



# Does laparoscopy make splenectomy a safe ambulatory operation? Preliminary results

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## Abstract

Our aim is to explore the feasibility of ambulatory laparoscopic splenectomy. Of 11 patients, five were not suitable for ambulatory care. Of the remaining six, four (67%) were successfully completed on an ambulatory basis. Two patients (33%) required admission to hospital, one for pain control and one because of oozing with a low platelet count. Both were discharged well the next morning. One of the ambulatory patients developed a splenic bed hematoma, treated symptomatically as an outpatient. This early experience suggests that laparoscopic splenectomy can be a safe ambulatory operation. © 1999 Elsevier Science B.V. All rights reserved.

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## 1. Introduction

Since its first description in 1992 [1], laparoscopic splenectomy has been shown to have the same advantages over open surgery that have been demonstrated for other laparoscopic procedures: less discomfort, shorter hospital stay, earlier return to regular activities and lessened hospital cost [2,3]. Description of the right lateral position [4] and development of ultrasonic scissors [5] have made laparoscopic splenectomy technically easier to perform. Although increased experience has allowed extension of the technique to large spleens [6], the commonest indication remains idiopathic thrombocytopenic purpura with its normal sized spleen. Some authors suggest laparoscopy may promote splenosis or missed accessory spleens [7–9], but recent follow-up studies show results comparable to those seen with open surgery [2,10–12].

The current trend toward ambulatory surgery has been helped by laparoscopy, which has enabled many operations, hitherto requiring hospital care, to be done on an ambulatory basis. Thus, in our hospital, use of

laparoscopy has made appendectomy, even when ruptured [13], inguinal hernia repair [14], incisional hernia repair [15], cholecystectomy [16,17] and Nissen fundoplication [18] all outpatient procedures. Our first laparoscopic splenectomy was done in 1995; the patient was admitted to hospital overnight. Because he exhibited minimal disturbance to homeostasis, similar to our experience with other laparoscopic operations now done routinely on an outpatient basis, we decided to assess the feasibility of adding laparoscopic splenectomy to our regimen of ambulatory surgery. This communication describes our preliminary experience with this approach.

## 2. Methods

Patient data were entered prospectively and all elective splenectomies done between 1995 and 1998, inclusively, at the Salvation Army Scarborough Grace Hospital, a 228-bed non-teaching acute care community hospital, were analyzed. Since 1995, all elective splenectomies were booked for laparoscopic surgery and after the first operation all were considered for ambulatory surgery. Apart from the first patient, patients were excluded from the ambulatory program if an abdomi-

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nal incision had to be made, either to retrieve an intact spleen for pathology purposes, or because of conversion to open surgery. All patients were referred for surgery by the same hematologist (L.G.) and all operations done by the same surgeon (J.J.), assisted by the senior author (A.V.). Operations were done in the right lateral position, gently flexing the kidney bar to drop the iliac crest and lengthen the loin space. Initially splenic vessels were secured with clips, then with the use of endovascular stapling devices and lately with a combination of clips and ultrasonic scissors. Hemoglobin and platelet count were determined postoperatively, patients were assessed by the hematologist and criteria for discharge determined by the day surgery nurse in accordance with previously published guidelines for laparoscopic day surgery patients [19].

### 3. Results

Eleven operations were done in the 4 years under study. Idiopathic thrombocytopenic purpura (ITP) was the indication for surgery in six. The other five were done for hemolytic anemia, Felty's syndrome, spherocytosis, lymphoma and an as yet undefined myeloproliferative condition. Accessory spleens were found in two patients. Eight patients were taking steroids at the time of surgery. There were no platelet transfusions. Three patients had significant blood loss (over 250 ml) and one needed transfusion of 750 ml of packed cells. There was a clear, although statistically non-significant, difference in the preoperative hemoglobin and platelet values for ITP and non-ITP patients. Average hemoglobin for ITP patients was 147 g per 100 ml (121–170) and average platelet count  $70 \times 10^9$  (2–211) per ml. For non-ITP patients these values were 90 (56–102) and 155 (8–225), respectively; 4–12 h postoperatively hemoglobin fell an average of 18 g per 100 ml and platelets rose an average of  $6 \times 10^9$  per ml. These changes from preoperative levels did not achieve statistical significance and were not significantly different for ITP and non-ITP patients or for ambulatory and non-ambulatory patients. Average hospital stay for the non-ambulatory patients was 4 days, average age 54 years and average operative time 171 min. An average of 4 months (range 1–8) after surgery, platelet counts for ITP patients had risen an average of 246%, from  $70 \times 10^9$  to  $242 \times 10^9$ . There have been no late relapses since and no patient has needed steroids to maintain the effect.

The first patient, as mentioned, was not considered for ambulatory surgery. Of the remaining ten patients, two were excluded because an intact spleen was required by the pathologist, necessitating an abdominal incision (Pfannenstiel in both cases). An additional two were excluded because of conversion to open

surgery (one for a huge spleen due to lymphoma and one to control major bleeding from a technical mishap). The remaining six patients were all managed as ambulatory surgery patients. Average age was 44 years (18–71) and five were females. American Society of Anesthesiologists Physical Status (PS) Classification assigned by the anesthesiologist was PS1 (1), PS2 (3), PS3 (1) and PS4 (1). Diagnosis for these patients was ITP (3), spherocytosis (1), Felty's syndrome (1) and hemolytic anemia (1). Average operative time was 128 min (101–180).

Of the six outpatients, two (33%) required admission. One was admitted for pain control and one was admitted for precautionary observation because of oozing throughout the operation in the presence of a low platelet count. Both patients were sent home without problems the following morning. The other four patients (67%) were discharged without mishap the day of surgery. One of them returned to emergency with left upper quadrant pain 24 h after surgery and 4 days later was found on ultrasound to have a splenic bed hematoma the size of the removed spleen. By then the hemoglobin had dropped from 130 to 90, but since she was hemodynamically stable she was treated expectantly as an outpatient with eventual resolution of both symptoms and hematoma.

### 4. Discussion

Our experience suggests that 67% of suitable patients undergoing laparoscopic splenectomy can be treated on an ambulatory basis. In retrospect our first patient as well as the two patients admitted could have been treated on an ambulatory basis. However, even if we had had a 100% rate of ambulatory care, a series of seven patients would not be enough to draw reliable conclusions. For this reason our experience must be considered preliminary only. We offer it for publication at this preliminary stage for two reasons. Firstly, since we work in a small hospital where elective splenectomy is not a common procedure, time to accumulate sufficient experience may make a definitive report practically unachievable. We put our data forth in the hope that they may encourage colleagues with larger volumes to explore the concept.

The second, and weightier reason we suggest our small experience may reflect reality derives from our wide experience with ambulatory laparoscopic surgery for a variety of other operations of approximately the same magnitude, which heretofore required inpatient treatment. The response of our splenectomy patients to laparoscopic intervention was so similar to all our other ambulatory patients that similar ambulatory treatment seemed reasonable. We are encouraged that our early experience has indeed confirmed this expectation.

Laparoscopic splenectomy is not characterized by excessive postoperative pain or interruption of intestinal function, either of which may require hospital care. With respect to the laparoscopic approach, a major concern has been the ability to detect and remove accessory spleens and to avoid splenosis by breaking the capsule. In our series there has been no instance of spilling splenic pulp. Two patients were found to have accessory spleens, which were successfully removed. This corresponds to the reported incidence of 15–20% [20] and suggests laparoscopy can deal successfully with this eventuality. At four months platelets have risen 246% without having to use steroids for any patient and there have been no relapses to date. This suggests laparoscopy is equivalent to open splenectomy for managing ITP, as reported by Lozano-Salazar et al. [11].

With respect to ambulatory treatment, the major concern with splenectomy is the risk of bleeding. Clearly immaculate hemostasis is required in this operation. If operative hemostasis is secure, significant postoperative bleeding should not occur. If it were to occur, massive bleeding from a major vein or significant artery should induce sufficient hemodynamic instability that early signs should become evident long before the patient is ready for discharge from the day surgery unit (usually about 4–6 h postoperatively). Oozing or smaller vessel bleeding may indeed go undetected, as happened to one of our patients, but such bleeding should not be life threatening, should allow ample time for the patient to return and should rarely require intervention.

Our experience suggests that postoperative hemoglobin and platelet levels change so little from preoperative levels that they do not seem to be reliable guidelines for safe discharge. For ITP patients, platelet counts rise rapidly but significant elevation is not detected before 24 h. In the immediate postoperative state the average elevation is only  $6 \times 10^9$  per ml. Average hemoglobin drop was 8%, well within the range one might expect from the combination of 'normal' operative blood loss and hemodilution by aggressive intraoperative crystalloid infusion. Thus, although serial hematologic monitoring may be thought to be prudent before same-day discharge, careful monitoring of vital signs remains the most reliable detector of problems that may preclude safe discharge. Because of the vast experience with such monitoring in our unit with other operations of similar or greater magnitude, we feel confident that for splenectomy, as for other conditions [21,22], instability requiring further attention will be detected during postoperative observation and patients who remain stable during observation do not decompensate later. Our preliminary results suggest that this may indeed be true, but larger numbers are needed for confirmation.

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