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Videolaparoscopic treatment of spleen injuries

Report of two cases

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Abstract. Splenectomy is very frequently used to manage splenic lesions. Nevertheless, spleen-injured patients who have undergone splenectomy are exposed to hyposplenism.

Authors report two patients with splenic lesions treated by conservative surgery (with fibrin glue) using the videolaparoscopic method.

In both cases the preservation of the spleen was achieved.

The conservative treatment allows one to avoid the risk of hyposplenism and the videolaparoscopy provides the possibility to treat the patient with minimal surgical stress.

Key words: Peritoneoscopy — Spleen injuries — Biologic glue — Conservative surgery

The most frequent complication of abdominal trauma is spleen injury [6]. Usually the patient only shows a splenic lesion (30–70% of the cases), but rarely, other intraabdominal injuries can be present [2].

Splenectomy is the most frequently used method to manage spleen lesions; nevertheless, after the first observations of infective accidents following splenectomy [8, 12, 15], conservative surgery has been considered for safe treatment of patients with splenic trauma. Such a kind of therapy allows one to avoid the risk of postsplenectomy hyposplenism.

The recent large diffusion of coelioscopic surgery for the treatment of several abdominal diseases [4, 7, 18] suggests that a mini-invasive surgical approach might be suitable in performing a conservative therapy. Although the successes of the laparoscopic technique have been seen mainly in the field of elective surgery (biliary lithiasis, inguinal hernia, appendicitis, etc.), it can be used for emergency surgical procedures.

The conservative surgical therapy of splenic lesions by coelioscopic method offers the advantages of spleen preservation and the minimal surgical stress that characterizes the laparoscopic approach.

We report here on two spleen-injured patients who underwent conservative treatment by videolaparoscopic surgery.

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Patients and methods

Case report 1

A 42-year-old woman, multiply injured owing to a serious car accident (in which the driver died), was admitted at the Emergency Department showing hemorrhagic shock in hemodynamic compensation. The patient also had a head injury. The X-ray examination demonstrated multiple costal fractures and absence of pleuroparenchymal lesions. The abdominal ultrasonography showed an echogenic area located in the medial side of the spleen. Laboratory test results indicated anemia and leucocytosis.

Case report 2

A 26-year-old man with multiple trauma and head injury was admitted at the Emergency Department presenting coma status (third degree). Radiology proved multiple fractures of limbs. Ultrasound scanning showed multiple capsular hematomas of spleen and a capsuloparenchymal lesion located in the inferior polus. Laboratory tests showed anemia and leucocytosis.

Technique

For both patients videolaparoscopic treatment was considered.

The procedure required the introduction of a 10-mm trocar in the

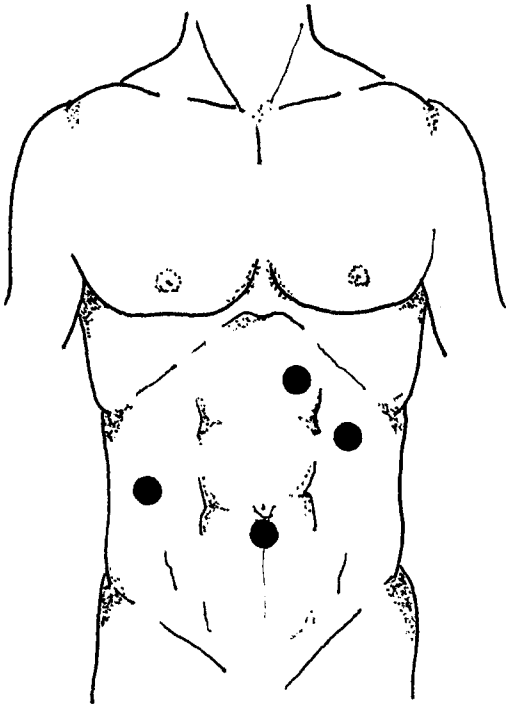

Fig. 1. Sites of portals for the conservative treatment of spleen injury

umbilical region, receiving the camera (25° angle of view), two 5-mm trocars in the left hypochondrium, receiving the suction/irrigation tube and the Duploject system, and a 10-mm trocar in the right flank, receiving the atraumatic grasping forcep (Fig. 1).

Both patients presented a hemoperitoneum with presence of blood in right and left parietocholic grooves, the rectouterine or rectovescical pouch, and the perihepatic area.

In case 1, after careful removal of the epiploon which coated the spleen, the medial side of the spleen was washed and a linear capsuloparenchymal lesion (from anterosuperior margin to hilus) was found.

In case 2, after removal of a big clot coating the whole splenic surface, a triangular-shaped capsuloparenchymal lesion involving the superior polus, other capsular lesions on the anterior margin, and a large capsular lesion of the splenic inferior polus were found.

In both cases, the estimation of the injuries, after the aspiration of hemoperitoneum and the washing of lesions and cavity, suggested a conservative treatment using fibrin glue (Tissucol) [3, 9, 14] and omentoplasty. The Tissucol was applied by a duploject catheter.

Later, the cleansing of peritoneal cavity and recesses was performed and a double tubular drain in the rectovescical or Douglas pouch and perisplenic area was inserted.

Both patients received intraoperative antibiotic prophylaxis.

Results

The postoperative follow-up of patient 1 showed the resolution of the clinical picture, with disappearance of the hemorrhagic shock. The ultrasonographic scanning on second, fifth, and seventh days confirmed the restoration of the lesions. Blood exams returned to normal levels. The restoration of the spleen lesions was also proved by scintigraphy performed 1 month later.

Patient 2 also presented resolution of the hemorrhagic shock and restoration of splenic lesions, confirmed by ultrasonography. Nevertheless, the patient died on the 10th postoperative day, owing to the severe head injury.

Table 1. Functions of the spleen

Hematocatheresis
Culling effect
Pitting function
Reticulocyte molding
Hematopoiesis (compensatory in adult age)
Immunologic function
Phagocytosis
Synthesis of opsonins
—specific opsonins
IgG and mainly IgM
—aspecific opsonins
tuftsin (enhancing phagocytosis)
properdin (activating the alternate pathway of complement)
Production of T and B lymphocytes
Maturation of B cells
Platelet, ferrum, factor VIII reservoir
Granulocyte storage
Others
Hormonal action
Antitumoral function

Discussion

The spleen has unique and vital functions (Table 1):

- Hematocatheresis
- Hematopoiesis
- Immunologic function
- Platelet, ferrum, factor VIII reservoir
- Granulocyte storage
- Hormonal action
- Antitumoral function [2, 5, 6]

The absence of splenic tissue due to splenectomy exposes the patient to a condition of hyposplenism with a real risk for the development of:

- OPSI (overwhelming postsplenectomy infection): due to a lowering of the immunologic surveillance (mainly in children); this condition occurs less often in patients who have undergone splenectomy for trauma than in those who are affected by other diseases needing such treatment because of the vicarious function of the uninjured extrasplenic reticuloendothelial system and the "born-again" spleen or splenosis.
- Thrombocytosis: due to disappearance of the culling effect and responsible for thromboembolic obstruction of mesenteric and portal vein [1] and cerebral and coronary vasa.
- Reduction of erythrocyte deformability.

A conservative therapy for splenic lesions (nonoperative treatment, partial splenectomy, autotransplantation, etc.) was frequently and successfully performed by authors in the past by laparotomic procedure [2, 17]. Such a method allows one to preserve functioning and effective splenic tissue and to avoid hyposplenism [10, 11, 13, 16].

In our experience, videolaparoscopic surgery ap-

pears important as a method with which to perform minimal invasive elective (biliary lithiasis, inguinal hernia, appendicitis, etc.) and emergency surgery (acute cholecystitis, perforated ulcer, intestinal obstruction).

In spleen-injured patients, such a method provides a completion of diagnosis, allowing one to identify the real site and size of lesions. Besides, it allows one to treat patients conservatively with minimal surgical stress.

From the reported cases, the combination of conservative surgical therapy and videolaparoscopy showed encouraging results; therefore, it can be successfully performed in spleen-injured patients with steady hemodynamic conditions.

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