

A Comparison of Patient Recovery Following Unilateral and Bilateral Endoscopic Preperitoneal Herniorrhaphy

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ABSTRACT

Introduction: The advantage of using minimally invasive techniques over open techniques in the repair of inguinal hernias remains unclear. One of the more established indications for the performance of minimally invasive (e.g. endoscopic preperitoneal) herniorrhaphy is the presence of bilateral hernias. However, no prior study has compared the recovery following unilateral and bilateral endoscopic preperitoneal hernia repairs.

Patients and Methods: From July 15, 1994 through August 16, 1996 one primary surgeon performed 373 hernia repairs on 250 patients. Unilateral herniorrhaphy (UH) was performed on 114 males and 13 females with an average age of 58 (range 18 - 89). Bilateral herniorrhaphy (BH) was performed on 121 males and 2 females with an average age of 53 (range 18 - 86) ($p > 0.05$). Within the UH group there were 105 virgin hernias and 22 recurrent hernias. The BH group included 212 virgin hernias and 34 recurrent ($p > 0.05$).

Bilateral repairs took longer to perform than unilateral repairs (65 minutes vs. 45 minutes) ($p < 0.05$). At the time of discharge, all patients were given a postoperative survey and asked to record their level of pain, narcotic use and level of activity on the day of surgery and postoperative days 1, 2, 3, 7, 14, and 28.

Results: No differences were found in pain perception, narcotic use or level of activity on any of the days measured between the two groups ($p > 0.05$). In addition, both groups returned to work at a similar time (UH: 6.32 +/- 3.29 days, BH: 6.68 +/- 4.13 days) ($p > 0.05$).

Conclusion: Bilateral endoscopic preperitoneal herniorrhaphy can be performed with the same expected patient recovery as unilateral repairs.

INTRODUCTION

Since the introduction of laparoscopic hernia repair by Schultz in 1990,¹ surgeons have compared this new technique to the traditional repairs of McVay, Bassini, Shouldice and Lichtenstein. Several different laparoscopic techniques have been described by Corbitt,² Ger³ and others. Surgeons have shown that the laparoscopic techniques offer less pain and quicker recovery.^{4,5} The endoscopic preperitoneal herniorrhaphy, which is based on the established open preperitoneal techniques of Stoppa, Nyhus, Wantz and others, is becoming increasingly accepted as the best laparoscopic technique for repair of groin hernias.

Bilateral inguinal hernia repair is rarely performed during traditional open herniorrhaphy. On the other hand, one widely accepted indication for the performance of endoscopic preperitoneal herniorrhaphy is the presence of bilateral hernias. To our knowledge, no prior studies have compared the recovery following unilateral and bilateral endoscopic preperitoneal hernia repairs. Presented herein is a study comparing intraoperative and postoperative data for patients undergoing endoscopic herniorrhaphy for either unilateral or bilateral hernias.

PATIENTS AND METHODS

From July 15, 1994 to August 16, 1996, a total of 250 patients underwent repair of 373 hernias by a single surgeon (ALS) in a teaching setting. All repairs were performed on an elective, outpatient basis. One hundred twenty-seven patients underwent unilateral hernia repair (UH), while 123 patients underwent bilateral hernia repair (BH). The male:female ratio was 114:13 for UH and 121:2 for BH ($p > 0.05$). Mean age was 56 for UH (range 18-89) and 53 for BH (range 18-86) ($p > 0.05$). Type of anesthesia used and the percentage of virgin and recurrent hernias were likewise similar for the two groups (**Table 2**). (Note: all patients presenting with recurrent hernias had previously undergone open hernia repairs.)

The technique used involved a totally extraperitoneal approach. Patients were positioned supine. Preoperative antibiotics prophylaxis consisted of a single dose of cefazolin (1g) or vancomycin (500 mg). The preperitoneal

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Table 1.

Postoperative Patient Survey. Patients were asked to record responses to the following three criteria on the day of surgery as well as postoperative days 1, 2, 3, 7, 14, and 28. They were also asked to record the date of return to work and/or full "normal" activity. (note: notations in parentheses are legends for Figures 1-7)

PAIN	NARCOTIC PILLS TAKEN	LEVEL OF ACTIVITY
None (P0)	None (N0)	Mostly in bed (A1)
Mild, on walking stairs (P1)	One (N1)	Minimal walking (A2)
Mild, on walking (P2)	Two (N2)	Normal walking (A3)
Moderate, on walking (P3)	Three (N3)	Back to work, light duty (A4)
Moderate, continuous (P4)	Four to eight (N4)	Back to work, full duty (A5)
Severe (P5)	More than eight (N5)	No restrictions (A6)

Table 2.

Patient demographics.

	Unilateral Hernia Repair	Bilateral Hernia Repair
Number	127	123
Male:female	114:13*	121:2*
Mean age	56*	53*
Anesthesia	84 general*	90 general*
	43 epidural*	33 epidural*
Type	105 virgin	212 virgin*
	22 recurrent*	34 recurrent*

* p>0.05.

space was created with the use of a Preperitoneal Distension Balloon (PDB, Origin Medsystems, Menlo Park, CA) and was maintained with CO₂ insufflation at a pressure of 12 mm mercury. For all hernia repairs, dissection was carried out to identify and/or expose Cooper's ligament, the inferior epigastric vessels, the internal ring, the spermatic cord and the iliofemoral vessels.

A single sheet of polypropylene mesh was used to repair each hernia in this series (size range of 3 X 5 to 4 X 6 inches). A keyhole incision was created superiolaterally in the mesh to allow the mesh to wrap around the cord, thus recreating the internal ring. The mesh was fixed to the anterior abdominal wall and Cooper's ligament using either the Endoscopic Multifire Stapler (EMS, Ethicon Endo-Surgery, Cincinnati, OH) or Origin Tacker (Origin Medsystems, Menlo Park, CA). No mechanical fixation of the mesh was performed below the iliopubic tract except at Cooper's ligament.

At the completion of the repair(s), 30 cc of 0.25% bupivacaine with epinephrine (1:100,000) were placed into the preperitoneal space for the purpose of postoperative analgesia. Postoperative pain control was managed with oral acetaminophen with codeine (Tylenol #3) in all patients.

At the time of discharge, all patients were sent home with a postoperative questionnaire. They were asked to quali-

tate their level of pain as well as keep track of their level of activity and number of narcotic analgesic pills ingested. Patients were asked to log these criteria on the day of surgery as well as postoperative days 1, 2, 3, 7, 14 and 28. Patients were also asked to record their return to work or, if retired or unemployed, when they were able to resume full "normal" activity (**Table 1**). Initially, patients were asked to mail these forms back to the surgeon's office upon completion of the survey. With these response rates less than 100 percent, the forms were collected and discussed at the first postoperative visit (at 2-3 weeks postop) if the patients had returned to full activity.

All statistical calculations were made using SigmaStat Version 1.0. Statistical methods included t-test, chi-square test and Mann-Whitney Rank Sum test.

RESULTS

Intraoperative data are summarized in **Table 3**. Although operative time was longer in the bilateral group (65 vs. 43 minutes; p < 0.05), IV fluid requirements were the same for both groups (1289 cc vs. 1292 cc; p > 0.05). Blood loss was minimal in all patients. All hernia repairs were successfully completed endoscopically, with no conversions to open technique required.

Postoperative surveys were collected through mail follow-

Table 3.
Intraoperative data.

	Unilateral Hernia Repair	Bilateral Hernia Repair
Operative Time	43 minutes*	65 minutes*
IV fluids	1292 cc**	1289 cc**
Blood loss	minimal**	minimal**
* p < 0.05		
** p > 0.05		

up or at the time of the first postoperative visit. The overall response rate was 162 of 250 (65%). Response rates for the two groups were similar (81/127 (64%) for UH and 81/123 (66%) for BH; $p > 0.05$). Responses were collated and are summarized in **Figures 1-7**. The legend for these figures is given in **Table 1** (i.e., P0, P1,...,N0, N1,...,A1, A2, etc.).

No significant differences for perception of pain, narcotic use or level of activity were noted on any of the days measured ($p > 0.05$ for all comparisons on all days). The unilateral group returned to work/normal activity at 6.32 +/- 3.29 days and bilateral group returned to work/normal activity at 6.68 +/- 4.13 days ($p > 0.05$).

DISCUSSION

The advantages of using laparoscopic techniques to repair inguinal hernias are still debated. Previous studies have compared recurrence,^{4,7} postoperative pain,^{5,7,8} and complications.^{9,10} One of the more established indications for the performance of endoscopic preperitoneal herniorrhaphy is the presence of bilateral hernias, yet no prior studies have compared postoperative recovery following unilateral and bilateral endoscopic herniorrhaphy. The current body of literature is limited comparisons of laparoscopic techniques to open techniques.^{4,5,11} The majority of these studies have focused on transabdominal laparoscopic techniques.^{4,11-12}

In order to evaluate the postoperative course of patients undergoing groin herniorrhaphy, a survey was designed. This survey assesses patient recovery based on a qualitative measure of pain, a quantitative record of narcotic use, and a record of day-to-day activity. It also records the time to return to work or "normal" activity.

This study shows for the first time that the recovery following endoscopic preperitoneal herniorrhaphy is the same for patients with unilateral and bilateral hernias. No differences existed for perception of pain, narcotics used, or level of activity on any of the days analyzed. Return to work/normal activity was also statistically similar for the two groups.

The addition of a contralateral hernia repair during the performance of an endoscopic preperitoneal herniorrhaphy is well tolerated by patients. This is likely due to the small increase in operative time, as well as the minimal additional dissection needed to expose the inguinal anatomy on the second side. Bilateral herniorrhaphy can be performed without the need for additional trocar placement or repeat balloon dissection of the preperitoneal space. The tension free onlay of a second piece of polypropylene mesh apparently adds little to the postoperative symptom complex.

CONCLUSION

Our experience demonstrates that bilateral endoscopic preperitoneal herniorrhaphy can be performed with the same expected patient recovery as unilateral repair.

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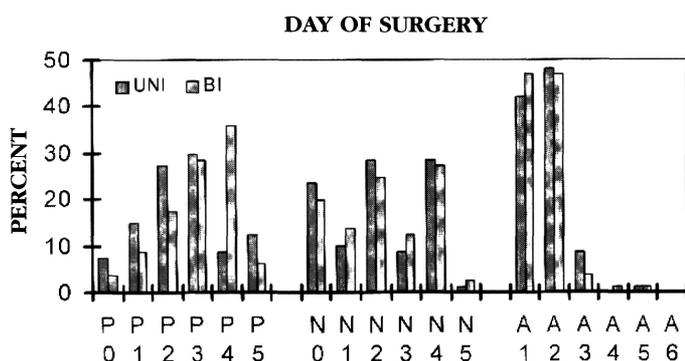


Figure 1. Postoperative data for endoscopic herniorrhaphy on day of surgery. (Note: legend for figure is in Table 1.)

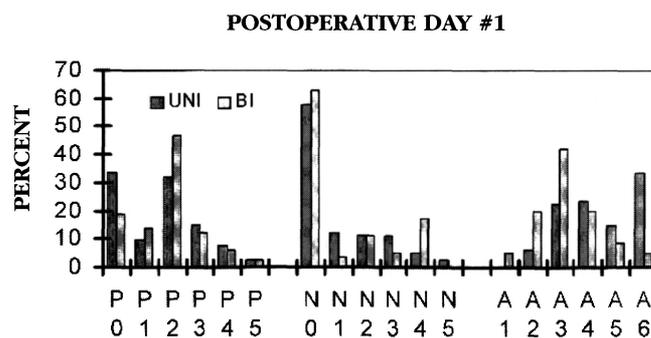


Figure 2. Postoperative data for endoscopic herniorrhaphy on postoperative day #1. (Note: legend for figure is in Table 1.)

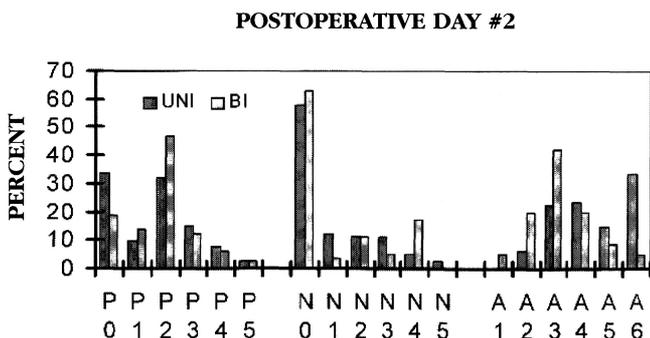


Figure 3. Postoperative data for endoscopic herniorrhaphy on postoperative day #2. (Note: legend for figure is in Table 1.)

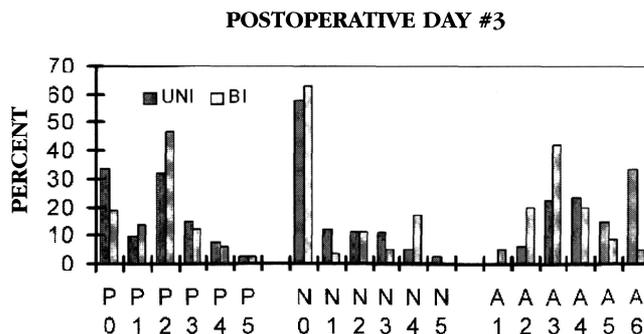


Figure 4. Postoperative data for endoscopic herniorrhaphy on postoperative day #3. (Note: legend for figure is in Table 1.)

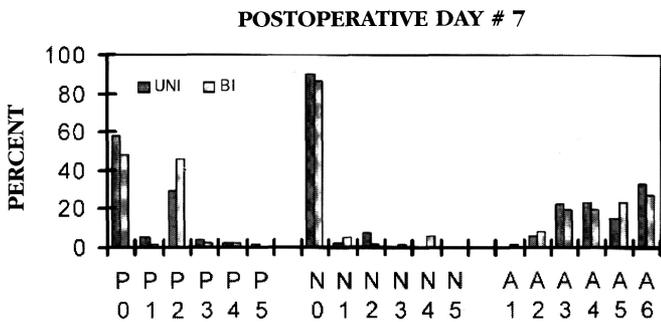


Figure 5. Postoperative data for endoscopic herniorrhaphy on postoperative day #7. (Note: legend for figure is in Table 1.)

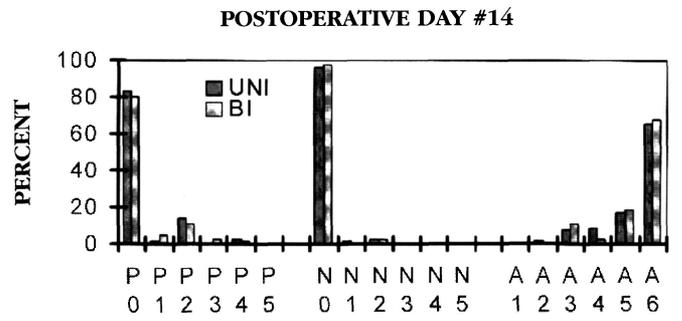


Figure 6. Postoperative data for endoscopic herniorrhaphy on postoperative day #14. (Note: legend for figure is in Table 1.)

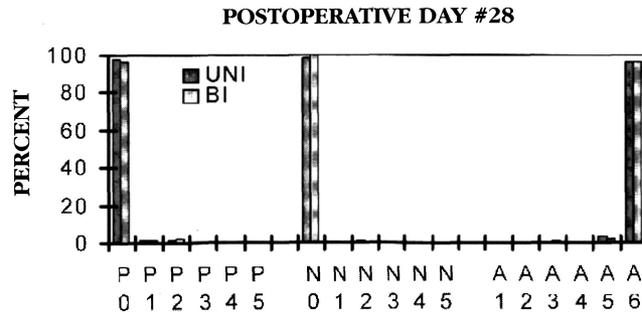


Figure 7. Postoperative data for endoscopic herniorrhaphy on postoperative day #28. (Note: legend for figure is in Table 1.)