Stab injury – the experience of an East London Hospital 1978–1983

W.S.L. Stebbings, L.J. Chalstrey, O.J.A. Gilmore, W.S. Shand, M.D. Staunton, and J.P.S. Thomson.

Department of Surgery, Homerton Hospital, Homerton Row, London E9 6SR, UK.

Summary: A retrospective review of 201 patients with stab wounds admitted to an East London Hospital over a period of six years was performed. There was no striking increase in the annual incidence of these injuries over the period reviewed. The majority of patients were young males who arrived at the Accident and Emergency Department after 1800 h on a Friday, Saturday, or Sunday and had consumed alcohol prior to admission. There were 47 abdominal injuries (23%), 69 thoracic (34%), 51 limb injuries (25%) and 34 injuries involving the head and neck (17%). Forty patients (20%) had injuries involving more than one site. Abdominal stabbings were managed by a selective approach resulting in 28 laparotomies of which only 2 (7%) were negative. Evisceration of small bowel or omentum was always associated with significant intraperitoneal injury.

Introduction

In view of a suspected increase in civilian violence it was decided to perform a retrospective review of all cases of stabbings (201 patients) requiring admission to the Hackney Hospital over a six year period. This district general hospital has as its catchment area one of the more deprived socioeconomic areas of London. The aim of the study was to determine whether there had been an increase in the prevalence of such injuries, and to determine whether any form of trend could be identified in the types and severity of injury, and in their subsequent management and prognosis.

Patients and methods

This was a retrospective study analysing the case notes of 201 patients admitted with stab wounds to the Hackney Hospital between January 1978 and January 1984. One hundred and eighty eight (93%) were male and 13 (7%) female (of whom 11 had been assaulted either by their respective spouse or boyfriend). The sites of the major injury were as follows:- 47 abdominal injuries (23%), 69 thoracic (34%), 51 limb (25%) and 34 injuries involving the head and neck (17%). However, one in 5 stabbings involved more than one site which in the majority of instances were superficial to the upper limbs. The ages ranged from 13 to 61 years, the commonest being the second and third

decades (Figure 1). In 177 cases (88%) the weapon was a knife. Other weapons included screw drivers, scissors, broken glass, car aerials, swords and a bayonet. The majority (67%) of the incidents occurred at the weekend, and 167 patients (83%) were admitted to the Casualty Department between 1800 h and 0600 h. One hundred and twenty eight patients (64%) had been drinking alcohol at the time of injury (Figure 2), and 84 patients (42%) were unemployed. Racial distribution was as follows; 109 Caucasians (54%), 80 Blacks (40%), and 12 Indians (6%). Five patients were dead

Figure 1 Age distribution in 201 cases of stabbing.

Correspondence: W.S.L. Stebbings, F.R.C.S.,
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Figure 2 Percentage of injuries associated with alcohol intake (n = number of patients).

on arrival at the Accident and Emergency Department and were not included in this study nor were 6 patients with superficial self inflicted stab wounds.

Results

The number of stab injuries requiring admission to hospital in each year is shown in Figure 3.

Abdominal injuries

Forty seven patients had penetrating abdominal wounds, of which 28 (60%) required laparotomy. The jejunum was the organ most commonly injured, followed by the small bowel mesentery. One patient, who had been advised to have a laparotomy, took his own discharge only to be admitted to another hospital 24 hours later and undergo laparotomy for jejunal perforations. The stab wounds occurred mainly in the upper abdominal quadrants (32 on the left, 68%) and were multiple in 8 cases (17%). The average hospital

Figure 3 Stab wounds requiring admission. January 1978–December 1983.

stay for patients undergoing laparotomy was 9 days compared to 3 days for the observed group. Twenty two patients (47%) had stab wounds in other sites as well, of which 12 (25%) were thoracic. Retrospectively, 2 of 28 laparotomies could have been avoided and the patients treated conservatively (i.e. they were negative laparotomies).

Of those undergoing laparotomy, 16 of 28 (57%) showed signs of peritonism (tenderness, guarding and rebound) and only 7 of 28 (25%) had absent bowel sounds. Six of 28 (21%) had evisceration of small bowel or omentum, and all of these cases had more than one organ injured. All patients had erect abdominal X-rays, but only 3 of 28 (11%) had free air under the diaphragm radiologically. Five patients presented with a systolic blood pressure less than 80 mm, of whom 4 had major arterial bleeding and the other patient had combined liver and chest injury. Twenty of 28 patients (71%) requiring laparotomy needed blood transfusion.

There was no mortality or significant morbidity in the observed group of 19 patients. In the 28 who underwent laparotomy, there was one death and 6 (21%) developed post-operative complications, comprising 4 wound infections, one chest infection, and one late incisional hernia.

Chest injuries

Of the 69 patients with chest injuries, 41 patients (59%) showed no radiological evidence of chest penetration. These patients were admitted for observation and were discharged home 24–72 hours later, as long as a repeat chest X-ray showed no abnormality. None of these patients developed a late haemothorax or pneumothorax. The only complication was radiological evidence of basal atelectasis in one patient. Twenty eight patients (41%) showed radiological evidence of chest penetration (surgical emphysema, pneumothorax, haemothorax or combinations of these 3 findings). Fifteen of these 28 were treated solely by the insertion of a chest drain, and 10 with signs of persistent bleeding required thoracotomy. Nineteen patients required a blood transfusion greater than 2 units of blood.

Head and neck injuries

There were 34 patients with injuries of the head and neck, of whom 11 (32.4%) patients needed exploration of their wounds under general anaesthetic. The facial artery was severed in 8 cases, and the facial nerve in 2. There were 3 cases involving injury to the carotid sheath, two of which were confined to the internal jugular vein, and the internal carotid artery was severed in the third. The most severe injury was sustained by a 21 year old woman, who had her neck

slit from behind, and also received multiple stab wounds to her chest and abdomen. Her larynx was transected at the level of the vocal cords, and the anterior wall of her oesophagus was divided.

Limbs

Patients were admitted with limb injuries when a decision had been made to explore the wound surgically in order to exclude neurovascular or tendon injury. Fifty one patients with limb injuries were admitted, 48 of whom had upper limb injuries and only 3 injuries of the lower limbs. Forty five of the 51 explorations were carried out under general anaesthetic and in the upper limb the most common injury was to flexor tendons. If feasible, primary repair of both severed tendons and nerves was always attempted.

Discussion

This study has not shown the striking increase in the incidence of stab wounds that has been reported by other authors,^{1,2} but there is an impression of an increasing trend (Figure 3). As has been reported in other series,³ we found that the majority of patients were under the influence of alcohol, and 42% of them were unemployed. Ninety four patients (46.7%) were submitted to surgical exploration under general anaesthetic, which must be considered a not inconsiderable burden to the hospital resources both in terms of manpower and cost.

All patients with abdominal stab wounds were admitted to hospital, thus avoiding the possibility of sending home a patient with a severe visceral injury. Considerable controversy exists regarding the management of penetrating abdominal stab wounds. One school of thought feels that mandatory exploration is essential,^{4,5} whereas others are of the opinion that as this leads to a high negative laparotomy rate, a selective approach should be used.^{6,7} In this series a 'selective approach' had been employed not in response to a definite hospital policy, but as a result of the clinical viewpoints on management of these injuries of individual surgical registrars involved. The majority of abdominal stab wounds in this series were located in the left upper quadrant, which is presumably the most likely point of impact for a right handed assailant. The presence of free intraperitoneal air on plain abdominal X-ray was only present in 11% of cases and therefore could not be relied upon to make a diagnosis of peritoneal penetration.

The decision to operate was based on repeated clinical examinations, in order to note either the development of peritoneal signs or a change in the patient's vital signs. The main indications for laparotomy were signs of peritoneal irritation (tenderness, rebound, guarding and rigidity), unexplained shock or evisceration of abdominal contents. The presence of bowel sounds did not exclude intra-abdominal injury. It is interesting to note that in this study all patients who had evisceration of either small bowel or greater omentum had significant intra-abdominal organ injuries. Granson & Donovan⁸ reported a 69% incidence of major intra-peritoneal injury in association with omental evisceration. We would therefore support the selective approach to the management of abdominal stab wounds but feel that mandatory laparotomy is required in the case of evisceration. Peritoneal lavage was not used routinely, as it was felt that if there was an indication for peritoneal lavage there was probably an indication for laparotomy, and equivocal results do not conclusively rule out visceral injury. However, peritoneal lavage may be of use when there is an altered level of consciousness resulting in unreliable clinical examination. A negative laparotomy rate of 7% and one death in 47 patients compared favourably with other series.⁵⁻⁸

More than half (59%) of the chest stabbings showed no evidence of chest penetration radiologically. These patients were admitted for observation for up to 3 days although none of them developed a complication. Karanfilian *et al.*,⁹ who described complications in 3 out of 102 cases of non-penetrating stab and gun shot wounds to the chest, suggested that this group of patients did not require admission to hospital, and would thus provide a considerable saving in both staffing resources and cost. Ten of 28 penetrating injuries (35.7%) required thoracotomy. The initial treatment of all injuries that showed radiological evidence of chest penetration was the insertion of a large chest drain. This results in evacuation of blood from the chest cavity and allows the lung to expand and thus stops further bleeding from the lung parenchyma. McNamara *et al.*¹⁰ have suggested that initial drainage of greater than 1.5 litres is an indication to proceed to thoracotomy. However we would agree with Lambrianides & Rosin² that it is the 'subsequent course of events' that is important. In this series thoracotomy was performed if there was clinical evidence of persistent bleeding as assessed by the vital signs and the output of fresh blood from the chest drain.

References

1. Malmgren, S., Hasselgren, P.O., Hellman, A. & Seeman, T. Increasing incidence of stab wounds. *Acta Chir Scand* 1983, **149**: 337–340.
2. Lambrianides, A.L. & Rosin, R.D. Penetrating stab injuries of the chest and abdomen. *Injury* 1984, **15**: 300–303.
3. Donaldson, L.A., Findlay, I.G. & Smith A. A retrospective review of 89 wounds to the abdomen and chest. *Br J Surg* 1981, **68**: 793–796.
4. Moss, L.K., Schmidt, F.E. & Creech, O. Analysis of 550 stab wounds of abdomen. *Am Surg* 1962, **28**: 483–489.
5. Maynard, A.L. & Oropeza, G. (1968). Mandatory operation for penetrating wounds of the abdomen. *Am J Surg* 1968, **115**: 307–312.
6. Lee, W.C., Uddo, J.F. & Nance, F.C. Surgical judgement in the management of abdominal stab wounds. Utilizing clinical criteria from a 10 year experience. *Ann Surg* 1984, **199**: 549–554.
7. Wilder, J.R. & Kudchadkar, A. Stab wounds of the abdomen observe or explore? *JAMA* 1980, **243**: 2503–2505.
8. Granson, M.A. & Donovan, A.J. Abdominal stab wounds with omental evisceration. *Arch Surg* 1983, **118**: 57–59.
9. Karanfilian, R., Machiedo, G.W. & Bolanowski, P.J. Management of non-penetrating stab and gunshot wounds of the chest. *Surg Gynecol Obstet* 1981, **153**: 395–397.
10. McNamara, J.J., Messersmith, J.K., Dunn, R.A., Molot, M.D. & Stremple, J.F. Thoracic injuries in combat casualties in Vietnam. *Ann Thorac Surg* 1970, **10**: 389–401.