Author's response to reviews

Title: Outcomes following liver trauma in equestrian accidents

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Author's response to reviews: see over
Reviewer's report #1

Title: Outcomes following liver trauma in equestrian accidents

Version: 1 Date: 16 March 2014

Reviewer: S Sudhindran

Reviewer's report:

The authors have a well defined aim of the study which is probably of limited interest but interesting and worth publishing. It is a retrospective review with its necessary limitations but such rare injuries can only be studies in similar fashion. The data is good enough.

The discussion is well balanced and so is the conclusion. The title and abstract too convey the gist of the paper. The writing is very good.

We thank the reviewer for their kind review and agree with their evaluation of the limitations mentioned above which are necessarily imposed by the rarity of injuries studied in this paper.

Reviewer's report #2

Title: Outcomes following liver trauma in equestrian accidents

Version: 1 Date: 29 March 2014

Reviewer: Jan BF Hulscher

Reviewer's report:

Major Compulsory Revisions

While this is a nice paper on liver injuries after equestrian accidents, there are a few major drawbacks which need to be assessed. The paper suffers from a few flaws which can not be repaired, such as the limited number of patients and the retrospective nature of the paper. I realize that these drawbacks are rather inevitable given the rarity of the injury described.

We thank the reviewer for their review and have addressed their concerns point-by-point below. All amendments to the manuscript have been highlighted in yellow.

First, it seems as if patients who were referred from other centers are also included in the case load. This induces a large bias: patients who have been admitted and stablized elsewhere (or even had surgery in another hospital one month prior to admission) can hardly be compared to patients admitted primarily to the shock room. This should be eludicated by adding information
about the time between the accident and admission, and preferably all referrals should be omitted - when numbers allow.

As our center is a regional tertiary referral center for hepatobiliary pathology including liver trauma, the majority of our patients in this series were referred from elsewhere, hence cannot be excluded from this series without significantly reducing the numbers of this study. Patients admitted to peripheral hospitals were resuscitated and imaged with either ultrasound scans, CT or both, then transferred to our unit for further observation or management. While the authors accept that the admission and initial management in peripheral units introduces an element of heterogeneity into the analysis, we would contend that this is inevitable given the centralization of hepatopancreaticobiliary services in the United Kingdom and is thus a reflection of the reality of liver trauma management in practice. In addition the process of centralization has provided regional units such as ours the benefit of experience of managing more patients with these injuries than would be seen in individual peripheral units. We have acknowledged this limitation in the discussion section of this paper.

Also, there is relatively little data on the severity of injuries sustained. All in all it seems most injuries are relatively minor. Providing a table including patient details such as concomitant injuries and ISS would provide more insight. This holds true as well for a more detailed description of the age of the patients: liver injury in children might need a slightly different management when compared to adult patients. How many patients were below 16 years of age?

We have added a new table (Table 3) to the results section of the manuscript, which provides information on the injuries experienced by each patient including Injury Severity Scores (ISS) based on Abbreviated Injury Scale (AIS) grading of liver injury in this group of patients. Only one patient in our study cohort was under the age of 16.

I find it rather disturbing that in this relatively young and hemodynamically stable population CT scans are performed so often, and ultrasonography is bypassed. This is not according to standard protocols, and certainly not according to the insights in pediatric patients. CT scan does have diagnostic yield, but often does not lead to a change in management, despite the high dose of radiation administered. This seems to be the case in the present series as well. This should be discussed, and the conclusion that CT imaging is advised should be omitted - as it certainly does not hold true for all patients, let alone for hemodynamically stable children with possible liver injury. Based on the authors data set one might also make the case that CT scan in hemodynamically stable does not add anything at all besides radiation risk...

While we accept the risk of radiation that CT poses to younger patients in particular, current evidence in the literature as well as Advanced Trauma Life Support® guidelines recommend CT to be better than ultrasound for parenchymal injury. In addition CT is less operator dependent than ultrasonography and is especially beneficial in haemodynamically stable patients as unstable patients with evidence of free intraabdominal fluid on
Focused Assessment with Sonography in Trauma (FAST) scans are candidates for urgent laparotomy. Our own experience of the value of CT scanning in abdominal pathology has shown that early CT assessment allows the detection of unexpected clinically significant primary and secondary diagnosis, thereby improving patient management. While the diagnostic sensitivity of ultrasound can be augmented with the use of contrast enhancement, ultrasound has still been found insufficient as first line investigation in the trauma patient but may be a useful modality in follow-up of abdominal injuries. We have amended the discussion section of the paper to answer this point and added relevant references to substantiate this.

Apparently embolization has not been performed in the present series, despite the suggestion of an arterial blush on CT scan. The indication for embolization might be the most important result from a CT scan in a hemodynamically stable patient, and probably the only result that actually changes management. Why did the authors not perform embolization in the patients with signs of active bleeding? What are the indications for embolization in their centre?

The patients in our study were admitted between 1995 and 2011, during which period there has been significant development in the accessibility and technical expertise of our interventional radiology and angiography service. Only one patient in our study had signs of contrast extravasation on CT scan. Indications for embolization in our unit include evidence of arterial extravasation on CT and haemodynamic instability or need for ongoing blood transfusions to maintain haemoglobin levels, or as adjunctive haemorrhage control in patients with controlled bleeding despite laparotomy. This patient remained haemodynamically stable throughout hence no embolization was attempted. This has been added to the results section of the manuscript.

The authors state that three patients were hemodynamically unstable upon admission. Two underwent surgery, but what happened to the third? This might also shed some light on the indication when to perform a CT scan.

The third patient with haemodynamic instability had not only liver injury but also lung contusions and bilateral haemothoraces which were managed by intercostal chest drainage. Haemodynamic stability was regained after transfusion of 4 units of packed red cells. No contrast extravasation was noted on CT hence no embolization was performed. The patient required 10 days of intensive care support and suffered no sequelae from the hepatic injury. This has been added to the results section of the manuscript.

An emergency hemihepatectomy is hardly ever necessary, and as the authors rightly state, associated with significant mortality. The authors should elaborate on the indication to perform an acute hemihepatectomy in 10% of their cases.

One patient had an emergency right hemihepatectomy at the peripheral hospital due to haemodynamic instability, prior to transfer to our unit. The second patient had haemodynamic instability unresponsive to resuscitation in
the context of severe liver trauma (AIS grade 5) and required an emergency laparotomy for haemorrhage control. We have elaborated on this in the results section of the manuscript.