

Laparoscopic versus conventional splenectomy: experience in the general surgery service of the Central Hospital of the Instituto de Previsión Social

Esplenectomía laparoscópica versus convencional: experiencia en el servicio de cirugía general del Hospital Central del Instituto de Previsión Social

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ABSTRACT

Introduction: Splenectomy is indicated in the management of hematological and oncological diseases and also trauma. The objective of this study was to compare the results of conventional and laparoscopic approaches to splenectomy in a reference center. **Materials and methods:** an observational, comparative, cross-sectional study was carried out. Patients older than 16 years who underwent splenectomy in the General Surgery Service of the Social Prevention Institute between 2019 and 2021 were studied. Data were obtained from the Hospital Information System. **Results:** 112 patients were evaluated, 65% men, 35% women, with a median age of 48 years. 41% were scheduled surgeries and 59% emergencies. 93% by conventional route and 7% laparoscopic. Those with a laparoscopic approach were elective surgeries, mainly due to hematological diseases. 44% of the splenectomies were due to trauma, all by conventional approach. The rate of postoperative complications was 23% in conventional splenectomies and 12,5% in laparoscopic ones, with re-bleeding being the most frequent by conventional approach. 78% had no complications. **Conclusion:** Conventional splenectomy continues to be more frequent than laparoscopic splenectomy, which requires certain training by the surgeon, is feasible as a procedure and offers advantages in reducing complications.

Keywords: Splenectomy, Laparoscopy, Postoperative Complications.

RESUMEN

Introducción: La esplenectomía está indicada en el manejo de enfermedades hematológicas, oncológicas y también traumatismos. El objetivo de este estudio fue comparar los resultados del abordajes convencional y laparoscópico de esplenectomía en un centro de referencia. **Material y métodos:** se realizó un trabajo observacional, comparativo, de corte transversal. Se estudiaron pacientes mayores de 16 años sometidos a esplenectomía en el Servicio de Cirugía General del Instituto de Previsión Social entre 2019 y 2021. Los datos fueron obtenidos del Sistema

Informático Hospitalario. **Resultados:** Se evaluaron 112 pacientes, 65% hombres, 35% mujeres, con una mediana de edad de 48 años. 41% fueron cirugías programadas y 59% urgencias. El 93% por vía convencional y 7% laparoscópico. Las de abordaje laparoscópico fueron cirugías programadas, principalmente por enfermedades hematológicas. 44% de las esplenectomías fueron por traumatismo, todas por vía convencional. La tasa de complicaciones postoperatorias fue 23% en esplenectomías convencionales y 12,5% en laparoscópicas, siendo el resangrado la más frecuente por vía convencional. 78% no presentaron complicaciones. **Conclusión:** La esplenectomía convencional sigue siendo más frecuente que la laparoscópica, la cual requiere cierto entrenamiento por parte del cirujano, es factible como proceder y ofrece ventajas en la reducción de complicaciones.

Palabras claves: Esplenectomía, Laparoscopia, Complicaciones Postoperatorias.

INTRODUCTION

The spleen is a lymphoid organ that combines both innate and adaptive immune responses in an organized manner. Its structure allows it to perform functions such as phagocytosis of red blood cells, iron recycling, and the recognition and elimination of pathogens, granting it antibacterial and antifungal immune activity. In certain pathological conditions, there is an increased destruction of red blood cells, platelets, and white blood cells, which may necessitate surgical resection.⁽¹⁾

Splenectomy is indicated for the management of primary hematological disorders such as immune thrombocytopenic purpura (ITP), autoimmune hemolytic anemia (AIHA), hereditary spherocytosis (HS), as well as for oncological conditions like

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leukemia and lymphoma, particularly when secondary hypersplenism occurs.⁽¹⁾

Splenectomy can be performed through an open or laparoscopic approach. Over the last two decades, the laparoscopic approach has gained preference in the field of surgery. This method has demonstrated significant benefits, including a reduction in intraoperative and postoperative complications, decreased postoperative pain, reduced need for blood transfusions, and shorter hospital stays.⁽¹⁾

Despite these advantages, the choice between the two approaches depends on various factors, such as the patient's surgical history, the urgency of the surgery, the patient's hemodynamic stability, and the presence of splenomegaly. Although splenomegaly has been associated with an increased risk of intraoperative bleeding and the potential need for conversion to open surgery, it is not considered an absolute contraindication for laparoscopic splenectomy.

The General Surgery Department at the Central Hospital of Instituto de Previsión Social (HC-IPS) is a nationally recognized surgical center. In this context, the present research was conducted with the aim of comparing the outcomes between the laparoscopic and conventional approaches in splenectomy, in order to provide valuable insights for informed clinical decision-making and enhance the quality of medical care.

MATERIALS AND METHODS

An observational, comparative, retrospective, cross-sectional study was conducted, in which all patients over 16 years of age who underwent open or laparoscopic splenectomy at the HC-IPS between 2019 and 2021 were evaluated. Patients with splenic pathologies of traumatic origin, hematological disorders, and those who required splenectomy due to complications from other surgical procedures were included in the study. Data were collected from the Hospital Information System.

To obtain information related to preoperative variables (age, gender, diagnosis, nature of splenectomy), intraoperative vari-

ables (approach, complications, bleeding, drains), and postoperative variables (complications), a review of medical records, operative reports, and daily patient progress notes was conducted. This information was recorded and stored in an electronic database created using Microsoft Excel 2016. Confidentiality and privacy of patient identities were strictly maintained throughout the study.

RESULTS

During the period from 2019 to 2021, a total of 112 patients underwent surgery, with 73 males (65.2%) and 39 females (34.8%) patients. The age range was from 16 to 86 years, with a median age of 48 years. Of the surgeries, 46 (41.1%) were elective procedures, while 66 (58.9%) were performed as emergencies. In terms of surgical approach, 104 (92.9%) were performed using conventional or open approach, and 8 (7.1%) were done laparoscopically. All laparoscopic surgeries were scheduled procedures, among which 6 were diagnosed with immune thrombocytopenic purpura (ITP), 1 with abscess, and 1 with splenic cyst. Among the conventional approach surgeries, splenectomies due to trauma were more common (49 cases), followed by other causes such as pancreatic, colon, stomach surgeries, retroperitoneal tumors, and others.

The most relevant demographic and preoperative clinical characteristics based on the surgical approach are presented in **Table 1**. The surgical approach (open or laparoscopic), in relation to the type of surgery (emergency/elective), is detailed in **Table 1**. The percentage of using some form of drainage in open and laparoscopic surgeries for both emergency and elective cases is reflected in **Table 2**. Drainage was used in 80 patients (71.4%).

Postoperative complications in patients who underwent open surgery (23.1%) were higher compared to those in the laparoscopic group (12.5%). Complications included collections, abscesses, fistulas, evisceration, surgical site infections, hemoperitoneum, and a case of fecal peritonitis and hematoma. Among patients who underwent open surgery, 17 (16.3%)

Table 1. Demographic and Clinical Characteristics. Open Surgery Laparoscopic Surgery Total Demographic Characteristics.

	Open Surgery	Laparoscopic Surgery	Total
Demographics			
n (%)	104 (92,9%)	8 (7,1%)	112 (100%)
Age (range) in years	49 (17-86)	37 (16-63)	48 (16-86)
Male	72	1	73 (65,2%)
Female	32	7	39 (34,8%)
Diagnosis			
Trauma	49	0	49 (43,8%)
ITP *	7	6	13 (11,6%)
Abscess	7	1	8 (7,1%)
Splenomegaly	5	0	5 (4,5%)
Cysts	1	1	2 (1,8%)
Spleen infarction	1	0	1 (0,9%)
Other diagnoses	34	0	34 (30,3%)
Type of surgery			
Emergency	66	0	66 (58,9%)
Scheduled	38	8	46 (41,1%)

* ITP: Immune Thrombocytopenic Purpura

Table 2. Use of drains according to type of surgery and approach.

	Open Surgery	Laparoscopic Surgery	Total
Emergency surgery			
With drainage	48	0	48 (42,8%)
Without drainage	18	0	18 (16,1%)
Scheduled surgery			
With drainage	24	8	32 (28,6%)
Without drainage	14	0	14 (12,5%)
Total			
With drainage	72	8	80 (71,4%)
Without drainage	32	0	32 (28,6%)

Table 3. Complications classified by surgery approach.

	Open Surgery	Laparoscopic Surgery	Total
With complications			
Death	9	0	9 (8,0%)
Bleeding, hemoperitoneum	8	0	8 (7,1%)
Abscesses	4	0	4 (3,6%)
Evisceration	3	0	3 (2,7%)
Surgical site infection	2	0	2 (1,8%)
Fistulas	2	0	2 (1,8%)
Fecal peritonitis	2	0	2 (1,8%)
Hematoma	0	1	1 (0,9%)
Patients with complications	24 (23,1%)	1 (12,5%)	25 (22,3%)
Without complications			
Patients without complications	80 (76,9%)	7 (87,5%)	87 (77,7%)
Reintervention			
Patients who underwent reoperation	17 (16,3%)	1 (12,5%)	18 (16%)

Note: Patients had more than one complication.

required re-intervention, while in the laparoscopic group only one did (12.5%). The main reason for re-intervention in the open surgery group was hemoperitoneum and intraabdominal collection, whereas the patient who underwent re-intervention in the laparoscopic group had a hematoma in the splenic bed. Finally, there were nine deaths (8%) in the open surgery group, all of which were associated with hemodynamic compromise. The most frequent complications in each of the different surgical approaches are detailed in Table 3. A total of 87 patients (78%) did not experience any complications.

DISCUSSION

The primary indication for splenectomy in this series is spleen trauma. Splenectomy for hematologic diseases such as idiopathic thrombocytopenic purpura (refractory to medication), for example, was indicated for 13 patients (11.6%). Other indications for surgery included splenic abscess, splenic infarction, splenomegaly, among others, as reported in previous studies.⁽³⁻⁴⁾

Being a highly vascularized and fragile organ, the spleen poses a complex surgical challenge due to its anatomical position and its relationship with adjacent organs. There is a high potential for complications during splenectomy, particularly hemorrhage in patients with splenomegaly, increasing the risk

of reoperation. The findings of this study indicated a higher frequency of rebleeding in open surgery compared to laparoscopic approaches, a result consistent with those presented in other published series.⁽⁵⁻⁹⁾

Chaud, in their study involving 94 patients who underwent splenectomy, found that 16% presented pancreatic complications, mainly pancreatic fluid collections and fistulas, which did not occur in our study.¹⁰ Similarly, Kercher and Demeure had patients with septic collections in the surgical area, coinciding with our study.⁽¹¹⁻¹²⁾

In their study, Feldman et al. mentioned that spleens with sizes between 15-25 cm due to splenomegaly can be removed laparoscopically but with a higher risk of bleeding and conversion to open surgery.⁽¹³⁾ The researchers in this study believe that laparoscopic approach should be attempted in such cases when the surgical technique is well-mastered and suitable instruments are available; otherwise, conventional splenectomy is advisable. It should be noted that technically, placing the spleen in the extraction device, macerating it, and, if unsuccessful, making incisions in less visible sites, which need to be adjusted to its size to prevent rupture, can be challenging.

Some authors define the learning curve as a decrease in surgery time or a decrease in complication rates that can be achieved after a minimum of 20 procedures.⁽¹⁴⁻¹⁵⁾ The latter oc-

curred in this study, as the frequency of postoperative complications was lower in the laparoscopic group (12.5%) compared to the open approach group (23.1%). These rates are higher than those published in a meta-analysis of 508 laparoscopic splenectomies in the pediatric population, where the rate of postoperative complications was 9.4%¹⁶; however, they are slightly lower than those reported by Winslow and Brunt in a subsequent meta-analysis that included 25 studies (2119 laparoscopic splenectomies and 821 open ones), with documented rates of postoperative complications of 15.5% for laparoscopic and 26.6% for open approaches.⁽⁷⁾ Among patients with complications in the open group, 17 patients (16.3%) required re-intervention compared to 1 patient (12.5%) needing re-intervention in the laparoscopic surgery group.

Regarding the learning curve, Dagash et al. state that there is no specific minimum number of procedures required to achieve mastery in an advanced laparoscopic technique.⁽¹⁷⁾ To develop a learning curve without major complications and achieve standardization of the technique, caution should be exercised in patient selection.⁽⁵⁾

It's important to consider that the HC-IPS is a teaching hospital with a General Surgery postgraduate program, and the group of surgeons involved in the study has training and experience primarily in open splenectomy. The learning curve for laparoscopic splenectomy is still in its early stages but is increasing as more training is provided to the medical staff.

CONCLUSION

Conventional splenectomy remains more common than laparoscopic splenectomy, considering that the primary cause of splenectomies is emergency surgery for blunt abdominal trauma. Both approaches have a significant rate of complications. Laparoscopic splenectomy requires specific training on the part of the surgeon, is a feasible procedure, and offers advantages such as a reduction in the number of complications. It also presents benefits over the conventional approach in the management of hematologic diseases, particularly in terms of intraoperative bleeding.

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