

Laparoscopic partial splenectomy: Our series of 3 patients

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ABSTRACT

Total splenectomy can cause many perioperative and postoperative complications. Partial splenectomy has been preferred in recent years in order to minimize the immunological complications associated with splenectomy. With this case series, we aim to present our own experiences with 3 patients.

Keywords: Laparoscopic; partial; splenectomy.

Introduction

Total splenectomy (TS) causes many perioperative and postoperative complications. The main ones are infection, intraabdominal abscess, portal vein thrombosis, pulmonary hypertension, thrombocytosis, and venous thromboembolism.^[1,2] In addition to these complications, increased susceptibility to encapsulated bacterial infections (4%) is seen with the disappearance of splenic functions.^[3] These complications and risks have brought to mind the question of “Can surgical treatment be performed by partial resection?” Although the first partial splenectomy (PS) was performed in 1959, the laparoscopic procedure was first performed in 1995.^[4] However, there is not enough data in the literature to compare the minimal-invasive method and the open method.

Our aim in sharing this case series is to present three patients who underwent laparoscopic PS for benign reasons.

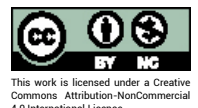
Case Report

Two of our patients were male (66%) and the median age was 17 (17–26). After the malignancy was ruled out with preoperative imaging methods, laparoscopic PS was planned. Blood tests were normal during preoperative evaluations. All patients were evaluated as ASA 1 according to the American Society of Anesthesiologists Scoring. There were no previous abdominal operations in the medical histories of the patients. Median operation time was 120 min (120–150) and bleeding amount was 40 ml (10–100). Conversion to open approach or TS was not required in any operation. The oral intake time of all patients was 1st postoperative day, the abdominal drains were removed on the 2nd day and discharged on the 4th day. Pathology results of the patients; hemangioendothelioma, epithelial cyst, and pseudocyst. The mean mass size was 8.56 cm (5.7–14). No complications were encountered during the median follow-up of 22 months (22–25).



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Surgical Technique

The patients were operated under general anesthesia by placing four trocars (2 × 5 mm–2 × 10 mm) in the right flank position. The area to be resected was freed from adjacent tissues with ligasure (5 mm; Medtronic, Covidien products, Minneapolis, MN). Then the artery and vein leading to the resection area were found. The spleen was released from the lateral peritoneum. The artery to be closed for resection was found and clipped. The demarcation line in the splenic parenchyma was seen and marked with cautery (Fig. 1). Then the main splenic artery was dissected and a pringle maneuver was performed. Parenchyma dissection was performed with ligasure (5 mm-Covidien) from the demarcation line (Fig. 2). Then the splenic vein to be resected was clipped and cut. After the parenchyma was completely detached, the resected fragment was placed in the endobag. The endobag was removed from the 10 mm trocar area on the left anterior axillary line with an ovarian clamp. The operation was completed by placing a drain in the splenic lodge.



Figure 1. Demarcation line on the splenic surface.



Figure 2. Parenchyma dissection from demarcation line.

Discussion

TS, which is widely used in splenic pathologies, brings along fears of decreased immunological response and associated susceptibility to encapsulated bacterial infection. Spleen, it plays important role in the phagocytic activity of macrophages, in the synthesis of anti-polysaccharide antibodies by splenic B lymphocytes, and in defense against infections. The prevalence of overwhelming post-splenectomy infection after TS is about 4% and the overall mortality is 2%. Some studies have shown that the preservation of 25–30% of the splenic parenchyma is sufficient to provide a satisfactory immunological response to an antigenic stimulus.^[3,5] This notion has suggested PS. Although the concept of PS was first applied in the second half of the 20th century, the first partial laparoscopic splenectomy was performed in 1995.^[4] PS indications include splenic cystic diseases, hematological diseases, splenic trauma, and benign splenic tumors.^[6] With the use of minimally invasive methods, decrease in hospitalization time, return to early work life and decrease in wound complications are expected advantages. However, in addition to these advantages, it was observed that the operation time was extended, morbidity, and conversion to TS increased.^[7] The reason for this is that it does not receive enough attention and consequently, there is no increase in experience.

The biggest fear in laparoscopic surgery is the inability to control bleeding. Although some confidence has been provided with technological developments and equipment increase, the desired reduction in conversion rates and conversion rates to TS compared to open surgery has not been achieved. Generally, the conversion rate to open surgery is 3% and the most common causes are bleeding and adhesions. The conversion rate of PS to TS is 3.5%.^[8] Preoperative embolization and peroperative demarcation line resection are the techniques used to reduce the amount of bleeding.^[9,10] A bipolar irrigated sealer, hemostatic sponges, matrix hemostatic agents, or fibrin sealants were used to reduce bleeding from residual parenchyma but no specific studies demonstrated better efficacy.^[11] In our cases, polar arteries and veins were selectively ligated and parenchyma dissection was achieved from the demarcation line. Although preoperative embolization is thought to decrease the amount of bleeding peroperatively, abscess causes complications such as pain and nausea.^[12] However, it has been observed in experienced clinics that laparoscopic total and PS results in similar results in the operation time and the amount of bleeding.^[8]

Conclusion

Although there are not enough studies in the literature, PS is seen as a feasible method. The success of PS will become evident with the increase in the number of cases and experience.

Disclosures

Informed Consent: Written informed consent was obtained from the patient for the publication of the case report and the accompanying images.

Peer-review: Externally peer-reviewed.

Conflict of Interest: None declared.

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References

1. Rottenstreich A, Kleinstern G, Spectre G, Da'as N, Ziv E, Kalish Y. Thromboembolic events following splenectomy: risk factors, prevention, management and outcomes. *World J Surg* 2018;42:675–81.
2. de'Angelis N, Abdalla S, Lizzi V, Esposito F, Genova P, Roy L, et al. Incidence and predictors of portal and splenic vein thrombosis after pure laparoscopic splenectomy. *Surgery* 2017;162:1219–30.
3. Di Sabatino A, Carsetti R, Corazza GR. Post-splenectomy and hyposplenic states. *Lancet* 2011;378:86–97.
4. Poulin EC, Thibault C, DesCôteaux JG, Côté G. Partial laparoscopic splenectomy for trauma: technique and case report. *Surg Laparosc Endosc* 1995;5:306–10.
5. Doğan SM, Aykas A, Yücel EŞ, Okut G, Şimşek C, Çayhan K, et al. Immune profile of asplenic patients following single or double vaccine administration: A longitudinal cross-sectional study. *Ulus Cerrahi Derg* 2015;31:118–23.
6. Moris D, Dimitriou N, Griniatsos J. Laparoscopic splenectomy for benign hematological disorders in adults: a systematic review. *In Vivo* 2017;31:291–302.
7. Liu G, Fan Y. Feasibility and safety of laparoscopic partial splenectomy: a systematic review. *World J Surg* 2019;43:1505–18.
8. Esposito F, Noviello A, Moles N, Cantore N, Baiamonte M, Coppola Bottazzi E, et al. Partial splenectomy: A case series and systematic review of the literature. *Ann Hepatobiliary Pancreat Surg* 2018;22:116–27.
9. de la Villeon B, Le Bian AZ, Vuarnesson H, Bongrand NM, Halimi B, Sarfati E, et al. Laparoscopic partial splenectomy: a technical tip. *Surg Endosc* 2015;29:94–9.
10. Patrzyk M, Glitsch A, Hoene A, von Bernstorff W, Heidecke CD. Laparoscopic partial splenectomy using a detachable clamp with and without partial splenic embolisation. *Langenbeck's Arch Surg* 2011;396:397–402.
11. Stacey MJ, Rampaul RS, Rengaragan A, Duffy JP, MacMillan RD. Use of FloSeal matrix hemostatic agent in partial splenectomy after penetrating trauma. *J Trauma* 2008;64:507–8.
12. Guan YS, Hu Y. Clinical application of partial splenic embolization. *ScientificWorldJournal* 2014;2014:961345.