

Giant splenic artery aneurysm, incidentally diagnosed



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Antonella Russo, Chiara Francia, Antonio Zaottini, Mario Pagliei

O.U.: Surgical Emergency, (Chief: dott. M.Pagliei), A.S.L. Roma G, Hospital "Leopoldo Parodi Delfino" Colferro (Roma), Italia

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Splenic artery aneurysm is a rare pathology, asymptomatic for a long time. It's in fact often revealed by its complications, such as the rupture and potentially fatal acute haemorrhage. It's incidentally discovered during instrumental exams, performed for other reasons, like the case of our woman, affected by ulcerating rectocolitis and suffering from renal colic pain, demonstrated. While surgical treatment is recommended for aneurysms larger than 2 cm in diameter or for symptomatic patients, or in pregnancy (condition known to lead to a rupture), or in case of growing dilatation, the size rarely exceeds 3 cm. The unsuspected echographic identification of giant splenic aneurysm (> 11 cm) is reported, eligible for elective surgery.

KEY WORDS: Echocardiography, Splenic aneurysm, Surgery

Introduction

Splenic artery aneurysm has been reported for the first time in 1770, incidentally found during an autopsy by Beassier ¹, while only in 1920 Haegler diagnosed intra-operatively this kind of lesion ².

Concerning splanchnic district, aorta and iliac arteries excluded, aneurysms involve more frequently all splenic artery (60%), then hepatic artery (20%), upper mesenteric vessel (5,5%), celiac trunk (4%), gastropiploic (4%), jejunal, ileal and colic arteries (3%), pancreatoduodenal and pancreatic vessels (2%), gastroduodenal (1,5%) and lower mesenteric artery (1%) ^{3,4}. Besides atherosclerotic degeneration, also the wider and wider use of diagnostic invasive procedures, such as selective catheterism predisposing to iatrogenic vessel dilatation, are encountered among risk factors. Clinical onset is characterized by dramatic complications, evolving to a frequently fatal rupture; the negative prognostic expectancy in this case justifies aggressive diagnostic and therapeutic approach.

Case report

G.M., woman, 49 years old, affected by long lasting ulcerating rectocolitis, was related because a mild pain localized in left hypochondrium, hip, and irradiated to the inguinal region of the same side, with positive Giordano's sign and urinary stick positive for hematuria and chetonuria. The initial symptoms were so mild that she preferred to follow at home the prescribed therapy. But 8 hours later the woman returned, because the symptomatology was now mimicking a renal colic, that responded to parenteral antispastic and analgesic treatment, and a second time the patient was permitted to return home. However 24 hours later she came for the third time into Emergency, as the pain was rising again. Clinical examination substantially remained unaltered, accompanied by vomiting but without fever; pain involved all the hepigastric region, with no posterior irradiation. Hepatopancreatic hematochimic profile was normal, but the ultrasound examination in emergency in the suspect of a lithiasic hydronephrosis, revealed an expanding mass, looking like the left kidney, but having ritmic pulsatility and vascular flow (Figg. 1,2). The wide investigation of upper abdomen revealed to be splenic artery, whose lumen was deformed by parietal unevenness. Aortic diameter and morphology were regular, excluding

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For correspondence: Antonella Russo, parco Poggio Vallesana, Ciclamino B/17, 80016 Marano di Napoli, (e-mail: tango.b@alice.it).

multidistrictual asymptomatic arterial degeneration (Fig. 3). Splenic arterial wall appeared thick, presumably affected by fibrotic reaction, with many calcificated thrombotic deposits, concentrated into the longest portion of aneurysm. EcoDoppler signal (Fig. 4) confirmed vascular origin of the mass, showing arteriosus turbulence, distinguished from laminar venous flow; subsequent CT with contrast enhancement revealed a giant aneurysm of splenic artery (>10 cm diameter), dislocating contiguous structures. The patient was transferred to specialistic section of cardiovascular surgery, where an elective ablation of the aneurysm was predisposed, thank to the steady haemodynamic state and the good performance status of the woman herself; rejecting the hypothesis of incidental diagnosis of the lesion.

Discussion

In favourable circumstances, such as that of our patient, incidental diagnosis of splenic arterial aneurysm accounts for 0,78% during arteriography and 0,1-10,4% of autopsies. The most of them are saccular type of aneurysm (others are fusiform, serpiginosous and of thr dissecting type), of small size (<2 cm), located at the distal third (74-87%) and the middle third (22%) of the branch, rarely interesting juxta-ostial segment, preferably affecting females (F:M = 4:1) and adults (50 years old) ^{5,6}. The risk of rupture, ranging from 3 to 9,6% is size-related (5,5 cm diameter is considered the cut-off value), and causes an high mortality rate (76%), especially during pregnancy, resulting 70% for the pregnant and 95% for the fetus ^{7,8}.

Visceral fistulization could delay the detection of complications, as hematemesis, melena, hemobilia, emosuccus pancreaticus, arterovenous fistulas, determining portal hypertension, very hard to be interpreted, are

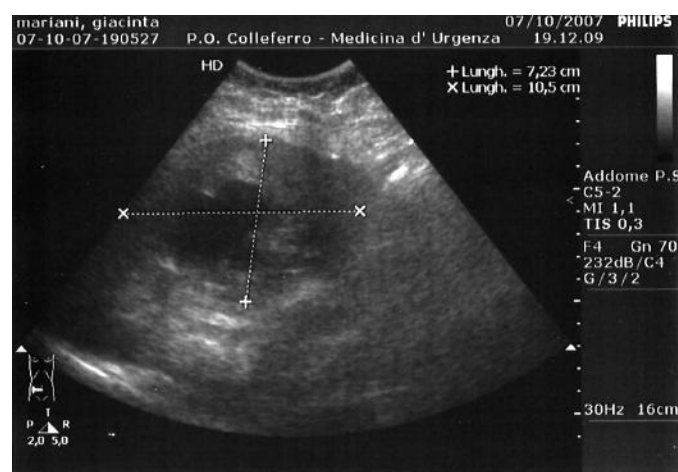


Fig. 1: Circling mass, surrounded by thick walls, shows intrinsic pulsatility, having anechogenic central area, corresponding to the distal third of splenic artery. Hyperechogenic spots of parietal layers, protruding into the lumen, suggest calcific ateromasic dregs.



Fig. 2: Longitudinal US scan of the largest site of dilatation (>11 cm), with endoluminal roughness and calcareous concretions.

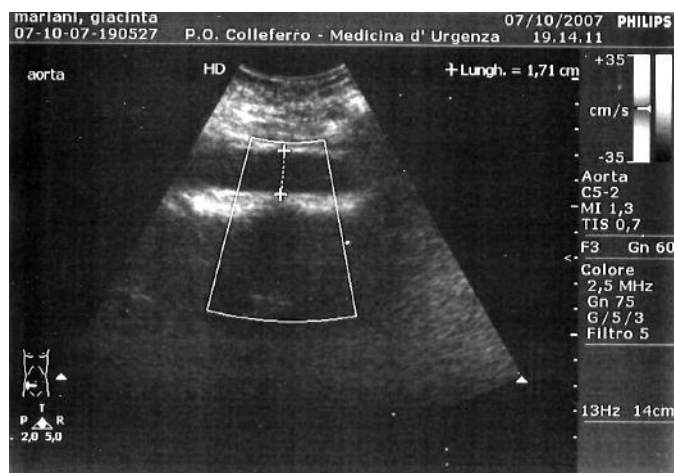


Fig. 3: Longitudinal US scan of abdominal aorta, having regular diameter (1,7 cm) excludes multidistrictuality of the pathology.

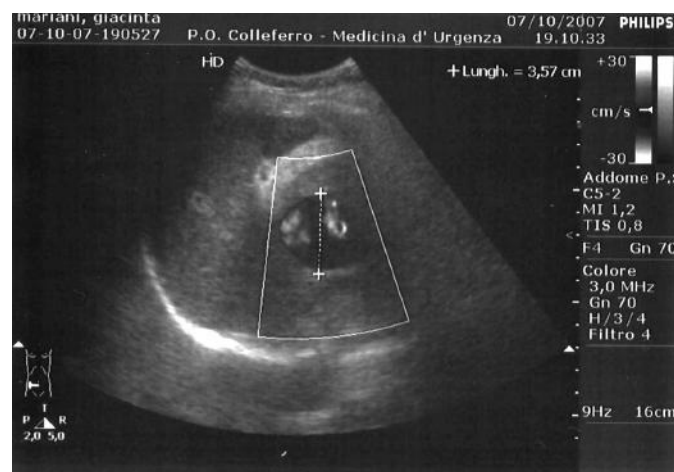


Fig. 4: EcoColorDoppler registers either aneurysmatic dilatation (3,57 cm), or hematic turbulence, caused by thrombotic appositions.

observed in such cases. In addition to the rupture, with potentially lethal bleeding, the aneurysm can be revealed by splenic infarction, or indirectly by adjacent compressed structures, such as biliary tree dislocation, causing pseudo-obstructive jaundice^{9,10}.

As well as the aortic more frequent degeneration, etiology of aneurysm is explained by increasing dilatation of elastic fibers of tunica media; besides the most common predisposing factors, comprehending mycosis, atherosclerosis (30-60%), systemic hypertension (20-30%), tabagism, syphilis, septic embolus, fibrodysplasia (15-30%), vasculitis (11-30%), and trauma (3-4%), splenic artery can be prone to aneurysmatic degeneration during hepatic cirrhosis, with subsequent portal hypertension (10%), or splenomegalia (7%); it's also observed in hepatic transplant recipients, or in women having many pregnancies (30-70%)^{11,12}. In this last condition increased splenic flow and estrogenic vasodilatation, with negative trophic vascular effect are ascribed.

Post-pancreatic pseudocysts must be considered as a risk factor, evolving into pseudoaneurysm in 10% of the patients^{13,14}. The exact mechanism remains still unknown, but two elements are needed: weakened wall and increased local hematic pressure.

Though atherosclerosis is the principal etiological factor of large vessel aneurysms, it's commonly found also in splenic aneurysms. In 40% of subjects it's multifocal and in 70% of them, several calcifications are noted. Giant aneurysm (>10 cm) are generally saccular type, like the described case and from 60 up to 95% of patients the symptoms can be totally absent, confirming incidental occurrence of the diagnosis. When they are symptomatic an abdominal pulsating mass can be palpable, associated to epigastric or left hypocondrial pain. The rupture of splenic aneurysm can occur during the first three months of pregnancy, causing false positivity for ectopic pregnancy or placental detachment or uterine rupture, with rapid fatal outcome.

Diagnostic iter, influenced by emergency or elective condition, usually comprehends sonographic investigation (US), CT, or contrast enhanced MNR and arteriography. However diagnosis can be incidentally suspected during radiological exams, performed for other reasons, when an anular or curvilinear calcification (pathognomonic sign) is found in left hypocondrium. Contrast enhanced CT is followed by arteriography, excluding multidistrictual degeneration and defining the status of contiguous anatomic structures, or mapping the lesion, (size, site, collateral flow, false lumen), for correct surgical planning. Unfortunately in clinical practice the rupture is the most common sign of the presence of the aneurysm, determining sudden abdominal sharp pain with hypovolemic shock; if the bleeding is confined in retroperitoneal space, an hemodynamic steady state is possible, making surgery feasible. When this anatomic protection is broken, hemoperitoneum through Winslow foramen and tender omentum is unavoidable, mimick-

ing symptoms and mechanisms of double-time splenic rupture, such as it has been described in 1930 by Brockman¹⁵.

Ultrasound preciously supports diagnosis in emergency (40%), while CT sensibility for hemoperitoneum is 67%. In elective regimen, the exact morphological and topographic evaluation of the lesion relies on arteriography (100%), while virtual endoscopy with helicoidal CT is a useful pre- and post-operative instrumental method^{16,17}. In described case ecocolor Doppler (Fig. 4) has been performed too; splenic artery shows a high diastolic flow, as for low resistance districts. Splancnic hemodynamic features can distinguish from myeloproliferative conditions, comprehending lymphomas and leukemias, (all with high flow), from post-hepatic cirrotic splenomegalia, characterized by reduced flow. Ecocolor Doppler is useful to detect hypo- or non-ecogenic dilatated areas along the vessel.

Absolute eligibility criteria for the treatment of aneurysm, either with conventional or laparoscopic surgery, or with radiological techniques, are: - symptomatic lesion; - pregnancy (rupture represents clinical onset in 95% of cases); - women in childbearing age; - vasculitis; - complicated portal hypertension. As for the relative indications, asymptomatic patients or < 2 cm aneurysms, the treatment protocol must be planned, balancing the rupture risk (3- 9,6%) and mortality rate in case of fixuration (76%)^{18,19}. When the diameter of aneurysm exceeds 2 cm, surgical excision must be recommended; treatment choices comprehend complete resection for low risk subjects and simple ligation for high risk patients^{20,21}. Percutaneous embolization is feasible, using selective catheterism and introducing Gelfoam or tungsten coils, or sclerotizing agents (Ivalon) or combining both procedures²². After complete stadiation of the lesion, concerning also the healthy vascular segment, the excision of the aneurysm is generally performed, clamping distal and proximal stump^{23, 24}, taking advantage of vasa breviora (though hemocatheretic splenic failure is possible). Specific splancnic abnormalities can contraindicate the resective surgical approach; severe adhesions involving vascular wall and pancreatic parenchyma after inflammatory damage, make simple ligation preferable, without any other resective manouvres²⁵; on the other side, especially in case of distal localization of the aneurysm, caudal pancreatectomy and/or splenectomy are possible. The treatment is still today controversial; some Authors²⁶ ruled out interventional radiology, preferring wide-open surgery, for multiple vascular lesions or aneurysms densely adherent to the pancreas, performing en bloc resection of pancreatic body and tail, spleen, celiac artery and common hepatic artery^{27,28}. Although aneurysm resection is generally followed by arterial reconstruction, a successful outcome is registered without any other vascular reconstruction.

At the same time, emergency embolization is also accepted to treat the high potential for rupture of multiple

splenic artery pseudoaneurysms, observed in portal hypertension, complicating cystic fibrosis²⁹. The non-operative splenic salvage rate is 94%, possible for persistent active bleeding after main coil embolization too^{30,31,32}. Though open surgical modalities nowadays represent the most safety management, laparoscopic and endovascular techniques can be applied, with a low morbidity for high risk subjects^{33,34}. Persistent flow, rebleeding, splenic injury and potential arterial rupture are in fact life-threatening complications of non operative choice that must be pointed up.

Conclusions

Reported case demonstrated the difficulty of the diagnosis due to non specific symptomatology and to a concomitant renal colic pain, which has been useful meanwhile to discover the uncommon pathology. This lesion infact can reach conspicuous size, with negative prognostic outcome. Diagnosis of this potentially fatal abnormality has been achieved in emergency on echography, assessing the subsequent contrast-enhanced CT stadiation, for elective surgery. Invasive treatment, either considering interventional radiology or surgery still remains the only therapeutic modality for this potentially lethal condition. Other pathologies could mimic left renal colic pain, complained by our patient, such as splenic injuries, ovarian or testicular torsion³⁵, retroperitoneal tumors, abdominal lymphomas, liposarcoma of perirenal fat tissue and/or of the sigmoid colon mesenterium. Vascular abnormalities and perirenal hematoma, occurring during antiplatelet medication, are also described³⁶. Ureteral kinking or extrinsic compression, caused by neoplastic masses or lymphadenopathy and vascular aneurysms, like our case demonstrated, can cause urinary obstruction, exitating in colic pain, even in absence of lithiasis.

In these patients anamnesis and instrumental investigation (US, CT, angiography, MNR), support differential diagnosis.

Riassunto

L'Aneurisma dell'arteria splenica è una rara patologia asintomatica per lungo periodo. Spesso, infatti, è rivelata delle sue complicazioni, come la rottura con una potenziale fatale emorragia. Viene incidentalmente scoperta durante esami strumentali effettuati per altre ragioni come nel caso della paziente osservata che era affetta da rettocolite ulcerosa e sofferente per colica renale.

Il trattamento chirurgico viene raccomandato per aneurismi di diametro superiore a 2 cm, in caso di pazienti sintomatici, in caso di gravidanza o in occasione di un incremento della dilatazione. L'insospettata identificazione con ecografia di un aneurisma gigante splenico (>11 cm)

viene riportata dagli Autori eligibile per un trattamento chirurgico.

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