Safety of Laparoscopic Ventral Hernia Repair in Octogenarians

Andrew L. Blount, MD, Randall O. Craft, MD, Kristi L. Harold, MD

ABSTRACT

Background and Objectives: The recurrence rate after laparoscopic ventral hernia repair is lower than the rate of recurrence via the open approach in many series. Studies have demonstrated the safety and efficacy of this procedure but have had relatively young patient populations. We present our experience in a significantly older population.

Methods: A retrospective chart review of all patients 80 to 89 years of age undergoing a laparoscopic ventral hernia repair at our institution from May 2000 to June 2007 was performed. Data collected included demographics, number and type of previous abdominal operations, number of previous hernia repairs, defect and mesh size, postoperative complications, and follow-up.

Results: Twenty octogenarian patients underwent laparoscopic ventral hernia repair. Nine were men and 11 were women. The mean age was 82 years. Thirteen patients (65%) had one or more associated comorbidities at the time of surgery. Eighteen patients (90%) had undergone a mean of 1.7 prior abdominal operations. Six (30%) patients had undergone a mean of 1.1 previous open hernia repairs; 5 (83%) with mesh. Eight patients (40%) had an additional operative procedure at the time of laparoscopic hernia repair. Ten minor complications occurred in 10 patients (50%). Four major complications occurred in 4 patients (20%). One patient required reoperation for evacuation of hematoma at a trocar site. No patients complained of pain at a transabdominal suture site or persistent seromas by 6 weeks of follow-up. At mean follow-up of 3.1 months, no recurrences occurred and no patients required mesh removal in this series. No deaths occurred.

Conclusion: Laparoscopic ventral hernia repair is becoming an accepted technique for hernia repair in the United States, with a well-documented low recurrence rate. Our series demonstrates that this approach is equally safe and effective for a significantly older segment of the population.

Key Words: Ventral hernia, Elderly, Laparoscopy, Complications.

INTRODUCTION

Ventral hernia formation is one of the most common long-term complications of laparotomy, with a reported incidence of 3% to 20%.1,2 Further, it is estimated that an additional 5% of the United States population has an umbilical or epigastric hernia.3 It is therefore not surprising that approximately 90 000 ventral hernia repairs are performed annually.4 Comparison studies have demonstrated the superiority of mesh repairs over primary closure, with reported recurrence rates of 11% to 21% and 25% to 52%, respectively.5 Unfortunately, open mesh repair carries a significant complication rate of 14% to 50%, which is mainly attributed to wound complications.6 Laparoscopic ventral hernia repair (LVHR) has dramatically improved in the last decade, with considerable improvements in recurrence, length of stay, and complication rates7 compared with those in open repair with prosthetic mesh.1,6,8–10 Multiple studies have evaluated complication rates of LVHR based on variables like previous number of repairs, BMI, and the size of the defect.6,7,11 However, only a paucity of studies have specifically looked at advanced age as a factor affecting outcomes and complications of LVHR, with the average age of most studies reported as 54 years (range, 46 to 59).1,2,5 We are aware of only 3 studies that have patient populations with an average age over 60.12–14 With ever-increasing life expectancy, surgeons are encountering increasing numbers of very elderly patients. Accordingly, the purpose of this study was to evaluate the short-term outcomes and safety after LVHR in the octogenarian population.

MATERIALS AND METHODS

A retrospective chart review of all patients 80 to 89 years of age undergoing a laparoscopic ventral hernia repair at our institution from May 2000 to June 2007 was per-
formed. Data collected included patient demographics, number and type of previous abdominal operations, number of previous hernia repairs, defect and mesh size, postoperative complications, and follow-up. Our technique of repair is similar to that described by Heniford. Postoperative complications were divided into minor (urinary retention, urinary tract infection, pneumonia/atelectasis, ileus longer than 4 days, wound infection, hematoma, clostridium difficile colitis, and cellulitis requiring antibiotics) and major (reoperation, cardiac, unrecognized bowel perforation, small-bowel obstruction, pulmonary embolism, pain duration >6 weeks, pain requiring injection, seroma duration >6 weeks, recurrence of hernia).

RESULTS

Patient Characteristics

Twenty octogenarian patients underwent laparoscopic ventral hernia repair. Nine were men (45%) and 11 were women (55%). The mean age was 82 years (range, 80 to 89). Mean BMI was 29.35 (range, 21.2 to 43.8). Six patients (30%) had an ASA score of 2, and 14 (30%) had an ASA of 3. Thirteen patients (65%) had one or more associated comorbidities at the time of surgery, including hypertension in 10 (50%), chronic obstructive pulmonary disease in 5 (25%), coronary artery disease in 4 (20%), type II diabetes mellitus in 2 (10%), peripheral vascular disease in 1 (5%), and chronic renal failure in 1 (5%). None were active smokers. Eighteen patients (90%) had undergone a mean of 1.7 prior abdominal operations. These operations included 12 patients (60%) undergoing gastrointestinal procedures, 6 (30%) undergoing hepatobiliary procedures, 5 (25%) undergoing gynecologic procedures, 3 (15%) undergoing endocrine procedures, 2 (10%) undergoing urologic procedures, and 1 (5%) undergoing a vascular procedure. Additionally, 6 (30%) patients had undergone a mean of 1.1 previous open hernia repairs; 5 (83%) with mesh.

Operative Findings

All procedures were completed laparoscopically. Defects ranged in size from 12 cm² to 750 cm² (mean, 157 cm²). Mesh sizes ranged from 120 cm² to 884 cm² (mean, 366 cm²). The average operating time was 154.75 minutes (range, 37 to 348). The average blood loss was 31.2 mL (range, 7 to 100). Incarcerated contents were discovered in 10 hernias (50%) including the following: 25% omentum, 25% small bowel, 5% colon, and 1% fat. Eight patients (40%) had an additional operative procedure at the time of laparoscopic hernia repair. These included 3 inguinal hernia repairs (15%) and 1 (5%) each of the following: laparoscopic spigelian hernia repair, laparoscopic paraesophageal hernia repair, laparoscopic femoral hernia repair, urethrotomy of urethral stricture, and excision of neck tissue (cosmetic).

Postoperative Complications and Follow-up

The mean length of stay was 4.8 days (range, 0 to 9). Mean follow-up was 3 months (range, 2 to 1063 days). Complications are listed in Table 1. Ten minor complications occurred in 10 patients (50%). Four major complications occurred in 4 patients (20%). Of the minor complications, 5 (50%) were due to urinary retention. Of the major complications, 2 (50%) were cardiac, with one patient having atrial fibrillation and another having an antero-septal myocardial infarction that was medically managed. One (5%) patient developed a small-bowel obstruction that resolved with nonoperative management. One (5%) patient had atrial fibrillation, and another had an antero-septal myocardial infarction that was medically managed.

Table 1.

| Complications                        | Number of Occurrences, n (%) |
|--------------------------------------|------------------------------|
| Minor                                |                              |
| Urinary Retention                    | 5 (25%)                      |
| UTT                                  | 0                            |
| Pneumonia/atelectasis                | 2 (10%)                      |
| Ileus > 4 days                       | 1 (5%)                       |
| Wound Infection                      | 0                            |
| Hematoma                             | 1 (5%)                       |
| C. difficile colitis                  | 0                            |
| Cellulitis requiring antibiotics     | 1 (5%)                       |
| Major                                |                              |
| Reoperation                          | 1 (5%)                       |
| Cardiac*                             | 2 (10%)*                     |
| Unrecognized Bowel Perforation       | 0                            |
| Small Bowel Obstruction              | 1 (5%)                       |
| Pulmonary Embolism                   | 0                            |
| Pain >6 weeks                        | 0                            |
| Pain requiring injection             | 0                            |
| Seroma >6 weeks                      | 0                            |
| Recurrence                           | 0                            |

* One patient had atrial fibrillation, and another had an antero-septal myocardial infarction that was managed medically.
patient required reoperation for evacuation of hematoma at a trocar site. Nineteen patients (95%) were available for follow-up. No patients complained of pain at a transabdominal suture site or persistent seromas by 6 weeks of follow-up. No recurrences occurred, and no patients required mesh removal during a mean follow-up of 3.1 months (range, 2 to 1063 days). No deaths occurred.

DISCUSSION

Ventral hernia formation is one of the most common long-term complications of laparotomy, with a reported incidence of 3% to 20%. Simple closure is associated with high recurrence rates of nearly 50% as well as considerable morbidity. The introduction of prosthetic mesh improved the recurrence rates of open repairs to 11% to 21%. However, the complication rate remained high at 14% to 50%, with the majority (12% to 24%) attributed to wound complications. Heniford et al published findings of an 850 patient cohort who underwent LVHR illustrating decreased wound-related complication and recurrence rates. Many other groups have published studies supporting their findings. To our knowledge, only a few studies focus on the elderly patient population, specifically with a patient age over 60 years (Table 2). In our study, all patients were age 80 or greater, and all had an ASA classification of 2 or 3.

Studies that compare open and laparoscopic techniques have consistently shown that LVHR has a lower complication rate mostly attributed to fewer local wound complications. Tessier et al described a patient population undergoing LVHR with an average age of 68.5, with 76 patients over age 60, and 21 under age 60. Of their age group under 60, 6 minor complications (29%) and 1 major complication (4.8%) occurred in 21 patients. Of their age group over 60, 27 minor complications (36%) and 5 major complications (6.6%) occurred in 76 patients. This totaled a minor complication rate of 34% and a major complication rate of 6% for all age groups. The minor complication rate was slightly higher than that reported in other published series due to postoperative ileus and pulmonary complications. The major complication rate was equivalent to that in other series, which showed that LVHR performed in the elderly patient has essentially equal morbidity, mortality, and length of stay compared with LVHR performed in younger patients. Efficacy of repair was not one of their endpoints as their mean follow-up was only 3.6 months. Saber et al also evaluated the safety of LVHR in this population. Their study compared 2 patient populations, one under 65 years of age (n=126), and one over 65 years of age (n=29). They found equal complication and recurrence rates in the 2 populations (mean follow-up of 8 months), concluding that individual patient condition and existing comorbidities should be the deciding factors in whether to perform LVHR and not the patient’s age. In our cohort of 20 patients, we had a total of 10 minor complications (50%) and 4 major complications (20%). Table 2 compares our complication rates with rates from other studies we have referenced. No deaths occurred in our series.

Local wound complications are decreased with LVHR; however, seroma formation is an expected outcome in most patients. Seromas typically resolve within 6 weeks, and few are clinically significant. Our practice is to only drain significantly symptomatic seromas. None of our patients had seromas that lasted over 6 weeks on clinical examination. Another well-documented problem is pain at suture and trocar sites, which occurs in up to 23% of patients. This statistic has led to a debate as to whether transabdominal suture placement should be utilized, with some surgeons foregoing this step and some insisting on its necessity to avoid recurrence. All patients in our series had transabdominal sutures placed as part of their repair, but none had pain at trocar or transabdominal suture sites that lasted 6 weeks or necessitated injection of local anesthetic.
CONCLUSION

Our results add to the growing consensus that LVHR is a safe alternative to open repair regardless of age. LVHR is quickly becoming an accepted technique for hernia repair in the United States, with a well-documented decrease in recurrence rate reported in the literature in conglomerated age group categories. Long-term analysis of recurrence rates is necessary to evaluate the true effectiveness of LVHR in the elderly. However, our series demonstrates that this approach is safe and effective for a significantly older segment of the population.

References:

1. Mudge M, Hughes L. Incisional hernia: a 10 year prospective study of incidence and attitudes. Br J Surg. 1985;72:70–71.
2. Read R, Yoder G. Recent trends in the management of incisional herniation. Arch Surg. 1989;124:485–488.
3. Deverney KE. Hernias and other lesions of the abdominal wall. In: Doherty GM, Way LW. Current Surgical Diagnosis and Treatment, 12th Edition: Available at: http://www.accessmedicine.com/content.aspx?aID=2063136. Chapter 32.
4. Weber DM. Laparoscopic surgery: an excellent approach in elderly patients. Arch Surg. 2003;138:1083–1088.
5. Rosen M, Brody F, Ponsky J, et al. Recurrence after laparoscopic ventral hernia repair: a five-year experience. Surg Endosc. 2003;17:123–128.
6. Goodney P, Birkmeyer C, Birkmeyer J. Short-term outcomes of laparoscopic and open ventral hernia repair: a meta-analysis. Arch Surg. 2002;137:1161–1165.
7. Heniford B, Park A, Ramshaw B, Voeller G. Laparoscopic repair of ventral hernias: nine years’ experience with 850 consecutive hernias. Ann Surg. 2003;238:391–399.
8. Holzman M, Purut C, Reintgen K, Eubanks S, Pappas TN. Laparoscopic ventral and incisional hernia repair. Surg Endosc. 1997;11:32–35.
9. McGreevy J, Goodney P, Birkmeyer C, Finlayson SR, Laycock WS, Birkmeyer JD. A prospective study comparing the complication rates between laparoscopic and open ventral hernia repair. Surg Endosc. 2003;17:1778–1780.
10. Raftopoulos I, Vanuno D, Khorsand J, Khorsand J, Kouraklis G, Lasky P. Comparison of open and laparoscopic prosthetic repair of large ventral hernias. JSLS. 2003;7:227–232.
11. Raftopoulos I, Vanuno D, Khorsand J, Ninos J, Kouraklis G, Lasky P. Outcome of laparoscopic ventral hernia repair in correlation with obesity, type of hernia, and hernia size. J Laparoendosc Adv Surg Tech. 2002;12:425–429.
12. Berger D, Bientzle M, Muller A. Postoperative complications after laparoscopic incisional hernia repair: incidence and treatment. Surg Endosc. 2002;16:1720–1723.
13. Carbajo M, Martin del Olmo J, Blanco J, et al. Laparoscopic approach to incisional hernia: lessons learned from 270 patients over 8 years. Surg Endosc. 2003;17:118–122.
14. Tessier DJ, Swain JM, Harold KL. Safety of laparoscopic ventral hernia repair in older adults. Hernia. 2006;10:53–57.
15. Stoppa R. The treatment of complicated groin and incisional hernias. World J Surg. 1989;13:545–554.
16. Eid G, Prince J, Mattar S, Hamad G, Ikrammudin S, Schauer PR. Medium-term follow-up confirms the safety and durability of laparoscopic ventral hernia repair with PTFE. Surgery. 2003;134:599–603.
17. Saber AA, Elgamal MH, Mancl TB, Norman E, Boros MJ. Advanced age: is it an indication or contraindication for laparoscopic ventral hernia repair? JSLS. 2008;12:46–50.
18. Carbonell A, Harold K, Mahmutovic A, et al. Local injection for the treatment of suture site pain after laparoscopic ventral hernia repair. Am Surg. 2003;69:688–691.
19. Kirshtein B, Lantsberg L, Avinoach E, Phillips EH. Laparoscopic repair of larger incisional hernias. Surg Endosc. 2002;16:1717–1719.
20. Gillian G, Geis P, Grover G. Laparoscopic incisional and ventral hernia repair (LIVH): an evolving outpatient technique. JSLS. 2002;6:315–322.
21. LeBlanc K, Booth W, Whitakar J, Bellanger D. Laparoscopic incisional and ventral herniorrhaphy: our initial 100 patients. Hernia. 2001;5:41–45.