

# Ruptured Splenic Artery Aneurysm

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## SUMMARY

A case of ruptured splenic artery aneurysm is presented. The eventual outcome after surgery is favourable.

A short review of the literature is presented. From this it is suggested that these aneurysms be dealt with surgically in certain unruptured cases in order to prevent the high mortality associated with rupture. The absolute indications for surgery in unruptured cases are those occurring in young patients whose aneurysms are over 3 cm in diameter and are not calcified. This applies particularly to those found in women of childbearing age. Further relative indications for surgery are enlarging and symptomatic aneurysms.

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Aneurysms of the splenic artery are the third most common of the intra-abdominal kind, after abdominal aortic and iliac artery aneurysms,<sup>1</sup> and occur more commonly in females than in males.<sup>2</sup> The uncomplicated lesions have in the past been treated expectantly. More recently, however, because of the unacceptable mortality of rupture with exsanguinating haemorrhage,<sup>3</sup> there has been a tendency to resort to operative therapy in unruptured cases.<sup>4</sup>

The patient presented here highlights the life-threatening effects of intraperitoneal rupture of a splenic artery aneurysm with catastrophic bleeding.

## CASE REPORT

A female patient aged 63 years presented to the Professorial Surgical Unit, having suddenly collapsed at home. She had no previous history of cardiovascular disease, but had previously attended the Haematology Clinic for investigation of a low serum gamma globulin, the cause of which remained obscure. Splenomegaly had been noted. The rest of the history was not helpful.

Examination revealed a severely shocked and pale middle-aged woman, with a blood pressure of 60/40 mmHg, pulse rate of 104/min, and no evidence of cardiac failure. The abdomen was slightly distended and slightly tender generally, and the spleen was not palpable. Emergency laboratory investigations showed a haemoglobin of 10.5 g/100 ml, and normal blood urea and electrolytes.

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The patient was transfused with whole blood and submitted to gastroscopy (because there was a history from her husband that she had vomited blood earlier in the day). No abnormality was noted in the stomach.

As the instrument was being manoeuvred through the pylorus, the patient collapsed again, but was rapidly resuscitated and submitted to urgent laparotomy. The abdomen was entered through an upper midline incision. A large amount of fresh blood was found in the peritoneal cavity and this was found to originate from a ruptured aneurysm of the splenic artery, situated 2.5 cm from the hilum of the spleen, and 2.5 cm in diameter. The spleen was found to be slightly enlarged.

Aneurysmectomy and splenectomy were performed, during which procedure the patient's condition was grave, requiring rapid infusion of 8 litres of whole blood and 4 litres of electrolyte solution to keep her blood pressure up.

The postoperative course was complicated by a massive pulmonary embolus on day 10, and this was successfully treated with anticoagulants and supportive therapy.

Histology of the aneurysm showed a thin arteriosclerotic wall. The spleen contained an abundant number of histiocytes which stained sea-blue with Giemsa stain. Whether this represents primary sea-blue histiocytosis is debatable, since the bone marrow was negative. A liver biopsy was not done.

## DISCUSSION

### Incidence

The incidence of aneurysms of the splenic artery is difficult to assess accurately. The relative incidence with respect to other intra-abdominal aneurysms is consistently quoted as being third after abdominal aortic and iliac artery aneurysms.<sup>1-3</sup> The reported incidence in random postmortem examinations varies from 0.01% of 8 669<sup>5</sup> to 10.4% of 250 consecutive autopsies.<sup>6</sup> Bedford and Lodge<sup>6</sup> reviewed the collected incidence in 100 241 autopsies from various centres, reported between 1888 and 1941. The total number of splenic artery aneurysms found was 38, an over-all autopsy incidence of 0.03%. In comparing this incidence with their own of 10.4%, they quote two previous reports of similarly high incidence (8% of 50 autopsies and 9.8% of 143 autopsies). It is possible that the discrepancy in these figures may be accounted for by the care exercised in looking for an aneurysm of the splenic artery at autopsy, and by the age of the patients, the incidence being higher in the elderly. Radiological confirmation of the commonness of the condition found at coeliac angiography,<sup>7</sup> adds further support for a high autopsy incidence.

The unusual preponderance of females with splenic artery aneurysms<sup>3,8,9</sup> cannot be explained on the basis of aetiology, as they are most often caused by arterio-

sclerosis.<sup>3,10</sup> This contrasts sharply with arteriosclerotic aneurysms occurring elsewhere, which are five times more common in the male.<sup>11,12</sup> Although 20% of all ruptures have been reported to occur during pregnancy,<sup>13</sup> it is unlikely that this could account for the sex incidence of unruptured aneurysms, as the female preponderance has been observed in the elderly as well.<sup>6</sup>

## Rupture

The true incidence of rupture is unknown, but is probably low.<sup>14</sup> It is extremely important to try and predict those aneurysms which are most likely to rupture, as the mortality of rupture ranges from 46% in previously asymptomatic cases<sup>3</sup> to 80% in those associated with pregnancy.<sup>15</sup> The likelihood of rupture depends on the age of the patient, the size of the aneurysm, and whether it is calcified or not.<sup>14</sup> Aneurysms of the splenic artery occurring in patients over the age of 60 years are much less likely to rupture than those discovered in younger patients. Most ruptured aneurysms are over 3 cm in diameter. Calcified aneurysms very rarely rupture, only four such cases having been reported.<sup>14</sup> In women of childbearing age, pregnancy appears to predispose to rupture.<sup>15</sup>

Rupture may theoretically occur into any adjacent structure, and has been reported as occurring into the retroperitoneum, lesser sac, free peritoneal cavity through the foramen of Winslow, the stomach, colon, pancreas, left pleural cavity, and splenic and renal veins.<sup>4</sup>

## Diagnosis

The clinical diagnosis of these aneurysms is extremely difficult, as symptoms prior to rupture are rare, variable and non-specific.<sup>4</sup> Apart from the occasional case presenting with an audible bruit or a pulsatile lesion in the left hypochondrium,<sup>16</sup> symptoms and signs directly attributable to an aneurysm are those associated with either total or limited rupture. Common associated findings are portal hypertension<sup>2,7</sup> and splenomegaly<sup>3,17</sup> (without portal hypertension). Most unruptured cases are discovered incidentally on X-ray examination, either by the classical annular calcification in the left hypochondrium, or on selective coeliac angiography done for some other reason.<sup>7</sup> Only 15% of splenic artery aneurysms are sufficiently calcified to show up on straight X-ray films of the abdomen.<sup>18</sup> In one series of 192 consecutive selective coeliac angiograms

done for various reasons, splenic artery aneurysms were found in nine.<sup>7</sup> False negatives occur when the aneurysm is lined by thrombus.<sup>19</sup> In addition, the condition may be suspected if a pulsatile filling defect is demonstrated in the posterior wall of the stomach during barium meal examination.<sup>3</sup>

## Treatment

In patients who present with rupture, the treatment is surgical. The problem of management arises when cases are found coincidentally, either during radiographic procedures, or at laparotomy for some unrelated condition. This problem really revolves around the prediction of which cases are likely to rupture. It would seem reasonable to operate on those patients who are under 60 years of age, whose aneurysms are over 3 cm in diameter and not calcified. These are the cases that are discovered coincidentally at laparotomy or on coeliac angiography. These indications are probably absolute in those patients who have symptoms which may be attributable to the aneurysm. The situation in respect of annular calcification in the left upper quadrant on straight X-ray film of the abdomen, is not as simple. In these patients the diagnosis should be confirmed on coeliac angiography. If the size of the aneurysm is assessed as being under 3 cm, it may probably be safely left, especially if the patient is over 60 years old and is asymptomatic. If the aneurysm is seen to enlarge on follow-up X-ray films, surgery should be undertaken. Aneurysms discovered in women of child-bearing age should probably all be dealt with surgically

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