

## Delayed and occult splenic rupture: a diagnostic puzzle

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**SUMMARY:** Delayed and occult splenic rupture: a diagnostic puzzle.

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*Splenic rupture is a common complaint encountered in emergency surgery. Trauma is the most common cause of splenic rupture, while non-traumatic or occult splenic rupture (OSR) is a rare condition. The differential diagnosis weighs on treatment that ranges between close monitoring, splenorrhaphy, splenic conservation and splenectomy. We report a case of an 63-year-old man presenting with acute atraumatic left upper quadrant pain. Preliminary diagnosis was subsequently determined to be a hematoma secondary to OSR. More accurate detailed history revealed a previous trauma, which occurred more than one year before and mimicked an OSR. Delayed and occult splenic rupture are as different diagnosis as different treatment. Even in emergency surgery, the key for a target therapeutic strategy should consider an accurate diagnostic time.*

**RIASSUNTO:** Rottura splenica tardiva ed occulta: un puzzle diagnostico.

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*La rottura splenica è di comune riscontro nelle emergenze chirurgiche. Il trauma è la principale causa di rottura splenica, mentre la rottura non traumatica od occulta è condizione rara. La diagnosi differenziale pesa sul trattamento che varia tra il monitoraggio stretto, la splenoraffia, la conservazione splenica e la splenectomia. Riportiamo il caso di un uomo di 63 anni con dolore acuto non traumatico nel quadrante addominale superiore sinistro. La diagnosi preliminare era di ematoma secondario a rottura splenica occulta. Un'anamnesi più dettagliata aveva rivelato un pregresso trauma, più di un anno prima. La rottura tardiva e la rottura occulta di milza sono diagnosi differenti con differente trattamento. Anche nelle emergenze chirurgiche la chiave per una strategia mirata dovrebbe considerare un accurato tempo diagnostico.*

**KEY WORDS:** Spleen - Occult rupture - Delayed rupture - Decision making.  
Milza - Rottura occulta - Rottura tardiva - Scelta decisionale.

### Introduction

Galeno considered the spleen a mysterious organ and nowadays it seems to be 'the puzzling organ', particularly in emergency surgery (1). Delayed splenic rupture (DSR) is an uncommon but well-recognized clinical entity after blunt trauma (2). Occult splenic rupture (OSR) is an atraumatic rupture. It has been reported in asso-

ciation with underlying splenic diseases, such as benign, malignant tumours, and congenital defect (3). We report a case of misleading DSR mimicking a OSR with trauma occurring more than one year before.

### Case report

A 63-year-old man, presented to emergency department (ED) with acute atraumatic left upper quadrant pain. He did not recall any trauma. Vital signs were normal. His physical examination was unremarkable except for abdominal tenderness in left hypocondrium. Laboratory analysis demonstrated haemoglobin 10 g/dL, white cells 8.600  $\mu$ L and C-reactive protein 5.0 mg/dL. Chest X-Ray showed a chronic bronchiolitis-emphysema complex. An abdominal ultrasound revealed the presence of an abnormal subcapsular soft tissue density in left hypocondrium. A computed tomography (CT) scan of the abdomen was subsequently performed.

The enhanced abdominal CT scan confirmed the presence of well-marginated homogeneous iso- and hypo-dense mass with homogeneous contrast enhancement in the spleen (Fig. 1). The organ injury's scaling identified a score IV according to Moore's classification and American Association for Surgery of Trauma (AAST) classification. A more accurate anamnesis revealed a forgotten domestic accident more than one year before. The patient was admitted for surgical treatment after intravenous antibiotics, pneumococcal vaccination, and antithrombotic prophylaxis in the form of low molecular weight heparin. Laparotomy has been performed. Surgical intervention revealed two different problems. First a subcapsular hematoma originating from upper pole of the spleen, latter an enormous hematoma in splenic loggia originating from lower pole of the spleen and infiltrating omentum. The lower pole parenchymal surface has been completely replaced with a dropping clot (Fig. 2). Moreover, a retroperitoneal hematoma extended beyond omentum, was observed. Therefore, the clinical evidence required a splenectomy and partial omentectomy. The patient was discharged uneventfully after four days. No infections nor complications occurred up until two months after the surgical procedure.

## Discussion

The spleen is the most involved organ along with the small bowel in abdominal traumas (30-40%), followed by the hepatic (18-24%), gastro-duodenal (10-12%) and pancreatic (4-7%) injuries (4-7). It's correct to assume that splenic blunt represents one of the most important surgical emergency. In the past, with a rudimentary understanding of the physiologic features and treatment of hemorrhagic shock, the mortality rate for nonoperative treatment of patients with ruptured spleens was 90% to 100%. Nowadays, the missed splenic rupture after blunt abdominal trauma is among the most frequent cause of death and undiagnosed injuries often turns out into a tragedy. Thus, the mortality-rate increases to 50% if the treatment is delayed compared to a much lower mortality-rate if diagnosis is in time. However, operative versus non operative management of splenic injury constitutes a fundamental component of decision-making surgical emergency (8).

DSR corresponds for 60% of all splenic injury. The classic clinical syndrome presents a retroperitoneal hematoma and hemorrhagic shock; otherwise as time passes it's possible to show the presence of a pseudo-cyst. This is the result of intraparenchymal or subcapsular hematomas organization. Evans has documented, in 1866, delayed splenic rupture from blunt abdominal injury; however Baudet described for the first time this phenomenon, known as the "latent period of Baudet" (9). A spleen rupture could manifest with plentiful haemorrhages even after a long time after the trauma. On the other hand, the injury of splenic pulp cannot be contained indefinitely by its capsule since it is continuously "triggered" by blood pressure or, in case of portal hypertension, by venous pressure. The "latency time"

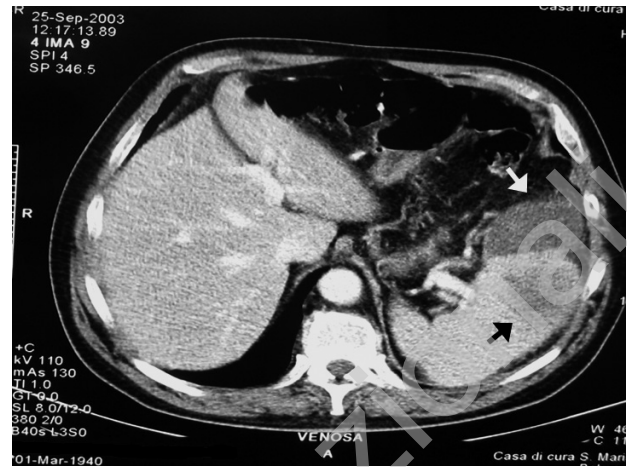


Fig. 1 - Enhanced abdominal CT scan. Previous subcapsular hematoma organization (white arrow), and intraparenchymal rupture with hemorrhage (black arrow).

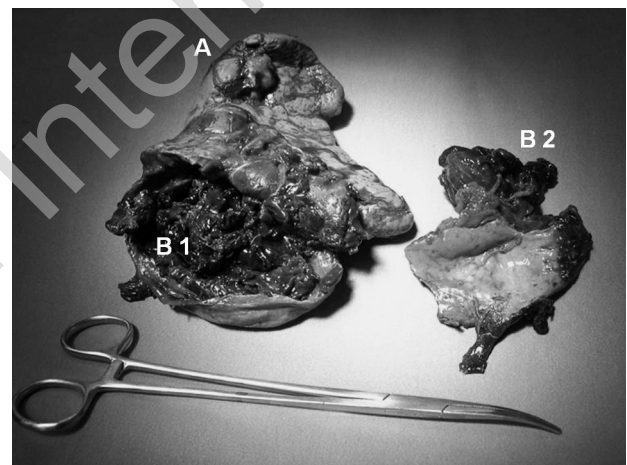


Fig. 2 - Specimen. Subcapsular hematoma originating from upper pole of the spleen (A); lower pole parenchymal surface completely replaced with a dropping clot (B1 and B2).

between the traumatic event and the spleen rupture, according to data from literature, is within two weeks, though even longer periods are reported in other case-series. Otherwise, in view of all the splenic traumas, in 1% of cases a different picture of symptom-free rupture could occur, namely the hidden rupture. In this instance the splenic capsule which has been damaged is unable to contain the subcapsular hematoma which is collected in the closed space consisting of the adhesions and ligaments between spleen and stomach, small bowel, large omentum and colonic splenic flexure. It could also happen that, during the performance of surgery for incarcerated inguinal hernia, a hemoperitoneum from unrecognized splenic rupture is evidenced (10). Although it is not frequently found

(about 2-5% of all the splenic traumas), the splenic rupture “in two times” is a clinical condition associated with a not negligible death rate. Splenic rupture “in two times” is correlated with the entity of the picture of hemoperitoneum, which is visible at a distance from the traumatic episode. Indeed, if the clinical-instrumental diagnosis of a splenic lesion may be defined as relatively easy, the same does not apply to splenic rupture after a “free” or “latency” interval. Symptomatology is correlated with the increase, with the passing time, in the volume of hematoma, which is generally localized in the central portion of the organ. The first critical problem in the diagnostic therapeutic course to be coped with, is of semantic order. In the relevant literature studies on broad case-series are missing and the data of splenic rupture are drawn from individual case reports. This has generated an unsatisfactory uniformity of definition. In our experience, it is important to use the distinction between splenic rupture in two times and hidden splenic rupture. In the first instance, rupture is the consequence of a known contusive trauma, in the second instance the causative event could be not a trauma or the trauma was of a moderate entity. The taxonomic distinction is not only a mere semantic discussion, but acquires a prognostic and decisional meaning.

The described clinical case is exceptional just for the broad “latency” interval. At first, the long interval makes the two diagnoses overlapped. On the contrary, the therapeutic choice demonstrates the importance of the distinction between DSR and OSR. A second factor is that in modern medicine the physician’s ability to make an accurate decision relies majorly on the results of instrumental diagnostic approach (11). Splenic rupture and in particular our case show the importance of a collection in depth of patient’s history. In the Emergency Room time is a critical restriction in the patient’s management. The ability to perform an action, the timely diagnosis and therapy are required factors for the success of therapy (12).

Guidelines and protocols were developed just to optimize the time of intervention. To this result the technological evolution has contributed which placed at disposal of the physician exceptional tools for the timely and accurate diagnosis (13). Unfortunately, this evolutionary process had a negative impact on the traditional diagnostic-therapeutic pathways which acknowledged that the patient’s history is the critical factor, which have become longer nowadays and, therefore, are considered to be obsolete. On the contrary, detailed history should be always the most important time in the diagnostic-therapeutic pathway. As an example, de-

tailed history is the single factor capable of “guiding” the interpretation of the images obtained from the pre-operative instrumental examinations. These latter (CT scan and ultrasound examination of the abdomen first of all) (14), sometime could be not conclusive since they can include in the differential diagnosis also a splenic localization of a lympho-proliferative disease with resulting therapeutic and prognostic outcomes of different entity. In our opinion, a post-traumatic splenic injury should be managed with a splenectomy due to the well-known difficulties in reaching an adequate haemostasis in cases of polar resections. This approach includes the present discussion about the “non-operative management” after abdominal traumas, a concept which was accepted in the past decade but which is not revised in the light of its complications (retention of necrotic tissue, secondary infection of initially sterile collections, under-estimate of the severity of trauma, etc.). Some authors focused on the role of the different imaging techniques in the identification of post-traumatic unrecognized complications, stressing the indications of a treatment with minimally invasive techniques, including laparoscopy, interventional angiography and echo-guided drainage (15). Already in the past some authors reported a positive experience in the conservative treatment by laparoscopy of post-traumatic cystic lesions of the spleen (16). In our experience we think that, outside the specialized centres, the performance of a splenectomy by laparotomy is safer.

## **Conclusion**

We report the case of a patient with a missed spleen lesion to discuss the special problem of the detailed history stages. Detailed history and diagnostic procedures are critical stages because of limited diagnostic and therapeutic possibilities. There is a risk of inadequate therapy in case of a sudden debasement of patient’s condition.

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