

DAMIAN MCMAHON TRAUMA PAPER COMPETITION



SATURDAY 29 AUGUST 2020 - 10:00 am

By Virtual Webinar

Time	Presenter	Topic
10:00	John Crozier, Chair	Welcome, Introduction, Housekeeping
10:08	Nima Yaftian	<i>Surgical fixation of rib fractures - a 5-year single centre experience</i>
10:19	Katherine Grant	<i>Comparison of airflow in fenestrated versus non-fenestrated tracheostomy tube – a 3D printed bench model study</i>
10:30	Matthew McGuinness	<i>Nail guns: Not just an occupational hazard</i>
10:41	Jordan Hamilton	<i>VTE in Trauma: Experience at a Level 1 Trauma Service</i>
10:52	Matheesha Herath	<i>Managing renal trauma in the 21st century - A 15 year retrospective analysis of renal trauma in a tertiary South Australian referral centre</i>
11:03	Patwinder Gill	<i>Factors associated with short term complications following pancreatic and duodenal trauma</i>
11:14	BREAK 12 minutes	
11:26	Elizabeth LOCKIE	<i>Poor compliance with obstetric trauma imaging guidelines: is it time to re-evaluate the role of x-rays?</i>
11:37	Enoch WONG	<i>Use of the Canadian C Spine Rule in Blunt Trauma Significantly Reduces the Number of Cervical Spine Imaging Performed Whilst Maintaining Sensitivity</i>
11:48	Isaac Tranter-Entwistle	<i>What a headache! Reviewing concussion practice in a new trauma service</i>
11:59	Wen-Shen Lee	<i>Ocular trauma associated with falls in the elderly - a 10-year review from a state trauma service</i>
12:10	Angelika Na	<i>CT imaging for patients post-hanging incident</i>
12:21	BREAK 10 minutes Trauma specialist presentations	Judges confer off-line
12:31	John Crozier, Chair RACS Trauma Committee	Winner announced
12:34	Session Finishes	

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Judges

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Katherine Walsh, Manager, Victorian Regional Office

ABSTRACTS

SURGICAL FIXATION OF RIB FRACTURES - A 5-YEAR SINGLE CENTRE EXPERIENCE

NIMA YAFTIAN, ANNEISE COCCO, VIGNESH RATNARAJAM, YANG CHENG, NEIL GLASSFORD, KELLIE

GUMM AND PHILLIP ANTIPPA

Royal Melbourne Hospital, Victoria

Purpose

Surgical stabilisation of rib fractures (SSRF) is a procedure, which is gaining popularity due to growing evidence of its short and long-term benefits. Significant developments in this technique have occurred in recent years. This study examines the features and outcomes of patients having SSRF within the last six years.

Methodology

A retrospective review of all patients undergoing SSRF from January 2013 to December 2018 in our level 1 trauma service was performed. Demographic, injury and treatment data were extracted.

Results

136 patients underwent SSRF in this time period out of a total of 2517 major chest trauma patient. The median age of patients undergoing SSRF was 52 (IQR 41.5 – 63) years (range 18 to 89). Mean injury severity score (ISS) was 27.04 ± 13.02 .

Most patients were in ICU prior to SSRF (112/136, 82.35%). The indication for SSRF was flail chest in 66.18% (90/136) of patients.

The mean length of acute hospital stay was 21.83 ± 31.65 days. The 30-day in-hospital mortality rate was 2.21% (3/136). Discharge destinations were rehabilitation for 51.1% of patients (68/133), home for 35.3% of patients (47/133), and transfer to another healthcare facility for 13.5% of patients (18/133).

Conclusion

Despite being severely injured and often requiring pre-operative intensive care, patients who had SSRF had a low mortality rate. Most were discharged home or to rehabilitation following surgery.

Nail guns: Not just an occupational hazard

MATTHEW MCGUINNESS, SAMUEL HAYSOM AND IAN CIVIL

Auckland City Hospital, Auckland, New Zealand

Purpose

Nail guns are a ubiquitous tool in the building construction industry. Not only do they represent a workplace hazard, but in the presence of mental illness represent a significant threat to life. To determine the prevalence of nail gun injury and adequacy of safety features, a 25-year review of nail gun injured patients admitted to Auckland City Hospital (ACH) was undertaken.

Methodology

The ACH Trauma Registry was used and aspects pertinent to the circumstances of injury, nature of injury, treatment and outcome were evaluated. The relevant medical literature and NZ legislature were also reviewed to determine the safety expectations during the 25-year period.

Results

Between 1994 and 2019 45 patients were admitted to ACH with nail gun injuries. 31% (14) presented with self-inflicted injuries and 69% (31) presented with an unintentional workplace injury. All patients were male and the mean age was 36.3y. Patients presenting with self-harm had a higher ISS (24 vs 3), a higher fatality rate (3 vs 0), a higher ICU admission rate (50% vs 3%) and were less likely to be discharged home (21% vs 100%). All unintentional injuries occurred at a worksite. Apart from powder actuated nail guns, education was not required before use and there were no safety features that prevented non-workplace use.

Conclusion

This review revealed two disparate causes of nail gun injury with significant implications on injury severity and mortality. Although having many properties similar to projectile-firing weapons, safety features and legislation were less strict and allowed a steady occurrence of these injuries. Further education and training for workplace use and specific safety features to prevent use against the human body should be considered.

COMPARISON OF AIRFLOW IN FENESTRATED VERSUS NON-FENESTRATED TRACHEOSTOMY TUBE – A 3D PRINTED BENCH MODEL STUDY.

KATHERINE GRANT, LEE PRYOR, JOHN-CHARLES HODGE, MORGAN HUNTER, NICOLE LEONARDIS, LAUREN BUSSELL AND ANDREW FON
Royal Adelaide Hospital, SA

Purpose:

The aim of this study was to determine if there is a significant difference in airflow velocity between fenestrated and non-fenestrated tracheostomy tubes using a bench model.

Methods:

An anatomically and structurally accurate model trachea was created using 3D printing. Peak Expiratory Flow (PEF) through trachea model with no tracheostomy, non-fenestrated and fenestrated tracheostomy was measured at various flow rates using pneumatachometer. Four different flow rates, 25L/min, 50L/min, 100L/min, 150L/min were used. Airflow velocity through the trachea was compared using unpaired t-test for each flow rate. P value < 0.05 considered significant.

Results:

Mean PEF for trachea without tracheostomy was 0.80, 1.42, 2.85, 4.14 L/sec for each flow rate respectively. Trachea with non-fenestrated tracheostomy tube was 0.97, 1.46, 2.52, 3.96 L/sec respectively and trachea with fenestrated tracheostomy tube was 0.81, 1.45, 2.63, 4.11 L/sec respectively. PEF was significantly higher in the trachea with non-fenestrated and fenestrated tracheostomy tube compared to trachea without tracheostomy at airflow 100L/min (p = 0.001, 0.011 respectively). PEF was significantly higher in fenestrated tracheostomy tube compared to non-fenestrated tracheostomy tube at airflow 25L/min and 100L/min (p = 0.036, 0.030 respectively). There was nil significant difference in PEF between fenestrated and non-fenestrated tracheostomy tubes at 50L/min and 150L/min.

Conclusion:

Airflow velocity was significantly higher in fenestrated compared to non-fenestrated tracheostomy tubes at 25L/min and 100L/min. The difference in means between tracheostomy types was minimal and hence, despite these differences we hypothesise that they are unlikely to translate into any clinical significance.

VTE IN TRAUMA: EXPERIENCE AT A LEVEL 1 TRAUMA SERVICE

JORDAN HAMILTON, ANNELISE COCCO, KELLIE GUMM, ROSE SHAKERIAN AND BENJAMIN THOMSON
Royal Melbourne Hospital, Victoria

Purpose

Venous thrombo-embolism (VTE) is a major cause of preventable morbidity and mortality amongst major trauma patients. The existing data regarding VTE risk factors, prophylaxis and treatment comes from centres primarily dealing with penetrating trauma. This study aimed to discover the rates of VTE, risk factors, and treatments given in an Australian centre.

Methodology

A retrospective cohort study was performed of all major trauma patients diagnosed with VTE between 1/7/2010 and 30/6/2019 was performed. Cases of VTE were defined as the presence of deep venous thrombosis (DVT) or pulmonary embolus (PE) confirmed radiologically. Data relating to patient demographics, injuries and treatment were collected.

Results

From 8744 major trauma admissions there were 274 confirmed cases of VTE (3.13%). There were 174 cases of PE, 70 cases of DVT and an additional 30 cases of both DVT and PE. The median injury severity score (ISS) was 22 (IQR 16.3) and there were 23 inpatient mortalities (8.36%). Amongst VTE patients the average length of stay was 27.0 days (SD 25.4) and the average length of ICU stay was 8.38 days (SD 10.0). The most commonly associated injuries were rib fractures (n= 143, 52%), long bone fractures (n = 114, 41.5%) and intracranial haemorrhage (n = 110, 40%). Of the 275 VTE cases audited, 207 patients were treated with chemical anticoagulation (75.5%) and 52 IVC filters were inserted (19.0%).

Conclusion

VTE in trauma patients was associated with a high burden of injury and mortality rate. The rate of IVC filter insertion was higher than anticipated, and the indications for IVC filter placement in this group needs to be considered further.

MANAGING RENAL TRAUMA IN THE 21ST CENTURY - A 15 YEAR RETROSPECTIVE ANALYSIS OF RENAL TRAUMA IN A TERTIARY SOUTH AUSTRALIAN REFERRAL CENTRE

MATHEESHA HERATH AND RICK CATTERWELL

Royal Adelaide Hospital, SA

Purpose:

To analyse the demographics, mechanism, severity and management of patients presenting with blunt and penetrating renal trauma in a metropolitan level 1 trauma centre.

Methodology:

Retrospective de-identified data was collected of 365 patients through electronic record and case note review between 2002 to 2017. Severity of injury was categorised using the American Association for the Surgery of Trauma (AAST) grading system.

Results:

Over 15 years 365 patients were admitted in the Royal Adelaide Hospital with renal trauma. There was an 83% (n=302) male predominance. 95% (n=347) sustained blunt injuries and 5% (n=18) suffered penetrating trauma. Road traffic accidents contributed to 59% (n=208) of admissions. 15% (n=53) of injuries were sustained during sporting activities. Only 5 patients required nephrectomy (four patients with a Grade 5 injury, one with a Grade 4 injury). 2 patients, both with grade 5 injuries, were managed with a partial nephrectomy. Renal angiography was performed in 25 patients with 10 proceeding to embolisation. In this series 15% (n=56) of patients underwent laparotomy, the vast majority due to haemodynamic instability caused by other injury.

Conclusions:

This is the largest cohort of patients with renal trauma gathered in Australia. Road traffic accidents are the commonest cause of renal trauma with a predominance of blunt trauma. When there is no haemodynamic instability the vast majority patients with renal trauma can be successfully managed without any operative intervention.

FACTORS ASSOCIATED WITH SHORT TERM COMPLICATIONS FOLLOWING PANCREATIC AND DUODENAL TRAUMA

PATWINDER GILL, DANIEL MARASCIA, ANELISE COCCO, KELLY RUECKER, CHRISTINE LI, KELLIE

GUMM, BENJAMIN LOVEDAY, BRETT KNOWLES AND BENJAMIN THOMSON

Royal Melbourne Hospital, VIC

Background:

Pancreatic and duodenal trauma (PDT) are uncommon and can be associated with significant morbidity and mortality. This study aimed to identify factors associated with mortality and short-term outcomes of organ-specific complications following PDT.

Methods:

A retrospective cohort study was performed on all patients with PDT admitted to a Level 1 Trauma Service from 2000-2017. Data on patient demographic, injury scores, physiologic parameters and American Association of Trauma Surgery (AAST) PDT grades were extracted from the prospective trauma database. Outcomes were inpatient mortality and organ-specific complications (pancreatic fistula/pseudocyst/necrosis; duodenal fistula/stricture/anastomotic leak). Multivariate logistic regression was performed to identify factors associated with short term complications.

Results:

148 patients sustained PDT, of whom 95 (64.2%) had a complication. The inpatient mortality rate was 17/148 (11.5%). Grade IV PDT was the only PDT grade significantly associated with the development of pancreatic pseudocyst (OR 50.953, p=0.03). Other organs injured, ISS, presence of shock on arrival to hospital, or type of management undertaken (non-operative vs. operative) were not significantly associated with mortality or organ-specific complications.

Conclusion:

Pancreatic and duodenal injuries are associated with high morbidity and mortality rates. Grade IV pancreatic injury is associated with an increased risk of developing pancreatic pseudocyst compared to other grades of injury.

POOR COMPLIANCE WITH OBSTETRIC TRAUMA IMAGING GUIDELINES: IS IT TIME TO RE-EVALUATE THE ROLE OF X-RAYS?

ELIZABETH LOCKIE, KELLIE GUMM, ANITA SKANDARAJAH, DIANE PASCOE, BENJAMIN THOMSON AND ROSE SHAKERIAN

Royal Melbourne Hospital, Victoria

Purpose:

Trauma occurs in 8% of pregnancies and is the leading cause of non-obstetric fetal and maternal death. The principle of management of obstetric trauma patients is that they should be assessed as if non-pregnant, with the fetus being the second priority. As such, obstetric patients should receive imaging as per trauma guidelines, based on mechanism of injury and clinical status, as highlighted in the RMH pregnancy and trauma guidelines. A previous study at RMH showed compliance with guidelines is poor, and this study aims to re-assess compliance.

Methodology:

A retrospective review was conducted of the RMH Trauma Registry identifying all pregnant patients presenting to RMH emergency department from January 2015 until December 2018 following trauma. Demographic data, mechanism of injury, initial vital signs, and initial imaging completed in the emergency department was collated. This information was compared to the imaging guidelines for pregnant trauma patients.

Results:

The compliance with imaging guidelines was examined in 388 pregnant major trauma patients, of which 124 were involved in high-risk trauma. Of the high-risk group, imaging was performed in 80.6%, but complete in only 14.5% of patients. Over the four years, use of computer tomography (CT) of chest and abdomen/pelvis increased and use of pelvic and chest x-rays decreased.

Conclusions:

Compliance with imaging guidelines in obstetric trauma continues to be poor. The trend towards increased use of CT and decreased use of x-rays may reflect reasonable practice to exclude serious or occult injuries while minimising fetal radiation. Perhaps it is time to re-evaluate the role of x-rays in guidelines.

WHAT A HEADACHE! REVIEWING CONCUSSION PRACTICE IN A NEW TRAUMA SERVICE

ISAAC TRANTER-ENTWISTLE, MEL EVANS, CHRIS WAKEMAN, SIMON JOHN AND ANDREW MCCOMBIE

Christchurch Hospital, Canterbury, New Zealand

Purpose

Mild traumatic brain injury (mTBI) is a common, poorly managed condition with underestimated impact. Given the recent establishment of the Christchurch trauma service we reviewed our practice in terms of acute assessment and follow up.

Methodology

A single observer retrospective review of all patients presenting to Christchurch emergency department between 1/8/2019-30/9/2019 with ICD-10 coded diagnosis of head trauma was conducted. Patients younger than 16 or older than 80 years, with intercurrent medical illness, or not meeting diagnostic criteria for mTBI were excluded.

Results

A total of 240 out of 526 patients met inclusion criteria. Median age was 29 years (IQR 22-50), 65.4% (157 patients) were male. The most common mechanism of injury was falls 26.3% (63 patients) followed by assault 25.4% (61 patients). Most common recorded diagnosis was head injury 41.3% (99 patients) followed by concussion 34.2% (82 patients). Westmeade post traumatic amnesia (WPTAS) testing was documented for 4.2% (10 patients). Head injury advice was documented in 61.7% (148 patients) of patients. On discharge no follow up plan was documented for 63.8% (153 patients) of patients. ACC claims were documented for 192 patients, 13.5% (26 patients) received follow up.

Conclusion

The management of mTBI at Christchurch hospital needs improvement. Accurate diagnostic coding and appropriate referral allows patients to access funded clinics. This data suggests insufficient follow up, in keeping with the international literature. Furthermore, given the predictive nature of WPTAS for outcomes the low usage rate is concerning. This data suggests that a mTBI protocol is needed to standardise assessment, management and follow up.

OCULAR TRAUMA ASSOCIATED WITH FALLS IN THE ELDERLY - A 10-YEAR REVIEW FROM A STATE TRAUMA SERVICE

WEN-SHEN LEE, PHILOMENA MCNAMARA AND ROBIN MEUSEMANN

Alfred Health, VIC

Purpose:

Falls are the leading cause of injury-related emergency presentations, hospital admissions and deaths in Victorians over the age of 65. While there is extensive literature analysing traumatic injuries resulting from falls, there is little data on ocular injuries in this patient group.

Methodology:

A retrospective audit of all patients over 65 years referred to the Ophthalmology Department of a tertiary hospital following fall from standing height between January 2009 and December 2018 to determine the demographics, accident setting, ophthalmic injuries, interventions and outcomes of ocular trauma secondary to falls.

Results:

270 patients (F=155, M=115) were included, with a mean age of 81 years. 180 falls (66.7%) occurred in a residential environment. The most common reason for referral was orbital fracture (n=155). Severe ocular injuries included globe rupture (n=23), retro-bulbar haematoma (n=22), retinal detachment (n=6) and traumatic optic neuropathy (n=6). 40 patients (14.8%) presented with a visual acuity (VA) below 6/60 while 34 patients (12.5%) had a non-assessable VA secondary to delirium or intubation. Of these 34, 9 had a significant ocular injury. A total of 31 patients (11.5%) had a final VA worse than 6/60. 17 patients (6.3%) had injuries detected on secondary or tertiary survey, including one globe rupture and one case of traumatic optic neuropathy.

Conclusion:

Elderly falls may be associated with sight-threatening ocular injuries which are common and easy to miss in this population demographic. It is therefore essential for trauma practitioners to perform a detailed and systematic assessment in order to identify sight-threatening ocular injuries.

USE OF THE CANADIAN C SPINE RULE IN BLUNT TRAUMA SIGNIFICANTLY REDUCES THE NUMBER OF CERVICAL SPINE IMAGING PERFORMED WHILST MAINTAINING SENSITIVITY

ENOCH WONG, LAI WAN REID, MEREDITH SYMONS, JI YUE WANG, JOY FU AND PAUL BUNTINE

Eastern Health, Victoria

Introduction

The rate of significant cervical spine injuries in blunt trauma patients is low. However the use of imaging continues to increase resulting in many unnecessary scans and placing pressure on emergency, radiology and surgical trauma services. The Canadian C spine rule was developed as a decision rule for the use of cervical spine radiology in alert, stable trauma patients with the potential to decrease unnecessary imaging.

Methods

Since February 2019, a CT neck criteria algorithm based on the Canadian C spine rule (CCR) was applied for all blunt trauma patients presenting to our emergency department (a tertiary non trauma centre). Imaging was only considered for patients meeting the criteria. A prospectively maintained database of these patients was recorded including significant findings on cervical spine imaging. The algorithm's impact on number of CT cervical spines being performed was also assessed.

Results

Over 800 patients were analysed. There was an approximately 30% decrease in CT cervical spine imaging being performed in our centre. The rate of cervical spine injury was low (5%). There was 1 patient who had a delayed diagnosis of a cervical spine fracture after the cervical spine was cleared clinically. This patient met the criteria according to the Canadian C spine rule.

Conclusion

The use of a CT C spine algorithm has helped reduce the number of CT cervical spine imaging being performed whilst still being sensitive to detect any significant injuries. Further investigation is being undertaken to ensure the use of this algorithm does not miss injuries in our centre.

CT IMAGING FOR PATIENTS POST-HANGING

INCIDENT ANGELIKA NA, KATHLEEN MCDERMOTT AND

JODIE-KATE WILLIAMS *National Critical Care and Trauma Response*

Centre , Northern Territory

Background:

Hanging is one of the leading suicide methods worldwide. Recent controversies in the literature arise regarding the appropriate imaging for post-hanging patients. The overuse of CT cervical spine, angiogram of the neck and brain has been questioned.

Aims:

To analyse the frequency of CT cervical spine (CTC), angiogram of the neck (CTA) and CT brain (CTB) being performed in patients admitted to hospital post-hanging incidents. Secondary outcomes include type of injury, subsequent management and mortality.

Method:

Retrospective review of all patients admitted to Royal Darwin Hospital (2009-2018) post-hanging incidents. The Trauma Service Registry and Medical Record were searched by clinical coding for hanging or strangulation.

Results:

407 patients were admitted post-hanging incidents (age 12-73 years old, male 62%). 14% (n=59) of patients were admitted to ICU/HDU. Overall mortality rate was 6% (n=23). CTC was performed in 43% (n=177), CTA in 31% (n=126) and CTB in 38% (n=153) patients. There was no cervical spine injury found. For patients who underwent CTA, injuries were detected in 2% (n=3). One patient had left internal carotid artery dissection and died from stroke. Another patient had irregular carotid artery spasm. The last patient had a vertebral artery dissection requiring anticoagulation. CTB identified five patients with hypoxic injury.

Conclusion:

For patients admitted post-hanging incidents, the frequency of imaging use was 43% (CTC), 31% (CTA) neck and 38% (CTB). Although only 2% of CTA and 3% of CTB showed abnormality, given the potentially significant sequelae of any missed injuries, appropriate imaging should be clinically considered.