) Role 3 Hospital under construction, November 2006

The Bastion R3 (UK) has effectively become a multinational Medical Unit, hosting a large contingent of US medical staff as well as Danes and Estonians throughout HERRICK 14 (H14) and other cycles. Critically, all H14 personnel attended mandatory UK pre-deployment training in the Army Medical Services’ hospital simulator to ensure they were fully integrated and indoctrinated in UK practices.
Multiple Casualty Incident

Background

One of the authors, in the role of Commander Medical, visited the Bastion Role 3 (UK) one evening in early July 2011. The hospital was relatively lightly occupied with four patients on the 14-bed Intensive Treatment Unit (ITU) and eight patients on the 35-bed Intermediate Care Ward (ICW).

This report deals with observations made when four critically injured patients were admitted to the facility between 19:37 hours and 21:45 hours on this date.

Casualties

The patients, all of whom were conflict-related battle casualties, presented as follows:

19:37 hrs - Patient 1
Afghan National Security Forces (ANSF) soldier aged 23. Victim of an improvised explosive device (IED) resulting in bilateral traumatic lower limb amputations (through knee on the right, above knee on the left), plus a blast injury to one arm.

Outcome - On admission to the Emergency Department (ED) Patient 1 was stable due to the use of Combat Applied Tourniquets and bandaging in the field. He underwent a whole body, contrast enhanced CT scan before proceeding to theatre for debridement of wounds and admission to ITU. Proximal vascular control was not required, as confirmed by the CT scan, and there was no genital involvement. The patient received 20 units of packed red blood cells (PRBC), 18 units of fresh frozen plasma (FFP), 5 units of platelets and 4 of cryoprecipitate. The latter requirement was determined by point of care dynamic clotting studies using rotational thromboelastometry (ROTEM). Following further elective second-look surgery he was transferred to the Afghan National Army (ANA) hospital at Camp Hero in Kandahar at day three after admission.

19:58 hrs - Patient 2
ANSF soldier aged 30. Gun shot wound (GSW) traversing the lumbar region and abdomen with injuries to the spine and spinal cord, both kidneys and colon.

Outcome - Patient 2 underwent a Focused Assessment with Sonography in Trauma (FAST) ultrasound scan in the ED, which showed free abdominal fluid. A CT scan confirmed the extensive damage, caused by a ballistic round, to both kidneys, the descending colon and disruption of the spinal column. The patient underwent a laparotomy and partial colectomy, followed by exploration of wounds, irrigation and dressings. The bowel was not exteriorised at this time. Postoperatively he was transferred to ITU. Following further elective surgery the day after admission, including the formation of an end colostomy, he was transferred to the ANA hospital at Camp Hero on the second day after admission.

20:09 hrs - Patient 3
ANSF soldier, age unknown. IED victim. Multiple injuries from fragments to the head, thorax, abdomen and right leg (fractured).

Outcome - Patient 3 had a large fragment wound to the right iliac fossa and, while undergoing assessment in ED, he de-stabilised and arrested, requiring external cardiac massage. He was immediately taken to theatre where a left thoracotomy and thoracic aortic cross clamping was performed urgently. An emergency laparotomy was then performed allowing cross-clamping of the abdominal aorta, which stabilised the patient. Thereafter, once haemorrhage from the intestinal mesentery had been controlled, a small bowel resection was performed. The ED staff who had been involved in the initial resuscitation continued to operate the rapid fluid infusers in the operating theatre (OT), assisting the anaesthetist. Following surgery, and resuscitation with mixed blood products, the patient underwent CT scanning followed by a return to OT for closure of the surgical wounds and external fixation of the right leg fractures. Thereafter the patient was managed on ITU for two weeks prior to transfer to the ANA system during which time he required parenteral nutrition. During the resuscitation phase he received 35 units of PRBC, 31 units of FFP, 4 units of platelets and 5 of cryoprecipitate.

21:47 hrs - Patient 4
ANSF soldier, age unknown. GSW abdomen.

Outcome - Patient 4 was stable on admission and therefore underwent a total body contrast enhanced CT scan before proceeding to the OT for an emergency laparotomy and partial colectomy followed by ITU admission. Following further surgery on the day after admission he was transferred to Camp Hero at day two after admission.

A fifth patient, an Afghan civilian, was admitted at 19:59 with a GSW to his right hand. He underwent surgery the following day and was discharged two days after admission. His care is not described further.

Discussion

All four patients survived their very severe injuries and the patient who suffered cardiac arrest had no evidence of sequelae resulting from cerebral anoxia. It is considered that if any one of these patients had presented to a UK district general hospital, they would have posed a significant clinical challenge to the facility. It is possible that had all four presented sequentially and nearly simultaneously to a
single UK facility, it might well have been overwhelmed and quite possibly unable to ensure the survival of all the patients.

Throughout the period when these four patients were being resuscitated and operated upon, the BSN Role 3 (UK) hospital remained open and able to accept further battle casualties. For a short period all four operating tables were simultaneously occupied but this occurred only briefly. The regional command centre was informed and could have diverted further casualties to an alternative facility had this been necessary.

The staff from ED, OT, X-Ray, Laboratory and ITU were well practiced at working seamlessly to deal effectively with each patient. Apart from the trauma teams, no additional staff were called into the hospital, and indeed a much-needed and long-planned social event for off-watch staff was able to continue unhindered. The off-going ED watch remained on duty to assist and the ED remained capable of receiving further casualties. Throughout the reporting period ED staff followed their patients into OT and assisted in their ongoing care. In turn they were supported by ITU staff who also came into OT to support the surgical teams. The ITU unit accepted all the casualties but remained capable of accepting further admissions and continued to provide high quality care to existing patients.

The surgical teams worked together in a way that is unusual in UK hospitals. All four operating tables are in a single large operating theatre, so the teams were able to see exactly what was happening and to communicate easily. Patient 1 was operated on by a UK and US orthopaedic surgeon and a UK plastic surgeon, Patient 2 by a UK general/vascular surgeon, Patient 3 by a UK and US surgeon, both generalists, and Patient 4 by an Estonian surgeon.

The pathology laboratory holds large stocks of blood and blood products (based on historical requirements) and was easily able to meet the demands of the clinical teams. Blood products have been used with increasing precision as the nuances of the near patient ROTEM capability are being understood (1). The facility is adept at performing massive blood transfusions, following an approved clinical protocol; some patients have required in excess of 200 units of blood and blood products to ensure their survival (2).

Sequencing of patient care is a key function undertaken by the Deployed Medical Director (DMD) and the Senior Nursing Officer (SNO), who co-ordinate and control the flow of patients through various departments in the hospital. Between them they ensure that every department is kept aware of what patients to expect, their likely requirements and the timescale for their arrival in each department. The delivery of care in the hospital is Consultant-led with the DMD able to provide immediate advice and guidance. The DMD is regularly involved in making potentially controversial decisions including ethical dilemmas relating to which patients can be treated and when and how to transfer Afghan patients to local facilities, conscious always that the follow-on care could be of an inferior standard.

Why was this episode so successful and what lessons do we draw?

The delivery of this level of care on operations is probably unprecedented in previous conflicts and is more remarkable when one considers the extended logistic lines of communication from the UK to Afghanistan.

Pre-deployment training has developed as the result of continuous feedback from theatre and a healthy culture of continuous improvement in the DMS has ensured that every significant lesson is identified and acted upon. Unit wide pre-deployment medical training is conducted by 2 Medical Brigade and all deploying staff undergo realistic training and testing, using real scenarios, in a full size replica of the BSN Role 3 (UK). Surgical teams are trained, using cadaveric material, by recently returned personnel on the Military Operational Surgical Training (MOST) course, run in conjunction with the Royal College of Surgeons of England. Team training and cohesion is essential to ensure that all staff members are aware of their roles and responsibilities; this is co-ordinated and delivered by the Army Medical Service’s specialist training organisation. A thorough review process supports continuous adjustment and improvement in the light of lessons identified.

It is likely that improved resuscitation has been one of the key factors in improved clinical outcomes (1, 3, 4). BSN Role 3 (UK) is able to harvest platelets from a pre-screened donor panel using apheresis, necessary from time to time due to the very short shelf life of platelets. Fresh whole blood can similarly be drawn from a donor panel if required. Baseline stocks of blood product are transported from the UK.

The design of the hospital was based around the delivery of trauma services and although the original footprint was still undergoing modification and indeed expansion in 2011, the facility is ideally suited to meet its primary function. The emphasis is clearly on the care of battle casualties, but many other types of patients are seen including medical emergencies, domestic accidents and road traffic incident victims. Not all the patients are military, and a variety of civilian patients, either entitled contractors or local nationals, are treated.

There is a vital need to ensure that the hospital is always able to “clear its back door”. In other words the BSN Role 3 (UK) must be able to discharge patients as rapidly as
possible to ensure it is always able to support the deployed fighting force. If the hospital was unable to accept casualties, commanders would be reluctant to allow troops to conduct combat or high risk operations. ISAF patients are rapidly returned to their home country using highly specialised Critical Care Support or Aeromedical Evacuation teams from either the Royal Air Force or the US Air Force. Most seriously injured ISAF patients are transferred out of theatre within 24 hours back to Role 4 hospitals in Europe. In the past there have been significant delays in transferring Afghan patients to either the military or civilian medical systems, but improving relations and developing ANSF capability have significantly improved this aspect of care.

Sitting above all the clinical activity is a governance system designed to ensure that all clinical activity is delivered safely, to recognised standards. It also promotes learning following errors, and recognises and responds to deviations from accepted outcomes. An active audit programme informs the decisions of the DMD, while risk management allows the deployed team to communicate their requirements to the Permanent Joint Headquarters who respond with alacrity and energy to meet the needs of the clinical staff.

Ultimately it is the staff of the UK Defence Medical Services and the US Navy who have created such a successful deployed hospital during Herrick 14, building on the success of their predecessors and strengthening the foundations for their successors. The UK personnel have shown that all three Services have capable and dedicated personnel who bring a very impressive array of talents to this theatre of operations. This ability to operate together bodes well for an uncertain future in which co-operation will be a key element, emphasising our common ethos and minimising any perceived differences.

Can the NHS Learn Anything?
Many of the staff deployed to the BSN Role 3 (UK) work in NHS facilities when not deployed operationally and they bring their experiences back to their parent hospitals. Clearly much of the success of the BSN Role 3 revolves around staffing and resources. These are finely balanced against the need, based on casualty estimates and constant reviews of the requirement. There is inevitably a political dimension in that successive Governments have committed to provide the best possible care for wounded service personnel (The Armed Forces Covenant) as part of the Moral Component of Fighting Power. Equally, it is clear that the NHS does not need to support such a specialised facility to deliver dedicated trauma care to a civil population. It is also apparent that the success of BSN Role 3 derives from the sum of its parts, rather than individual efforts, and that medical leadership plays a significant role in delivering this effect.

Resource allocation, competent, willing staff, effective logistics and specialist equipment are also vital to ensure success. The UK Role 3 layout has key departments in very close proximity and mobilising the staff required for each department takes minutes at most. The long logistic chain requires agile and proactive management of consumable resources.

Success in managing severely injured casualties also relies on concurrent clinical activity. Multiple surgical fields, with up to five surgeons and three anaesthetists working simultaneously on a single patient, is not something that commonly occurs in NHS hospitals but this happens regularly in the Bastion Role 3. A final lesson is that it pays to be realistic about what is being achieved at primary surgery for trauma cases. Securing haemorrhage, effective debridement and the use of topical negative pressure dressings on open wounds is recommended, with further surgery planned once the patient has stabilised (5).

Conclusion
The UK Role 3 hospital in Camp Bastion has provided outstanding care to the deployed force throughout the Herrick campaign, allowing commanders to deploy their forces according to the military objectives, rather than being constrained by the medical support available to them. The provision of medical support to operations in Afghanistan has set a benchmark against which future medical support to operations will be judged. We must ensure that, whatever uncertainties the future holds, we reach or exceed this benchmark.

References
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