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Original Article

Accessory Spleen Detection at Laparoscopic Splenectomy is Adequate for Immune Thrombocytopenic Purpura – a Prospective Study

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ABSTRACT

Objectives: Accessory spleens are foci of splenic tissue found commonly adjacent to the main spleen. Incidence ranges from 10 to 20% in general population. However, they occur with a higher frequency in patients with hematologic diseases. Immune Thrombocytopenic Purpura (ITP) stands out amongst these illnesses, and a detailed identification of these foci is extremely necessary to guarantee the therapeutic success. According to these data, the present study aims to analyze the effectiveness of laparoscopy in investigating the presence of accessories spleens. ***Methods:*** Thirty-seven patients with hematologic disease and indication for elective splenectomy underwent videolaparoscopy splenectomy, and they were documented prospectively. The technique preconized right lateral decubitus position and the use of three trocars. ***Results:*** The accessory spleen was found in eleven cases, what means 29.7% (11/37). However, neither the TC, nor the USG was capable to detect its presence in none of these cases where it was present. Eight patients (21.6%) needed transfusion during the surgery or postoperative period. The average length of hospital stay was of 2.41 days (varying of 2 to 6 days). The patients had been seen regularly in ambulatory, having an average follow-up time of 12.9 months. Of the 37 patients with ITP, 27 (72.9%) had satisfactory response with significant increase of platelets. No death, as well as major complications occurred. ***Conclusions:*** The data obtained in this study shows that laparoscopic splenectomy allows high accuracy for detection of accessory spleens and consequently, high rates of success in promoting permanent and complete remission of ITP.

Key words: immune thrombocytopenic purpura, ITP, accessory spleen, laparoscopy, laparoscopic splenectomy.

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1. INTRODUCTION

Accessory spleens are foci of splenic tissue found commonly adjacent to the main spleen. This phenomenon elapses of alterations in the embryologic development during the fifth week of intrauterine life. [1,8] Incidence ranges from 5 to 10% in general population. However, they occur with a higher frequency in patients with hematologic diseases. [9, 16, 36, 58, 59] Immune thrombocytopenic purpura (ITP) stands out amongst these illnesses, and a detailed identification of these foci is extremely necessary to guarantee the therapeutic success. [16, 19, 23, 35, 47, 52.]

ITP is an auto-immune disorder that promotes an accelerated phagocytosis of platelets by the reticuloendothelial system, mainly in the spleen. It frequently manifests with spontaneous bleeding. ITP affects both children and adults, with different manifestations and evolution. In children, it typically presents with the sudden onset of petechiae and has a favorable outcome. In the meanwhile, ITP in adults occurs with insidious onset and trends to become a chronic disease. [3, 8, 14, 18, 41]

The diagnosis of immune thrombocytopenic purpura is an exclusion diagnosis. It must be moved away secondary causes, like forms in association with systemic erythematosus, the antiphospholipid syndrome, immunodeficiency states, lymphoproliferative disorders, infections like immunodeficiency virus and hepatitis C virus and therapy with drugs such as heparin and quinidine. [1,8, 46] In adults patients, treatment praises the use of oral prednisone (1.0-1.5 mg/kg/d), mainly in the acute forms. Another therapeutics agents like azatioprine and cyclophosphamide are also indicated.

Nevertheless, rates of complete and draw out remission with drugs are low (around 25%). By contrast, splenectomy promotes permanent remission in more than 70% of the cases, becoming the treatment of choice. [1, 4, 11, 15, 23, 27, 32, 41, 44, 46]

Laparoscopic access for splenectomy was first performed by Delaitre [11] and Maignen [11] in 1991. Since then, laparoscopic techniques has been preferred for resulting in less postoperative pain, reduced degree of respiratory function, reduced length of hospital stay and earlier return to daily activities. [5, 14, 20, 38, 39,44, 50]

Several studies suggest that laparoscopy also produces less inflammatory response to surgical trauma when compared to conventional splenectomy. In addition, complications after the laparoscopic procedure are less common and complex. The main complications described are cerotic collections, intrabdominal hematoma and pleural effusion. However, complications such as hepatic abscess, bleeding and pulmonary embolism are more frequent in conventional procedures. [2, 4, 7, 23, 28, 30, 32, 33, 50] In spite of the innumerable advantages of videolaparoscopy, factors such as surgeons' experience, spleen's size and obesity restrict the effectiveness of the splenectomy . [20, 37, 40, 46, 51]

Amongst the cases of failure in surgical treatment, it is described the finding of functional splenic tissue due to the presence of accessory spleen. Nowadays, surgeons dispose of Computed Tomography (CT) and Scintilography for preoperative identification of these structures. However, both exams may fail, so it is crucial that the surgeon pursues accessories spleens during the surgical act. [19, 35, 11, 15] According to these data, the present study aims to analyze the effectiveness of laparoscopy in investigating the presence of accessories spleens.

2. METHODS

During a 5-year period, 37 patients with hematologic disease and indication for elective splenectomy underwent surgery at Hospital Municipal Lourenço Jorge and Hospital das Clínicas de Teresópolis (HCTCO-FESO), Rio de Janeiro and they were prospectively documented. The standardization of the technique with completely lateral approach, using three trocars, bipolar coagulation and simple nonabsorbable ligatures spared the use of endoclips, vascular staplers and alternative energy sources, and it was the pattern of the procedure.

Surgical Technique

The patient is placed in full right lateral decubitus position setting the body in jack-knife position and 15º Tredenlemburg. Vesical and orogastric catheters are placed. Surgeon and first auxiliary (camera) place themselves in front of the patient, while the equipment stays on the back of the patient. [12]

An incision of 1cm is made in the line of left nipple, about 10 cm under the costal margin, to insert the first trocar. Reaching the peritoneum, repair wires are placed in order to avoid leakage and allow the placement of a 10 mm trocar that is placed under direct vision. The pneumoperitoneum was created through this 10 mm trocar, always using pressure of less than 12 mmHg, in order to prevent metabolic and hemodynamic changes. Another 10 mm trocar was placed 10 cm to the right of the first trocar, often corresponding to the medium axilar line. Scissors, bipolar scalpel, aspirator and endoclips are used preferably by this port, as well as the withdrawal of the specimen, after enlargement of the incision from 2 to 3 cm. The third trocar (5 mm) was placed below and to the right from xyphoid appendix, serving to the left-hand instrument of the surgeon.

After the trocars were placed, adhesiolysis was made. Even if the patient did not have previous history of surgery this step is necessary, in order to detach splenic flexure, and avoid inadvertent injuries by electric current. A detailed investigation is made, delimitating the presence of accessory spleens, as well as concurrent abnormalities. The inspection starts at the jejunum and ileum, passing to the transverse colon, mesentery, stomach, shorts vessels, splenocolic ligament and splenic hilum, the three last ones correspond to the most frequent sites (Figure 1A-1D). Accessory spleens were found in 31.8% of our casuistic, they had been dried up at the beginning of the surgery, before the extraction of the organ. In most cases, the tissue's extraction (spleen and accessory spleen) has succeeded through the 10 mm trocar, using sealed plastic bag easily found in supermarkets (Ziploc™) and sterilized through ethylene oxide process. Fascial closure of 10mm wounds were performed using Vicryl 0. Patients were given oral intake on the same operative day.

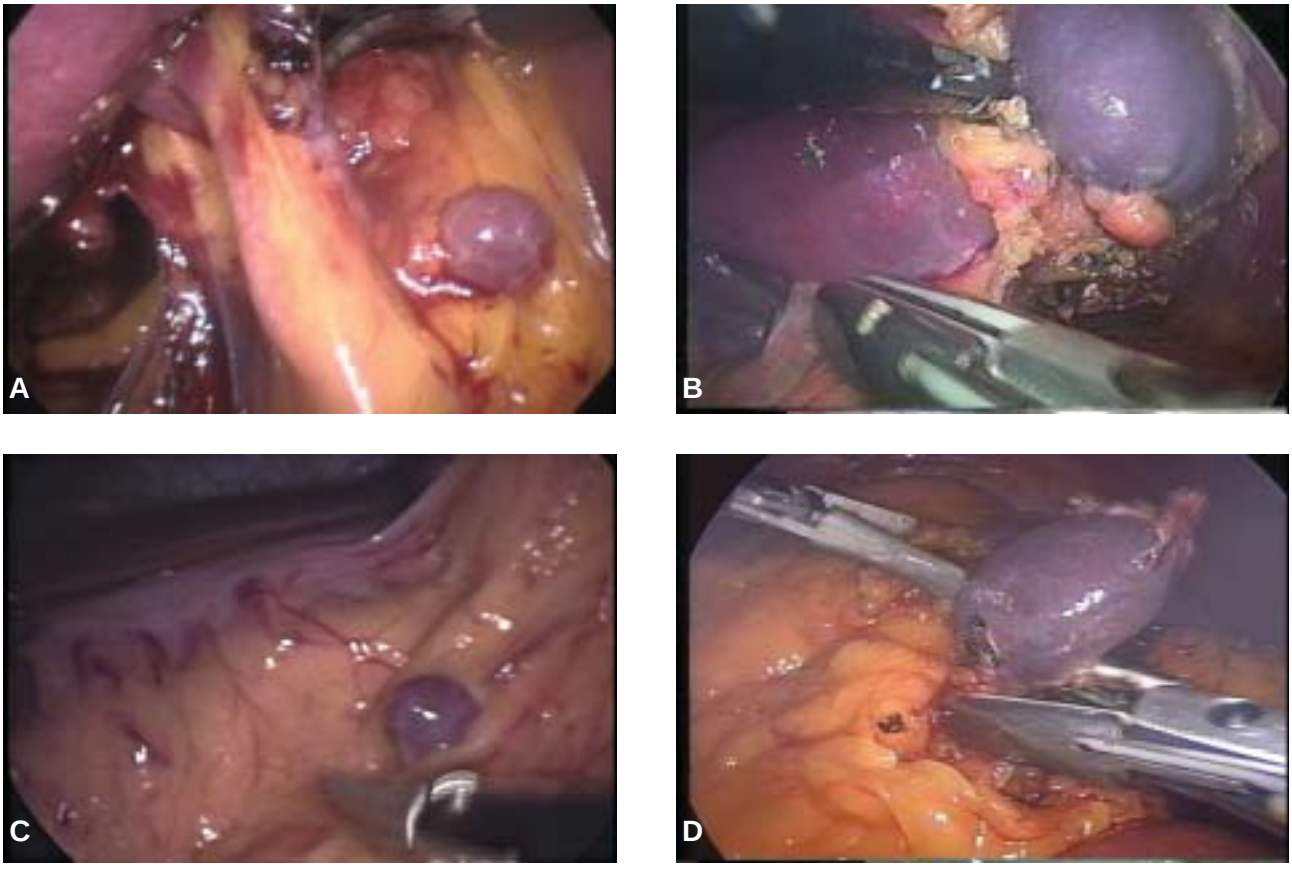

Figure 1 - *Common sites of accessory spleens found at laparoscopic splenectomy for ITP. 1A. Inferior polar artery location. 1B. Splenic hilum. 1C. Major omentum. 1D. Splenocolonic attachment.*

3. RESULTS

Accessory spleens were found in eleven cases, which means 29.7% (11/37). However, neither preoperative ultrasonography was capable to detect their presence in none of these cases where they were present, nor preoperative CT could report their presence in only one case (6cm accessory spleen). Of these, 3 had been found next to the inferior polar artery, one next to the short gastric vessels, two next to splenic hylum and one in the larger omentum. The greatest of them, 6 cm of diameter, was removed together with the spleen at the end of the surgery. It was necessary an additional 5 mm trocar in 8 patients (20.52%), usually in the left flank, allowing best exposition of the superior pole of the spleen.

Eight patients (21.6%) needed blood transfusion during the surgery or in the postoperative period. These patients represent cases where it was necessary to stabilize low platelets during the procedure when an intense bleeding occurred, even when using electrocoagulation and careful dissection. Mean estimated blood loss was 98.25 ml, varying from 20 to 400 ml, in which the highest loss of blood (400ml) was the only case of conversion in the casuistic. In this case, after the control of all the vessels and complete mobilization of the organ, the untied region kept blood; therefore, it was necessary conversion to achieve hemostasis. This patient also failed the clinical response of splenectomy to control ITP, keeping low platelets even with elevated doses of steroids.

Three patients suffered laceration of capsule during the surgery. In two cases there was rupture of the plastic bag, thus another bag was necessary with new positioning of the spleen for its extraction. Both patients had good evolution during the postoperative time. The average length of hospital stay was 2.41 days (varying of 2 to 6 days). The patients had been seen regularly in ambulatory, with an average follow-up time of 12.9 months. Of the 37 patients with ITP, 27 (72.9%) had satisfactory response with significant increase of platelets.

Fewer complications occurred in 6 of 37 patients (16.2%). Two patients developed subcutaneous hematoma on the left flank, with spontaneous resolution, one of them presented small pleural effusion that did not need draining, another one developed with fecaloma on the fourth postoperative day. A patient developed pain on left flank 18 months after surgery, the presence of remaining spleen tissue was diagnosed by CT scan, but with complete remission of ITP, the patient was submitted to open surgery. The last patient with lumbar pain 26 months after surgery underwent a CT exam that revealed a pancreatic tail pseudocyst, which was treated conservatively. Neither infection of the wound nor pneumonia due to the procedure was observed. It was not observed death, as well as major complications.

4. DISCUSSION

Many aspects of understanding spleen disease have changed since KAZNELSON, a medical student from Praga, reported for the first time a therapeutic splenectomy for ITP in 1916 [26]. The advent of minimum invasive surgery, and thereupon its application for splenectomy by DELAITRE e MAIGNIEN [11] in 1991 have resulted in the necessity to increase casuistry and prospective studies to establish the real role of the method. Descriptions of initial experiences have been published by DEXTER e cols.[13], LEFOR e cols.[31], ZORNIG e cols.[57] e PHILIPS e cols.[40], among others, showing the feasibility and safety of the method, little by little replacing open surgery mainly in big centers with higher numbers of patients. Nowadays, this procedure represents the golden standard method for hematologic disease's treatment with indication to splenectomy.

GAGNER [17] has instituted lateral decubitus and lateral approach as a routine for videolaparoscopic adrenalectomy, which smoothed away difficulties for identifying and dissecting the structures in adrenalectomy, as well as in splenectomy when this knowledge was applied by other surgeons [21, 27, 43, 47]. TRIAS [54] has compared the lateral approach to the anterior approach, emphasizing the advantages of the first one that allows shorter the operative time as well as numbers of trocars. The position in lateral decubitus made spleen pendency possible due to gravity, thus it was not necessary great manipulation of the organ and removal of adjacent organs. Placing the patient in this way makes the use of two additional trocars not necessary.

The possibility to perform videolaparoscopic splenectomy using only three trocars was proposed initially by GOSSOT [21], SZOLD 48 and TRIAS [54], with few changes of positioning and approach, but always using laparoscopic vascular staplers [6, 10, 59] In our experience, great part of the vessels were stamped by bipolar electrocoagulation, the splenic hilum was criteriously sectioned after performing a double tie with nonabsorbable wire (polypropylene) through knot or suture. Operative bleeding did not occur. None of the patients were submitted to another surgery because of postoperative bleeding.

Accessory spleens are found in 10% of general population, besides in patients with hematologic diseases these congenital abnormalities could be detected in 30% of the cases which were submitted to splenectomy. [8, 18, 35, 58] In some ITP cases, to not locate these structures may result in splenosis and failure of the surgical therapeutic. Hence it follows that complete removal of splenic tissue is essential, and for this a diligent inventory in searching the splenic tissue must be made as a routine before beginning dissection. The splenic hilum, major and minor omentum and splenocolic ligaments can be effectively evaluated. An adequate investigation must disclose any ectopic splenic tissue. In our casuistry, the rate detection was of 29.7%.

Computed Tomography (CT) does not seem mandatory for pre-operative detection of accessory spleen. Typically, these structures appears as delimited and small masses (< 2cm) with homogeneous aspect to the contrasted exam. MORTELE et al have shown that the most frequent location of accessory spleen is: postero-medial spleen zone, antero-lateral zone near the superior pole of left kidney and lateral, superior and posterior zones of the tail of the pancreas. GIGOT and cols. in study a comparing per operative CT and Scintilography with laparoscopic exploration reported that both exams can detect accessory spleens in 25% of the cases, while laparoscopic investigation shows an accuracy of 75% in detection of accessory spleens.

STANECK [45] and cols have mentioned an identification rate of 43% with CT, and they have assigned this increase to the use of equipment with higher resolution.

CT and Scintilography are crucial for the identification of these abnormalities, although they are less accurate than the laparoscopic approach.

Therefore, several authors have reported an increased difficulty in identifying accessory spleens during the surgery, when these were not demonstrated by imaging exams. [19, 36, 47, 52]

Despite these unsatisfactory rates of preoperative detection, the laparoscopic inventory is decisive to assure that any residual splenic tissue persists after splenectomy.

TARGARONA [50] and SZOLD [47] have reported that the "main-point" to assure identification by laparoscopic approach is excising the accessory tissue before performing the splenectomy. These authors have shown that an identification of accessory spleens is easier when the anatomy is preserved. PARK [38] and cols affirm that the lateral approach could be harmful in the identification of accessory tissue, a time that this technique would make difficult the access to the places where these abnormalities more frequently occur. However, our experience does not corroborate such affirmation, and other approaches have been deferred due to the several advantages that have already been exposed with splenectomy in the lateral decubitus position. [17, 21, 27, 49, 53, 55, 56]

Some studies have reported higher rate of detection through conventional splenectomy. In our opinion, there is no sense in preferring conventional surgery even if these data were true. However, we stand out that many other studies does not support this affirmation; therefore, it is doubtful to attribute this advantage to conventional surgery. [19, 36, 52]

5. CONCLUSIONS

Laparoscopic splenectomy has become the procedure of choice for elective splenectomy because of their feasibility and safety. Compared to the conventional technique, videolaparoscopy presents less morbidity rate, less postoperative pain, reduce length of hospital stay and fast return to daily activities. Despite of the several advantages of videolaparoscopy, some factors such as surgeons' experience, spleen's size and obesity restrict the effectiveness of the splenectomy. Several studies report that ITP is the most frequent indication for elective splenectomy, and in 20% of these patients accessory spleens are present.

Detection of accessory spleens is still a challenge for surgeons, and it certainly is the main cause of failure in the surgical treatment for ITP. Improvements are necessary to reach better rates of identification of this embryologic disorder. However, several data demonstrate that unquestionably videolaparoscopy is the way to reach this objective.

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