

Case report

Ruptured adrenal artery aneurysm: a case report

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Abstract. A case of ruptured adrenal artery aneurysm is presented. The ultrasound, computed tomography and selective renal angiography findings are described in detail. Aneurysms of adrenal arteries are particularly rare. Early diagnosis is important because of their tendency towards rupture and subsequent high mortality rate.

Key words: US – CT – Angiography – Aneurysm – Adrenal gland

Introduction

Aneurysms of adrenal arteries are particularly rare. Early diagnosis is important in these entities because of their tendency towards rupture and subsequent high mortality rate [5, 8]. We present a case of a ruptured aneurysm of the left inferior adrenal artery.

Case report

A 75-year-old man who presented with left upper quadrant abdominal pain was admitted to our department in order to scrutinize his clinical problem. For several days he had been treated conservatively for “left kidney colic”. Upon admission, the patient was in stable condition while pale and ill in appearance. On physical examination, his temperature was 36.7°, blood pressure 120/70 mmHg and pulse 92 beats/min. The bowel sounds were normal. There was a tenderness in the left part of his back (positive Giordano’s sign). Rectal examination was negative, and stool specimen gave a positive test for occult blood. As part of the patient’s work-up, two blood specimens were examined during the first 24 h [first specimen: Ht 33.6% (38.0–48.0), WBC

13,700 (4800.0–18800.0), glucose 203.0 mg/100 ml (75.0–115.0 mg/100 ml), urea nitrogen 75 mg/100 ml (15.0–54.0 mg/100 ml); second specimen: Ht 32.1%, WBC 10300, glucose 116.0 mg/100 ml, urea nitrogen 77 mg/100 ml, creatinine 2.10 mg/100 ml (0.90–1.60 mg/100 ml)]. The erythrocyte sedimentation rate was 48 mm/h. The urine test was normal. The patient mentioned a history of gastrectomy 40 years prior as well as coronary disease. He was nevertheless free of any urinary symptoms.

Ultrasound of the upper abdomen revealed a lesion of mixed echogenicity at the anatomical site of the left adrenal. A suspicion of fluid collection at the corresponding pararenal space was set. A CT scan of the upper abdomen was performed in order to evaluate the suspicious area. In fact, a round structure was revealed which seemed to be mostly cystic, placed at the site of the left adrenal (Fig. 1), while the presence of a haematoma at the perirenal and pararenal space could not be excluded.

Digital subtraction angiography of the left kidney was performed to round out the patient’s imaging evaluation. During the selective angiography of the left renal artery, using a 5-F cobra catheter, the left inferior adrenal artery appeared to be dilated, while an aneurysm of this artery was also revealed (Figs. 2, 3). This set the diagnosis of a ruptured left inferior adrenal artery aneurysm.

The decision about the final treatment strategy of this patient was made in conjunction with the referring clinician’s opinion and the patient’s wishes. The patient was treated surgically, and the imaging findings were confirmed during surgery. Histological examination of the material which was excised confirmed the presence of an aneurysm of an adrenal artery with peripheral thrombus (Fig. 4). The patient had complete resolution of symptoms and is alive and well (13 months clinical follow-up).



Fig. 1. A CT scan of the upper abdomen reveals the presence of a round structure at the anatomical site of the left adrenal gland. Note the presence of a haematoma (CT densities range from 80 HU for acute to 20 HU for chronic haematoma) at the left perirenal space. The low-density structure at the anatomical site of the right adrenal gland concerns an adenoma

Discussion

Visceral artery aneurysms are an uncommon form of vascular disease the pathogenesis and natural history of which remain incompletely characterized. Some cases of visceral vessel aneurysms have been reported; most of them regard aneurysms of renal [1], splenic [2] and hepatic [3] artery. Traditionally, the distribution of aneurysms among visceral vessels regards aneurysms of the

Fig. 2. Selective intra-arterial digital subtraction angiography (DSA) of the left renal artery. Note the dilatation of the left inferior adrenal artery and the contrast agent concentration indicative of an aneurysm

Fig. 3. Selective intra-arterial DSA of the left renal artery, parenchymal phase: aneurysm arising from the left inferior adrenal artery

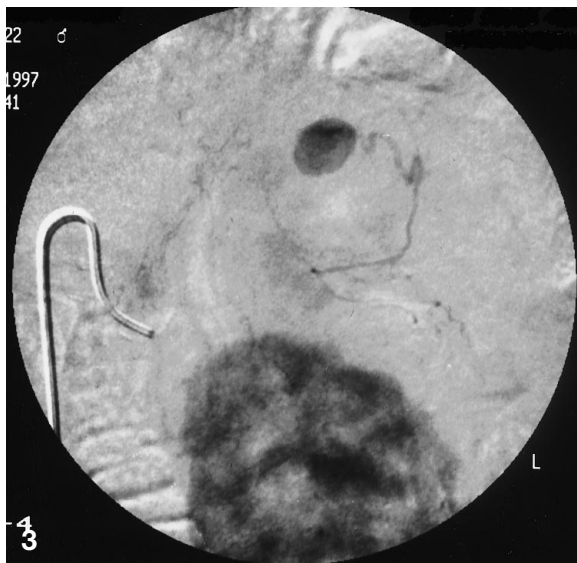
splenic artery (60%), hepatic artery (20%), superior mesenteric artery (5.5%), coeliac artery (4%), gastric and gastropiploic arteries (4%), jejunal, ileal, colic (3%), pancreatoduodenal and pancreatic arteries (2%), gastroduodenal (1.5%) and inferior mesenteric artery (< 1%) [9]. Twenty-two percent of such cases present as abdominal emergencies, of which 30% of patients die as result of rupture of their aneurysm [4].

Almost all visceral arteries can be involved, but we believe this to be the second report of an aneurysm of the adrenal artery [5]. Aetiological agents and predisposing events are multiple. The most common causes are atherosclerosis, primary arterial injury—trauma, congenital malformations, connective tissue disorders, local inflammatory conditions (such as cholecystitis and peptic ulcer), mycotic embolization, subacute bacterial endocarditis, vasculitis (such as polyarteritis nodosa) and medial dysplasia [11]. In particular, splenic artery aneurysms appear secondary to multiple pregnancies, portal hypertension, splenomegaly as well as after orthotopic liver transplantation resulting from an increased splenic blood flow and the influence of hormonal changes of pregnancy on the vessel wall. Inflammation caused by pancreatitis and pseudocyst formation may result in a splenic artery pseudoaneurysm, which can occur in up to 10% of patients with pancreatitis.

A high flow state in a collateral artery between two intestinal arteries, one of which is occluded or stenotic, can also cause aneurysmal formation [10]. However, a mechanism of spontaneous rupture of visceral artery aneurysms has not been reported. Hypertension and increased blood flow could be considered as the main causes of aneurysm rupture.

Abdominal pain is among the first symptoms in patients of this category, followed by collapse and signs of transient cerebral ischaemia as a result of vessel insufficiency due to the blood leak from the aneurysm. Subsequent disruption with hemoperitoneum produces peritoneal irritation and hypovolaemic shock.

Thus, preoperative angiography remains the definitive technique in order to evaluate precisely the location



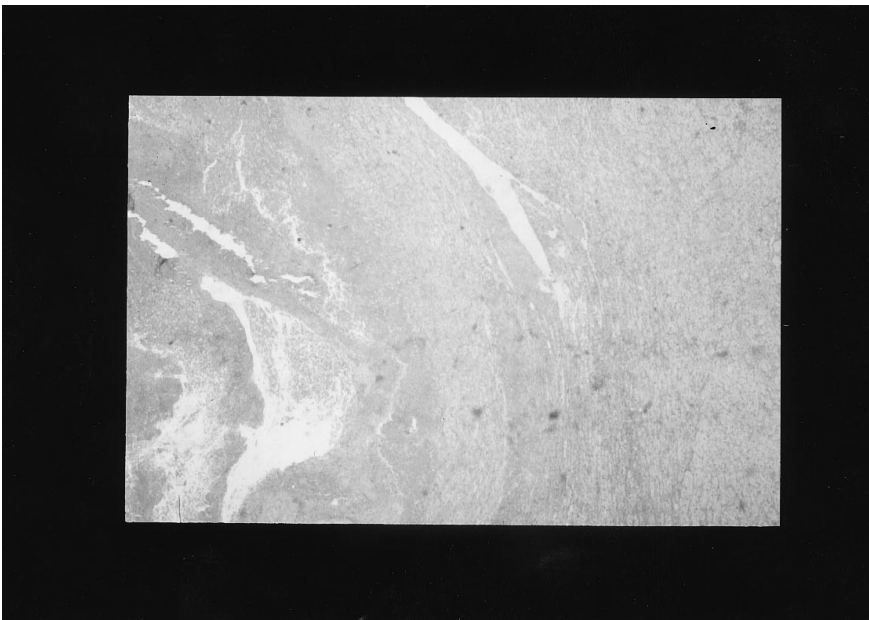


Fig. 4. Adrenal cortex. Arterial wall is discernible in the middle. The lumen is filled with thrombotic material. Haematoxylin and eosin $\times 100$

of the aneurysm as well as to identify the presence of other visceral artery aneurysms and collateral vessels (surrounding vascular anatomy) [9].

An aneurysm of a visceral artery must be treated because of the risk of rupture, especially when the diameter is large. Surgical treatment consists of exclusion by ligation of the arteries proximal and distal to the aneurysm with or without excision of the aneurysm. The topography of the aneurysm and the size of the artery may occasionally make it more difficult to reestablish vascular continuity, which is not mandatory when multiple anastomotic pathways are present. Several interventional techniques (transcatheter transluminal embolization with injection of coils or glue into the aneurysm) [7, 8] have been used for the successful treatment of patients with aneurysms of visceral arteries, especially of patients at high risk for surgical treatment [10].

Conclusion

Adrenal artery aneurysms are rare form of vascular disease but they have a significant potential for rupture or erosion into an adjacent viscera, resulting in life-threatening hemorrhage. Thus, treatment is indicated while interventional approach is feasible.

References

1. Lacombe M (1995) Aneurysms of the renal artery. *J Maladies Vasc* 20: 257–263
2. Mattar SG, Lumsden AB (1995) The management of splenic artery aneurysms: experience with 23 cases. *Am J Surg* 169: 580–584
3. Lumsden AB, Mattar SG, Allen RC, Bacha EA (1996) Hepatic artery aneurysms: the management of 22 patients. *J Surg Res* 60: 345–350
4. Stanley JC, Wakefield TW, Graham LM et al. (1986) Clinical importance and management of splenic artery aneurysms. *J Vasc Surg* 3: 836–840
5. Birchall D, Carney AS, Morse MH (1995) Case report: ruptured adrenal artery aneurysm. *Clin Radiol* 50: 732–733
6. Mitchell MB, McAcena OJ, Rutherford RB (1993) Ruptured mesenteric artery aneurysm in a patient with alpha-1 antitrypsin deficiency: etiologic implications. *J Vasc Surg* 17: 420–424
7. Beaujeux R, Saussine C, Al-Fakiz A, Boudjema K, Roy C, Jacqmin D, Bourjat P (1995) Superselective endo-vascular treatment of renal vascular lesions. *J Urol* 153: 14–17
8. Palumbo N, Cevolani M, Faggioli GL, Pedrini L, Rossi C (1995) Problems of indications for the treatment of aneurysm of the visceral arteries. *Minerva Chir* 50: 747–755
9. Messina LM, Stanley CJ (1997) Visceral artery aneurysms. *Surg Clin North Am* 77: 425–441
10. Gouny P, Fukui S, Aymard A, Decaix B, Mory H, Merland J, Nussaume O (1994) Aneurysm of the gastroduodenal artery associated with stenosis of the SMA. *Ann Vasc Surg* 8: 281–284
11. Graham JM, McCollum CH, DeBakey ME (1980) Aneurysms of the splanchnic arteries. *Am J Surg* 140: 797–801