The diagnosis and management of splenic artery aneurysms

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Summary

The presentation and course of 7 patients with splenic artery aneurysms is reviewed. Three presented with abdominal pain, 2 with collapse and rupture and in 2 it was an incidental finding. Four patients had elective ligation-excision of the aneurysm with splenectomy as had one patient operated on as an emergency, with no operative mortality. The aneurysm size ranged from 20 to 45 mm (mean 30 mm) and histology confirmed atheroma. One patient was managed as a myocardial infarct for 8 hours after admission and a ruptured splenic aneurysm was diagnosed at autopsy, an overall mortality of 14%. A 66-year-old woman in poor general health was managed expectantly and was asymptomatic when lost to follow-up after 2 years.

Introduction

Splenic artery aneurysms are relatively uncommon, less than 0.1% in one large autopsy series¹, and not often considered in the differential diagnosis of abdominal pain or, more importantly, in sudden collapse. They are however, the most common intra-abdominal aneurysms apart from aorto-iliac aneurysms²⁻⁴. Recent figures suggest that the incidence is significantly higher than was previously assumed^{2,5}. Splenic artery aneurysms uniquely occur more frequently in females⁶ and tend to present in a younger age group than aneurysms in general^{7,8}.

We have reviewed all patients who presented to our service with splenic artery aneurysms over the past 10 years to determine the prevalence and to ascertain the mode of presentation and clinical course.

Patients and methods

The records of all patients with a diagnosis of splenic artery aneurysm presenting to the Charitable Infirmary, Jervis Street, Dublin between 1973 and 1983 were reviewed. The age and sex of the patient was

recorded, the histology and the role of investigations was studied and operative details with subsequent management correlated with mode of presentation.

Results

The patients were aged from 40 to 70 years with a mean age of 55 years. The male:female ratio was 2:5. Of 7 patients reviewed, 3 presented with abdominal pain, 2 with rupture and collapse and in 2 cases it was an incidental finding on plain abdominal X-ray. One of those who presented with rupture died, and was diagnosed at autopsy, giving an overall rupture rate of 28.6% in this study (Table 1).

The diagnosis was made on plain abdominal X-ray alone in one case, by angiography alone in one case and by combined plain abdominal X-ray and angiography in 3 cases (Figure 1). Of the remaining 2 cases, one was diagnosed at autopsy and another intra-operatively during laparotomy for an abdominal catastrophe. Emergency surgery was carried out in 2 cases, elective surgery in 4 and one case was managed conservatively. As all these aneurysms were in the splenic hilus, splenectomy with resection of the distal splenic artery was carried out. One of the patients had a history of hypertension.

All aneurysms were sacular and ranged in size from 20 to 45 mm with a mean size of 30 mm. Histology confirmed atheroma in the 5 patients who underwent operation and all were true endothelium-lined aneurysms.

The patients reviewed can be divided into two groups; those operated on electively and those who were urgent presentations. One patient with an incidentally-discovered aneurysm was unfit medically for either angiography or operation, was managed conservatively but was lost to follow-up after 2 years.

Figure 1. A coeliac angiogram confirming a splenic artery aneurysm

Table 1. Splenic artery aneurysm: clinical details

Management	Age	Sex	Presenting features	Size (mm)	Outcome
Elective surgery	51	F	Pain	2.7	Well
	40	F	Pain	2.5	Well
	56	F	Pain	3.5	Well
	45	F	Incidental	2.0	Well
Emergency surgery	70	M	Collapse	4.5	Died
	57	M	Pain and collapse	3.0	Well
Conservative management	66	F	Incidental	No operation	Lost to follow-up

A typical patient from each group is reported.

Case 1: A 40-year-old woman with 8 children was admitted for investigation of upper abdominal pain which was aggravated by movement. Full renal, biliary and gastro-intestinal tract investigations were normal. A ring-like calcification in the left hypochondrium on plain abdominal X-ray was thought to be consistent with splenic artery aneurysm. A splenectomy with excision of the aneurysm was carried out. Histology showed a 25 mm aneurysm with atheromatous change in both the artery and the aneurysm. The patient made an unremarkable recovery and was symptom free at subsequent follow-up.

Case 2: A 57-year-old man presented with frequency of micturition and incomplete bladder evacuation. The history was otherwise unremarkable. The patient had grade II benign prostatic hypertrophy, and an intravenous pyelogram and plain film showed no evidence of intra-abdominal calcification. The patient had an uneventful transurethral resection of the prostate. Nine months later he presented with left loin pain and was re-admitted for investigation. While in hospital he collapsed with unrecordable blood pressure and a diagnosis of ruptured aortic aneurysm was made. An emergency operation was performed at which a ruptured splenic artery aneurysm was discovered. A splenectomy was performed and histology confirmed a 30 mm aneurysm with atherosclerosis. The patient made a full recovery and is well to date.

The details of the 7 patients are summarized in Table 1.

Discussion

The natural history of any intra-abdominal aneurysm is rupture⁹. Embolism and thrombosis have also been reported, especially associated with pancreatitis¹⁰, although none of our patients had a history of pancreatitis. Therefore, in patients who are otherwise well, resection should be undertaken as soon as the diagnosis is made. The limiting factor to a successful outcome in many patients with aortic aneurysms is concomitant cerebral and coronary atherosclerotic disease¹¹. Because of a reported higher incidence of splenic artery aneurysm in females and during pregnancy^{1,2,3,12} and the younger age at presentation, factors other than degenerative atherosclerotic disease may be important. In this group it has been suggested that small aneurysms may be better treated conservatively. Certainly both ruptured aneurysms in the present group were over 30 mm diameter (10 mm larger than the non-ruptured group).

The predominance in females previously reported^{2,6,7,13,14} is reflected in this study with a male:female ratio of 2:5. Various reports on aetiology of splenic artery aneurysms have reported the incidence of atherosclerosis as between 50%¹⁴ and 99%^{4,7,12}. All aneurysms in our study showed atherosclerosis but this may be a secondary phenomenon.

We considered 2 groups of patients, those who underwent elective surgery and those with urgent presentations. Of the elective group, all were female with a mean age of 48 years. This is younger than the usual age of presentation of patients with other manifestations of atherosclerotic disease. The mean aneurysm size was 30 mm and no correlation could be inferred between size and rupture.

Of the patients who presented urgently, 2 were male, mean age 64 years and mean aneurysm size was 37.5 mm. One of the patients who presented urgently was diagnosed as having a ruptured splenic artery aneurysm at autopsy; both male patients presented

with ruptured splenic artery aneurysms, an overall rupture rate of 28.6% which is significantly higher than previous reports^{4,12,14}.

Management of patients has been recommended based on the following criteria; symptomatic patients, females of childbearing age and pregnant females should undergo elective resection. Patients with an aneurysm greater than 15 mm in diameter should also undergo elective resection. Patients over 60 years of age who are asymptomatic and have aneurysms of less than 15 mm in diameter can be managed conservatively⁵.

The outcome of splenic artery aneurysm rupture is poor and mortalities between 76 and 90% has been reported. However, more recent results show an improvement in this figure with a mortality of one in 3⁴ which is comparable with the one in 2 mortality from rupture in this study.

Results of elective surgery are good^{4,9,14} and all patients operated on electively in this study are well to date. There was no significant morbidity as no other concomitant procedures were performed.

In summary, a small group of patients with aneurysms of the splenic artery is reviewed. The diagnosis needs to be considered in emergency abdominal surgery and mortality is high with rupture. As the natural history is to enlarge and rupture, elective resection should be undertaken, but perhaps it is reasonable to temporize in elderly patients with other vascular disease and with small aneurysms, such as less than 20 mm as suggested by other authors¹⁶. Finally, the preponderance in younger females and pregnancy suggests an aetiology other than atherosclerotic but this could not be established from a review of the histology.

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