Rupture of the spleen in a patient with a perforated duodenal ulcer and infectious mononucleosis

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Summary

A 72-year-old patient presented as a sealed perforated duodenal ulcer. This was later confirmed at operation when in addition a haemoperitoneum due to a lacerated friable spleen was discovered. The patient denied antecedent injury. The peripheral blood film was normal but a subsequent differential slide test for infectious mononucleosis was positive. Histology of the spleen showed hyperplasia of the red pulp in addition to capsular and trabecular infiltration with lymphocytes and atypical mononuclear cells confirming the diagnosis. Infectious mononucleosis in the elderly is rare and a complicating rupture of the spleen at this stage has not been reported previously. The diagnosis may depend on the histology alone because the peripheral blood film and serology can be negative. The possible role of the perforated duodenal ulcer is discussed.

Introduction

Rupture of the spleen is usually secondary to known trauma, most commonly during upper abdominal surgery or as a consequence of a road traffic accident (Devlin, Evans and Birkhead, 1969; Danforth and Thorbjornarson, 1976). Rupture without known preceding injury is a rare occurrence (Orloff and Peskin, 1958) although first reported in 1874 by Atkinson. Hyun, Varga and Rubin (1972) suggested that in cases of non-traumatic rupture the term 'spontaneous rupture' be used when the spleen is normal and 'pathological rupture' when the spleen is diseased.

Most causes of splenomegaly have at one time been reported as predisposing to rupture. The commonest diseases associated with 'pathological rupture' are malaria and infectious mononucleosis (Custer and Smith, 1946); rupture being quoted as the commonest cause of death in the latter (Rawsthorne, Cole and Kyle, 1970).

'Spontaneous rupture' of the normal spleen is now well documented but remains rare. It usually presents as an acute upper abdominal emergency masquerading as a perforated duodenal or gastric

ulcer (Orloff and Peskin, 1958) but it may also present with chronic symptoms suggesting a diagnosis of carcinoma of the stomach (Grech, 1971; Foley *et al.*, 1969). 'Spontaneous rupture' is also recorded in pregnancy (Embrey and Painter, 1962) and it may rarely complicate anticoagulant therapy (Soyer, Merk and Aldrete, 1976; Seltzer and Quarantillo, 1973). Earlier reports of rupture of the spleen complicating septicaemia from an extra-abdominal source such as a carbuncle are not well documented (Deihl, 1924; Miller, 1961). Rupture of the spleen has been reported as a complication of acute pancreatitis (Gardner and Preston, 1961) but no previous report can be found of rupture associated with perforation of a duodenal ulcer.

Case history

A 72-year-old woman was referred from her practitioner with a 2-week history of abdominal pain, distension, nausea and anorexia. Three days earlier she had developed severe epigastric pain followed by generalized abdominal tenderness; both improved without medication. She had not vomited and there was no history of melaena. Twelve years previously a barium meal for a similar pain had shown duodenal deformity but she had been asymptomatic since then.

On examination she looked fit for her years, weighed 56 kg and was afebrile. She was pale with a haemoglobin of 10.6 g/dl and there was no lymphadenopathy. The epigastrium was tender to deep palpation and the abdomen tympanitic with generalized distension and loss of liver dullness. There were no physical signs to suggest peritonitis and the bowel sounds were normal. Rectal examination showed normal coloured faeces. Erect X-ray films of the abdomen showed free gas under the diaphragm (Figs 1 and 2). The blood urea, electrolytes and prothrombin were normal. Gastrografin meal showed an anterior duodenal ulcer without leakage of contrast medium into the peritoneal cavity. A provisional diagnosis of a sealed perforated duodenal ulcer of 4 days duration was made. Because of her

general well-being surgical intervention was not urgently indicated and conservative treatment with intravenous fluids was adopted. Two days after admission the patient developed mild left subcostal pain, but there was no alteration in the physical signs. On the fifth day because of increasing pallor the haemoglobin was again estimated and found to be 6 g/dl, an apparent fall of 4.6 g/dl. The packed cell volume was 18.8%. The peripheral blood film showed a normochromic normocytic anaemia, suggesting a recent haemorrhage but no obvious source of bleeding could be found. There was no evidence of excess haemolysis and the total white cell count was $3 \times 10^9/l$ with a normal differential count. The patient had not vomited and there had been no melaena. She denied abdominal trauma and there was no shoulder pain.

She had developed a low grade pyrexia of 37.8°C and a sub-hepatic abscess complicating the perforated duodenal ulcer was suspected but there was no change in the physical signs to support this diagnosis. The fall in haemoglobin was unexplained and she was transfused with 6 units of blood in preparation for operation.

Laparotomy was undertaken 14 days after admission through a right paramedian incision. Free gas was apparent on opening the peritoneum and free blood was present throughout the peritoneal cavity. A small abscess (5 ml) walled-off by liver above, the omentum and the anterior wall of

FIG. 1. Right lateral erect X-ray showing subdiaphragmatic gas.

FIG. 2. Erect upper abdominal X-ray showing subdiaphragmatic gas.

the duodenum below, was assumed to be the site of an old perforation of a chronic duodenal ulcer. The pus was drained but dissection was not extended to identify the site of perforation. Exploration of the left hypochondrium revealed a large quantity of old blood clot which was loosely adherent to the diaphragm and spleen. Eight hundred ml of blood and clot were removed allowing inspection of the spleen which showed several lacerations on the diaphragmatic surface and lower pole (Fig. 3). It was noted to be exceptionally soft and friable. Splenectomy was performed without difficulty. The splenic bed and sub-hepatic abscess were drained. Postoperative recovery was uneventful.

Culture of the pus from the sub-hepatic abscess grew *Streptococcus pneumoniae*. Pre-operative culture of the sputum had yielded the same organism and subsequent screening test for *Strep. pneumoniae* antigen was negative.

When questioned after operation, the patient again denied any history of trauma or symptoms to suggest a diagnosis of glandular fever. Re-examination confirmed the absence of lymphadenopathy and repeated examination of the peripheral blood revealed no abnormality and showed no lymphocytosis or atypical mononuclear cells. A differential slide test for the heterophile antibodies of infectious mononucleosis (Monospot test, Ortho, New Jersey) was positive on three occasions during the three post-operative weeks.

The spleen weighed 225 g and measured $12 \times 7 \times 3$ cm. A preliminary report on the histology of the spleen was normal but repeat examination of further sections showed the typical features of infectious mononucleosis. The capsule and trabeculae were infiltrated with lymphocytes and abnormal mono-

nuclear cells (Fig. 4) and there was hyperplasia of the red pulp with large numbers of immature lymphocytes and atypical mononuclear cells.

Discussion

Enlargement of the spleen is a common occurrence in acute systemic infections and it may increase to two or three times its normal size (Boyd, 1970). It is well recognized in pneumonia, septicaemia, acute endocarditis and typhoid but rupture of the septic spleen has only occasionally been reported. The most recent reported case was secondary to renal sepsis (Reisman and Logan, 1968). The patient now described had a perforated duodenal ulcer unrecognized for several days and subsequently developed a sub-hepatic abscess from which *Strep. pneumoniae* was cultured, identical with that found in the sputum. The pneumococcal antigen test performed postoperatively was negative, indicating that she had not had septicaemia due to this organism. Infection probably reached the abdomen by ingestion of infected sputum.

Splenic size and weight vary considerably and are known to decrease with advancing years. Although weighing 225 g (normal range 150–200 g) and having dimensions within the normal limits, it seems likely that this represented considerable enlargement in someone of her age and size. In Custer and Smith's series (1946) of seven patients with a ruptured spleen due to infectious mononucleosis no spleen weighed less than 425 g. All the patients were, however, much younger, the oldest being 29 years.

Infectious mononucleosis has a marked predilection for young persons; only 21% of cases occurring in patients over the age of 25 years (Finch, 1969). In patients over the age of 30 years the illness is

FIG. 3. The spleen showing lacerations on the diaphragmatic surface,

FIG. 4. Capsule and red pulp of the spleen showing heavy infiltration with lymphocytes and atypical mononuclear cells. A small laceration is visible. HE, $\times 88$.

often atypical and few patients over the age of 60 years have been described with infectious mononucleosis (Shapiro and Horwitz, 1959). The danger of rupture of the spleen in this condition is well documented (Yurko, Winegarner and Kinsey, 1965) and accounts for 25% of the deaths in this otherwise benign condition (Finch, 1969). In England and Wales between 1962 and 1972 an average of eight patients die of infectious mononucleosis each year (Registrar General, 1974) but the proportion in which death is due to rupture is not recorded. Since rupture is said to carry a 20% mortality (Sakulsky *et al.*, 1967) it must be a rare event in the United Kingdom.

Positive differential tests for the heterophile antibody of infectious mononucleosis are usually regarded as diagnostic of the condition. False positives are very rare but have been reported with pancreatic neoplasm (Sadoff and Goldsmith, 1971), rubella (Phillips, 1972) and rheumatoid arthritis (Horwitz, 1973). It should be remembered that resurgence of heterophile antibody reactions may follow respiratory tract infections (Hoagland, 1963).

The characteristic histological features of the ruptured spleen of infectious mononucleosis are infiltration of the capsule, trabeculae and adventitia of blood vessels with lymphocytes and mononuclear cells and massive hyperplasia of the red pulp (Custer and Smith, 1946). These were the features noted in the spleen of the present patient. Infiltration of the capsule and trabeculae so weakens the architecture of the spleen that it is rendered susceptible to damage by otherwise trivial trauma. Similar infiltration of splenic blood vessels may predispose to subcapsular

spontaneous haematoma which subsequently breaks down to cause rupture. In the case described the spleen will have been rendered additionally fragile owing to intra-abdominal sepsis.

Antibody studies and histology strongly suggest that the patient presented suffered from infectious mononucleosis. The normal peripheral blood film need not detract from the diagnosis because the lymphocytosis which normally accompanies the disease often reverts to normal after the third week of the illness. It is at this time that the spleen is said to be most likely to rupture.

Examination of sections of the spleen by a pathologist experienced in this field and aware of the possible diagnosis may be necessary for the features of infectious mononucleosis to be recognized since peripheral blood films and antibody studies may be negative. The part played by septicaemia secondary to perforation of the duodenal ulcer cannot be assessed by histological examination but it seems likely that this contributed to the course of events in this patient.

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Chronic active hepatitis, haemolytic anaemia and *Listeria monocytogenes* bacteraemia

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Summary

The association of chronic active hepatitis with haemolytic anaemia is well known. Both conditions may respond to steroid therapy which, in common with other causes of suppressed T-lymphocyte function, predispose to many types of infection. A case is described in which transient *Listeria monocytogenes* bacteraemia occurred and the patient recovered without antimicrobial therapy.

History

A 53-year-old woman was admitted to hospital with 3 weeks' history of jaundice, dark urine and pale faeces. She had been breathless on exertion, and tired for 1 week.

On examination she was pale, but deeply jaundiced. A firm, smooth, non-tender liver was palpable 10 cm below the costal margin. There was no splenomegaly and no skin stigmata of chronic liver disease.

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Investigations

Haemoglobin 6.7 g/dl, PCV 0.20, MCHC 33 g/dl, ESR 150 mm in the first hour; reticulocytes 16%; direct Coombs' test negative; haptoglobin absent; Schumm's test weakly positive; sucrose water test negative; red cell life by ⁵¹Cr labelling 15 days; stool blood loss normal; total bilirubin 200 μmol/l (11.7 mg/dl); direct van den Bergh 149 μmol/l (8.7 mg/dl); aspartate transaminase 357 u./l (normal value 5–42 u./l); alkaline phosphatase K.Au./dl; albumin 28 g/l (2.8 g/dl); globulin 55 g/l (5.5 g/dl); IgG 35 g/l (3.5 g/dl); serum caeruloplasmin 6.8 mmol/l (43 mg/dl); antinuclear factor 1 : 20 (speckled); smooth muscle antibody titre strongly positive; mitochondrial antibody absent; liver biopsy showed chronic aggressive hepatitis.

Management

The patient was treated with prednisolone 30 mg reducing to 20 mg daily. The haemolytic anaemia responded completely and the serum proteins and liver function tests returned to normal.