Civilian Penetrating Neck Trauma at a Level I Trauma Centre: A Six-Year Experience at the Queen Elizabeth Hospital Birmingham

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Introduction

Penetrating neck trauma (PNT) describes a penetrating neck injury that breaches platysma.⁽¹⁾ PNT is present in 5-10% of all trauma admissions⁽¹⁾, and mortality, most often due to exsanguinating haemorrhage, varies between 3-6%⁽²⁾. Worldwide, the most common mechanism of injury is stabbing from violent assault followed by gunshot wounds and deliberate self-harm.^(1,2) The management of PNT has evolved from a zonal to a “no zone” approach that is based on clinical signs of injury rather than wound location (see Table).⁽¹⁾

Soft Signs	Hard Signs
Venous ooze	Active haemorrhage
Non-expanding or non-pulsatile haematoma	Expanding or pulsatile haematoma
Dysphonia	Bruit or thrill in the area of injury
Dysphagia	Shock unresponsive to initial fluid resuscitation
Minor haemoptysis	Massive haemoptysis or haematemesis
Subcutaneous emphysema	Air bubbling through injury site

Aims

- To report the experience of civilian PNT at a UK Level I trauma centre, and compare this to best-evidenced practice⁽²⁾.
- To assess the degree of correlation between ‘hot’ imaging reports and consultant imaging reports.
- To assess the degree of correlation between clinical signs of injury and operative findings, and between imaging reports and operative findings.

Methods

Study design: Retrospective case note review

Inclusion criteria:

- Penetrating neck wound that breached platysma

Exclusion criteria:

- Penetrating neck wound sustained in warzone
- Blunt neck trauma

Potential cases between 01st January 2011 and 31st December 2017 identified by medical coding

2386 patient notes retrospectively assessed for inclusion

2168 cases excluded

218 civilian PNT cases included

155 data variables collected per case using Clinical Portal (A&E notes, imaging reports, operative reports, discharge letters, follow-up appointments)

Data analysis using IBM SPSS Statistics

Results

Incidence:

The number of PNT cases treated at the Queen Elizabeth Hospital Birmingham has quadrupled since it was given regional level I trauma status in 2012. The incidence is now approximately 40 cases a year.

Patient Demographics:

183 (83.9%) patients were male and 35 (16.1%) were female. The median age at admission was 38.1 years (range, 16.1 – 88.1 years).

Mechanism of Injury:

The most common mechanisms of injury were assault with a knife, and deliberate self-harm (DSH), accounting for 93 (43.5%) injuries each.

Clinical Signs of Injury:

On physical examination, 106 (49.5%) patients had no signs, 79 (36.9%) had soft signs, and 29 (13.6%) had hard signs of aerodigestive or vascular injury. Internal injuries were found during open exploration in 3 (2.8%) patients with no signs, 46 (67.6%) with soft signs, and 27 (93.1%) with hard signs.

Definitive Management:

160 (74.8%) patients underwent open exploration, whilst the remaining 54 (25.2%) had their wounds sutured in A&E. However, only 26.9% (43/160) of open explorations were supported by best-evidenced practice⁽²⁾.

Imaging:

Multidetector computed tomography angiography (MDCTA) neck was the most common imaging modality, performed in 58.4% of patients. MDCTA neck ‘hot’ reports matched consultant reports in 92% (115/125) of cases.

Imaging reports matched operative findings in 51.6% (64/124) of cases. Venous injuries were the most common false positive and false negative finding.

Morbidity and Mortality:

The mortality rate was 1.4% (3 patients), and morbidity was limited since no patients required a tracheostomy on discharge.

Conclusion

The “no zone” approach to PNT is effective at predicting internal injuries, and could help reduce the high number of inappropriate surgical explorations. Inexperience does not influence the accuracy of radiological trauma reports, but imaging is only accurate in approximately 50% of cases when compared to operative findings.