



Surgical Abstention in Blunt Spleen Trauma

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Abstract

The preservation of a traumatized spleen protects against serious infectious complications. The importance of non-surgical conservative treatment can be explained by the often simple evolution of splenic lesions, and a better lesion analysis provided by computed tomography. Despite this, there is still no radiologic criterion for operative indication. Only clinical evaluation makes it possible to decide on surgical abstention in a hemodynamically stable injured patient.

Keywords: Splenic rupture; Non-operative management; Spleen trauma

Introduction

The spleen is the most common solid organ involved in abdominal trauma. Splenectomy has long been the only treatment for splenic rupture, but a better understanding of infectious complications related to splenectomy has favored the development of splenic, surgical or nonsurgical preservation methods. The experience acquired in the conservative non-surgical treatment of splenic traumas in children with 90% success, explains the progression of this treatment in adults. In our research we are going to present 3 cases where the surgical abstention was efficient.

Case Series

Case 1

A 24-year-old man suffered a road accident, with initial loss of consciousness of ten minutes. He had bilateral pulmonary contusion, a larger left hemothorax on the left, L5 collapse without recoil of the posterior wall, and contusion of the lower pole of the spleen. The hemodynamic stability allowed the realization of a body-scan, after thoracic drainage. Intraperitoneal hematoma was moderate, Class II splenic lesion (Figure 1). Blood depletion was low with a hemoglobin level of 12.7 g/L at day 1.

The patient was placed under surveillance in intensive care, his hemodynamic status remained stable, and the CT scan, one week after the accident, showed a clear improvement in the splenic lesion.

Case 2

A 51-year-old woman who suffered a motor vehicle accident had a polytrauma involving a malar fracture, a fracture of six costal arches with a bilateral hemothorax, and a larger one on the left. The first CT scan, after thoracic drainage, showed a pulmonary contusion with bilateral pleural effusion, a contusion of the lower pole of the grade II spleen (Figure 2). Perisplenic hemoperitoneum was evaluated at 500 ml. There was anemia with 8.5 g/L of hemoglobin. Surveillance was continued, without additional bleeding, without blood transfusion. The splenic lesion rapidly regressed with resorption of the subcapsular hematoma (Figure 3). Hemothorax resolved more slowly and required respiratory rehabilitation.

Case 3

A 64-year-old woman, who fell from her height on the left side, was hospitalized 12 h after the trauma. She complained of left chest pain with scapular irradiation. In the presence of rib fractures on the chest X-ray, a CT scan was performed and showed a left hemothorax, a rupture of the grade III spleen, a Perisplenic effusion. Hemoperitoneum was evaluated at more than 500 cL. This patient remained hemodynamically stable. On the other hand, his hemoglobin level at 12 g/L at entry had dropped to 10 g/L at 1 (30.4% hematocrit) and then at 8 g/L at 2 d. Hemodynamic and clinical stability did not change the therapeutic attitude. No transfusion has been performed. Surveillance was continued during a hospital stay of 17 days in total, with a CT scan at seven and then 15 days. Left pleural effusion required two evacuation punctures (800 cL), combined with respiratory

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Figure 1: Case 1.

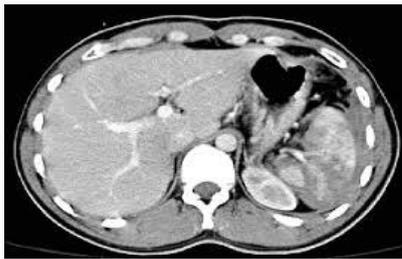


Figure 2: Case 2.



Figure 3: Case 3.

AAST Grade and Type of Injury	Description
I	
Hematoma	Subcapsular, <10% of surface area
Laceration	Capsular tear, <1 cm of parenchymal depth
II	
Hematoma	Subcapsular, 10%–50% of surface area; intraparenchymal, <5 cm in diameter
Laceration	1–3 cm in parenchymal depth
III	
Hematoma	Subcapsular, >50% of surface area; ruptured subcapsular or parenchymal hematoma; intraparenchymal hematoma, >5 cm in diameter
Laceration	>3 cm parenchymal depth or involving trabecular vessels
IV	
Laceration	Laceration involves segmental or hilar vessels producing major devascularization (>25% of spleen)
V	
Laceration	Completely shattered spleen
Vascular	Hilar vascular injury that devascularized spleen

Figure 4: AAST Grade and Type of Injury.

rehabilitation. CT scan at one month showed persistence of minimal subcapsular hematoma (Figure 2). One-year control was normal [1-3].

Discussion

The severity of splenic injury can objectively be described with a grading system developed by the American Association for the Surgery of Trauma. The grading is based on the CT scan, operative, or autopsy findings.

Spleen Injury Grading. NOM (Non-Operative Management)

Grades	Successful NOM
II	>95%
III	80%
IV	65 to 70%
V	<10%

Here I am going to list the most important guidelines encountered during this type of management:

The overwhelming post splenectomy infection, described in 1952 can occur in 0.5% to 2.5% of cases, and even in 11% of cases. It is more common in children than in adults. This syndrome can be declared late and is responsible for a death in more than 50% of cases despite attempts to splenic auto transplantation.

Conservative spleen treatment methods have been developed (splenorrhaphy using polyglactin net, partial resection) to preserve splenic function.

Non-surgical conservative treatment, or surgical abstention, is the basic treatment for childhood spleen trauma with a success rate greater than 90%.

On the other hand, in the adult, the surgical abstention is slow to impose and concerns only 25% to 30% of the wounded, with an

average success rate of 80%.

This is probably due to a more severe trauma and a higher incidence of associated intra-abdominal lesions (5% to 30%).

In laparotomies, many splenic lesions had stopped bleeding; an argument in favor of conservative surgical treatment and the development of surgical abstention.

The major risk of surgical abstention is hemorrhage. Secondary rupture of the spleen is rare, with a frequency of less than 2%.

The risk of hemorrhage is maximum in the first three days.

But it persists a risk beyond the fourth day, in about 5% of cases.

This threat is rarer beyond the 16th day but can be seen at three weeks. This delay of possible occurrence imposes a length of hospital stay according to the authors, from 12 to 21 days. The occurrence of an abscess of the splenic lodge, accessible to percutaneous drainage has been reported in the literature

Evidence of active hemorrhage is also an argument for an operative indication (focused hypodensity surrounded by a hypodense halo corresponding to a hematoma or a parenchymal lesion). This active hemorrhage was found in 45% of patients operated in a series of 150 patients. In the absence of extravasation of contrast medium, the success rate of forbearance is 86%. The importance of hemoperitoneum is also not a decision. Although analyzed by CT examination, the amount of hemoperitoneum is not correlated with the risk of failure of abstention. Eighty-five percent of the unoperated patients in the Goan et al. had a hemoperitoneum of at least 1 liter [4-6].

In contrast, the volume of hemoperitoneum must decrease within five days. Any persistence or increase in this effusion should result in an associated intra-abdominal lesion.

Although CT scanning is necessary and provides accurate lesional examination of closed abdominal trauma, its interest in monitoring non-operated splenic lesions is lower.

Echotomographic surveillance is sufficient, less expensive and more efficient.

In practice, the decision of non-surgical conservative treatment is multidisciplinary. It imposes initial surveillance in intensive care units (two to three days). Abstention is reserved for hemodynamically stable patients from the outset or after minimal filling by large molecules, and having no clinical sign of peritoneal irritation. There should be no clinical or CT evidence for an associated intra-abdominal injury requiring laparotomy. Classically, the patient should not be older than 55 years, although this is not an absolute criterion (observation 3). Finally, the computed tomography grade must be less than III. In fact, the indication must be assessed on a case-by-case basis, according to clinical tolerance [7-10].

Initial management requires strict bed rest, clinical and biological control three to four times a day by the resuscitator and the surgeon. If hematocrit is stable in the first 48 h, if abdominal pain disappears and there is a draft recovery of transit, ambulation is allowed, as well as the start of a re-feeding for a period of three to five days with transfer to the surgery department. Any delay in the resumption of transit or in the disappearance of the abdominal clinical signs should raise fears of an associated abdominal lesion. The duration of hospitalization was initially three weeks. It appears from the different reported experiences that an earlier exit between 12 and 15 days can be expected.

The imperative is to warn the patient of the risk of late rupture even if it is minimal. Rehospitalization is mandatory at the least pain.

A CT scan is preferable at the end of the first week. Echotomographic monitoring is sufficient thereafter. The resumption of activities is allowed to one month after scanner. The sport of contact is disadvised before three to six months [11-13].

Conclusion

Although surgical abstention has been proposed successfully in some spontaneous spleen pathological ruptures, it should be reserved for closed spleen traumas that are well-supported in hemodynamic terms. This management requires careful monitoring as there is a definite risk of hemorrhagic recovery, especially during the first 72 h. Thirty to thirty-five per cent of adult traumatic splenic lesions can benefit from this treatment with a success rate of more than 85%. In case of failure, the surgeon will try to keep the spleen (which is possible in 50% of cases). Since the early 1990s, splenectomy for traumatic rupture of the spleen has been performed in only one-third of cases.

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