Toward earlier diagnosis of splenic injury?

C. A. J. McLAUCHLAN, M. MAHESON, J. P. SLOAN & F. DOVE
University Hospital, Nottingham, England

SUMMARY

A series of patients who were found at operation to have sustained splenic rupture is described and their immediate presenting features are detailed. Signs of peritoneal irritation were not always present and patients were not often 'shocked' when first seen. Helpful early signs included a low haemoglobin and pallor.

There is a tendency to underestimate the significance of left quadrant pain in the presence of rib fractures. Peritoneal lavage and ultrasound should be more readily employed. Text book features should not be expected early and this must be taught to junior doctors who work in accident and emergency medicine.

INTRODUCTION

It is generally believed that it is not difficult to diagnose rupture of the spleen. *Bailey and Love's Short Practice of Surgery* (Harding Rains & Ritchie, 1984) states that, in patients with ruptured spleens, abdominal rigidity is present in more than 50% of cases and that local tenderness is found constantly. Bowel sounds are not mentioned. Ellis & Calne's *Lecture Notes on General Surgery* (1977) states that pallor, hypotension and rising pulse will be seen after several hours, along with signs of peritoneal irritation. Cochrane (1980), in his review of splenic rupture, states that the diagnosis is easily made except in the presence of unconsciousness or associated major injuries. He does state that loss of bowel sound occurs later. These descriptions generally apply to inpatient examination some time after trauma.

This study was undertaken to clarify the very early clinical features in patients with ruptured spleen.

METHODS

A retrospective study was undertaken from both operating theatre and hospital activity analysis records between the years of 1984 and 1986 at the University Hospital, Nottingham, England. A 24-month period was studied and notes of all those who had undergone splenectomy were extracted. Those resulting from blunt trauma were analysed. A record was made of the initial presenting signs, initial investigations and outcome. Patients with severe multiple injuries are not included, as it was felt that their clinical features would not necessarily relate to splenic injury. This resulted in a significant number of exclusions.

RESULTS

A total of 20 cases of ruptured spleen were included in the study. The age range was 6–75 (median 25.5). The 10 features seen most commonly are shown in Table 1, ranked in decreasing order of frequency. All but two patients had been brought to the Accident and Emergency Department immediately after injury and the findings presented were recorded within 1 h of injury. No patient was receiving blood at this time.

There was a time interval between injury and definitive diagnosis of at least 12 h in eight of the 20 cases, though six of these patients had been admitted for observation. Five of these eight had fractured lower ribs on the left and their hypochondrial tenderness was ascribed to these fractures. Assessment of three of these patients was made more difficult by high blood alcohol levels (two in excess of 220 mg per 100 ml). The two patients who were not admitted subsequently re-attended because of abdominal pain.

DISCUSSION

In the 20 blunt trauma cases studied, the classical features were often not present initially and, in eight cases, there was diagnostic difficulty causing a significant time delay; such a time delay may have serious consequences. In five of the 10 patients in whom diagnosis was delayed, signs were ascribed to rib fractures and the abdomen ignored. Clearly such patients require to be admitted and kept under close observation. This is particularly important as bowel sounds are well known to be present initially in these patients, 70% of this series having bowel sounds on presentation.

Only four patients (20%) had a systolic blood pressure below 100 mmHg at presentation, and only two patients (10%) demonstrated combined tachycardia and hypotension. Pallor is often associated with rapid blood loss, but the authors noted this in two teenagers without tachycardia or hypertension. This is presumably due to the excellent compensatory mechanisms which exist in the young, where rapid fluid shift from the extra-cellular compartment to the intra-vascular compartment may occur. This may explain the finding that five patients (25%) had a low haemoglobin within

Table 1 Initial features in 20 cases of ruptured spleen

Feature	No (%) (Total = 20)
Left upper quadrant tenderness	11 (55%)
Fractured lower left ribs	8 (40%)
Abdominal rigidity/guarding	7 (35%)
Absence of bowel sounds	6 (30%)
Leucocytosis	6 (30%)
Haemoglobin below normal*	5 (25%)
Pulse rate > 110	5 (25%)
Hypotension (systolic < 100 mmHg)	4 (20%)
Pallor	4 (20%)
Abdominal bruise/abrasion	3 (15%)

*Normals taken as: Hb males 13.0–18.0 G/DL; WBC 4.0–11.0 × 10⁹/litre; females 11.5–16.5 G/DL.

minutes of injury. Two of the patients with abnormal blood counts had no clinical signs of blood loss at first presentation. The raised white counts were presumably non-specific reactions to trauma.

The authors do not routinely perform abdominal girth measurements as they would seem to have no value in the assessment of the injured abdomen, (Fairclough *et al.*, 1984).

Peritoneal lavage has been recommended in cases of diagnostic difficulty (Cochrane, 1980), it can have a high degree of accuracy (Van Dongen & De Boer, 1985) and it appears to be especially useful in diagnosing splenic injury (Wilkinson, 1978). In this series, lavage was undertaken twice: it was positive on both occasions and contributed toward the decision to perform early surgery (neither of these patients were 'shocked'). An ultrasound scan was positive in another young patient who presented with local tenderness and an abnormal blood count, and it was used in several other patients to confirm the clinical diagnosis. Ultrasound scanning may be particularly useful in diagnosing intracapsular haematomata and it is likely that the two patients who were sent home in this series were suffering from this injury. Diagnosis may be especially difficult in the presence of alcohol, reduced consciousness and multiple injury, and in these cases other investigations (such as peritoneal lavage or ultrasound) should be considered.

The early diagnosis of splenic injury is difficult. Relying on 'textbook' diagnosis features may be misleading as these may be absent. A higher index of suspicion and the more ready use of diagnostic procedures is required amongst those who receive patients in accident departments.

REFERENCES

- Cochrane J. P. S. (1980) Ruptured spleen. *British Journal of Hospital Medicine* 24, 398–404.
Ellis H. & Calne R. Y. (1977) *Lecture notes on General Surgery*, pp. 322–3. Oxford, Blackwell Scientific Publications.

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- Fairclough J. A., Mintowt-Czyz W. J., Mackie I. & Nokes L. (1984) Abdominal girth an unreliable measure of intra abdominal bleeding. *Injury* **16**, 85–7.
- Harding Rains A. J. & Ritchie H. D. (1984) *Bailey and Love's Short Practice of Surgery*, pp. 828–9. London, H. K. Lewis & Co. Ltd.
- Van Dongen L. M. & De Boer H. H. M. (1985) Peritoneal Lavage in closed abdominal injury. *Injury* **16**, 227–9.
- Wilkinson A. E. (1978) Rupture of the spleen: an analysis of 180 cases. *South African Journal of Surgery* **16**, 47–53.