Short Term Pain and Return to Activities Following Lichtenstein Inguinal Hernia Repair

S Farah, M Brygel

Citation

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Abstract

IntroductionThere has been extensive debate as to the merits of laparoscopic versus Lichtenstein hernia repair. Laparoscopic results have claimed less postoperative pain and more rapid return to normal activity. This study assesses the short-term results of a dedicated experienced hernia surgeon who uses the Lichtenstein technique with local anaesthesia and light sedation almost exclusively. It analyses post-operative pain, recovery, and return to normal activities and work.MethodologyThere were two study arms. The first was a randomly selected cohort of patients (n=405) who underwent single, bilateral or recurrent hernia repair from 2006 to 2008 by a single surgeon. The second was a prospective consecutive cohort (n=54) from 2010 who were stratified according to normal activity. Postoperative analgesia requirements, pain, and time of return to activities were recorded.ResultsIn cohort 1, return to work took a median of 6 days. Seventy-five per cent of patients were back to their normal activities and duties after 10 days. The median analgesia requirement was 2 days. In cohort 2, the median postoperative analgesia requirement was 3 days, with 75% requiring analgesia for no more than 6 days. The median return to normal activities or work was seven days, with 75% returning before 2 weeks. ConclusionLHR provides favourable short-term outcomes. Considering that convalescence is short or shorter and the rate of serious complications is low, this technique should be advocated more vigorously.

INTRODUCTION

There has been extensive debate as to merits and benefits of laparoscopic versus open inguinal hernia repair. Laparoscopic results have claimed less postoperative pain, more rapid return to home and outdoor activities as well as return to work[1]. There are now many and more sophisticated ways of assessing these outcomes such as using validated inguinal pain questionnaires. They attempt to measure pain in terms of tasks that can be carried out and the need for analgesia, not just a visual analogue score (VAS). However, fewer studies stratify patients into the type of activity and work they normally carry out. This is needed, as there are many factors which alter return to activities and work, such as age, health of the patient, occupation, post-operative advice, local cultures and definition of usual activity[2]. Taking these into consideration should give a more accurate determination of outcomes, and thus enable meaningful comparisons.

The study of early post-operative pain is also significant as it has been claimed to be an important predictor of chronic pain[3]. Similarly the role of pre-emptive, perioperative and multimodal analgesia extending into the post-operative period are thought to be important in determining the level of pain and other outcomes in the short term[4].

This study assesses the short-term results of one of a dedicated experienced hernia surgeon who uses the Lichtenstein technique with local anaesthesia and light sedation almost exclusively. It analyses post-operative pain, recovery, and return to normal activities and work.

METHODS

STUDY DESIGN

There were two study arms investigating patients who underwent an open Lichtenstein hernia repair (LHR), under local anaesthesia and sedation with a mesh reinforcement.

The first was a large case series of patients (n=405) who underwent single, bilateral or recurrent hernia repair from 2006 to 2008, whose data was collected at the time of repair. Their postoperative analgesia requirements and time taken to return to work or normal actvities were recorded at review.

The second was a detailed prospective consecutive cohort, operated upon in mid 2010. Fifty-eight consecutively repaired hernias from 2010 were selected, with a follow-up

rate of 93% (n=54). All patients with unilateral, bilateral or recurrent inguinal hernias were included. Patients were interviewed and examined at 1 and 4 weeks by the treating surgeon and interviewed at 2 and 3 months by telephone, to assess and determine the degree of recovery using a short-term questionnaire (STQ).

These two cohorts were then compared to see if there were any statistical correlations, and to assess the consistency of the results over several years, between a non-stratified and a stratified group.

SHORT TERM QUESTIONNAIRE

There have been fewer questionnaires that have been developed to assess short-term pain and recovery following hernia repair, with most focussing on long-term outcomes[5]. This study adopted many already established methods of assessing recovery as proposed by Kehlet and Franneby, as well as investigating the following primary and secondary outcomes:

PRIMARY OUTCOMES COHORT 1AND 2:

Time to return to normal activity

Analgesia requirements (required days of paracetamol 500mg and codeine phosphate 30mg tablets (2 tablets QID))

Complications

SECONDARY OUTCOMES COHORT 2:

Pain at 1 and 4 weeks

Comparison to preoperative pain

Percentage of normal activities able to be carried out at 1 and 4 weeks

Comparison to preoperative pain

Satisfaction with surgery

Cohort 2's normal activities and return to work were analysed, with patients stratified into four groups based on usual level of activity and/or occupation.

Office/Professional

Labourer

Retired active

Retired inactive and infirm

Other

SURGEON AND OPERATIVE TECHNIQUE

A single surgeon with experience in over 8000 hernia operations performed all the repairs. This ensured consistency with technique.

Procedures were carried out using local anaesthetic infiltration and light intravenous sedation. No pre-medication was used. Commonly fentanyl or IV anti-inflammatories were used at the time of surgery, depending on anaesthetist preference.

A combination of 20ml of lignocaine 2% with adrenaline 1 in 200,000 was combined with Bupivacaine 0.5% plain 20ml. A combined total of 40ccs was within the recommended maximum range for safety. For bilateral hernias and larger patients this was diluted with 10ccs of normal saline. The nerves were usually identified and preserved.

SURGICAL TECHNIQUE

The surgical technique has been well described[6]. Some important aspects of our technique and possible differences include:

No diathermy was used – the adrenaline kept the blood loss to a minimum,

The local anaesthetic technique required a gentle dissection method, facilitated by the local anaesthetic opening up the tissue planes between the sac and the cord,

For indirect hernias the sac was either excised or reduced (especially for sliding hernias),

For direct hernias the sac was reduced,

Many patients had an additional lipoma of the cord which was always excised,

A standard polypropolene mesh was generally used (Johnson & Johnson),

A standard skin stapler was used to fix the mesh.

Ethics approval was sought from the relevant local body, and all patients gave informed consent. All patients were also followed up in the clinic by the surgeon who performed the

operation.

RESULTS

Table 1 shows the patient characteristics between the two cohorts in terms of age, sex, length of hospital stay and type of hernia. There were no statistical differences between the two groups. There were no major intraoperative complications; 18/405 (4.44%) patients in cohort 1 and 4/54 (7.40%) in cohort 2 presented with a minor postoperative complication,.

Figure 1

Table 1: No statistical differences between both groups

	Cohort 1		Cohort 2	
Number of patients	405		54	
Number of repairs	442		58	
Male/Female	388/17		52/2	
Average Length of Hospital Stay	0.079 Days (93% Day Case)		0.167 Days (87% Day Case)	
Mean age (SD)	55.6 (16)		55.59 (14.92)	
Primary/Recurrent/Bilateral	389/16/53		56/2/4	
Complications	Haematoma Seroma Wound infection Testicular atrophy Visceral injury Numbness Recurrence Acute retention DVT/PE Other	4 6 4 0 1 0 0 1 0 2	Haematoma Seroma Wound infection Testicular atrophy Visceral injury Numbness Recurrence Acute Retention DVT/PE Other	0 0 3 0 0 1 0 0 0 0

COHORT 1

Figure 2

Figure 1: Days of post-operative analgesia requirement

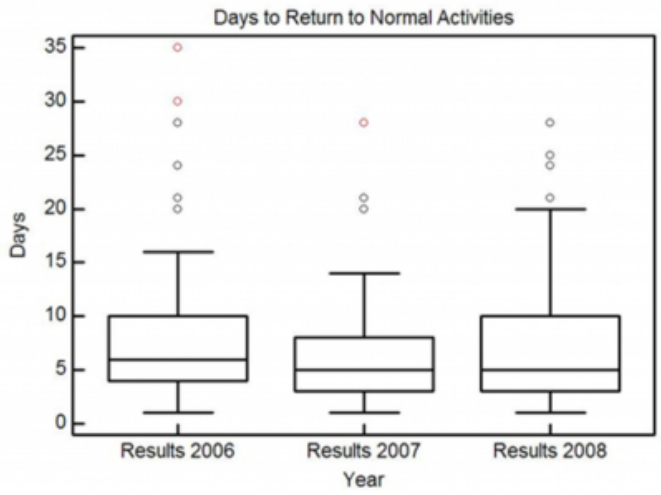
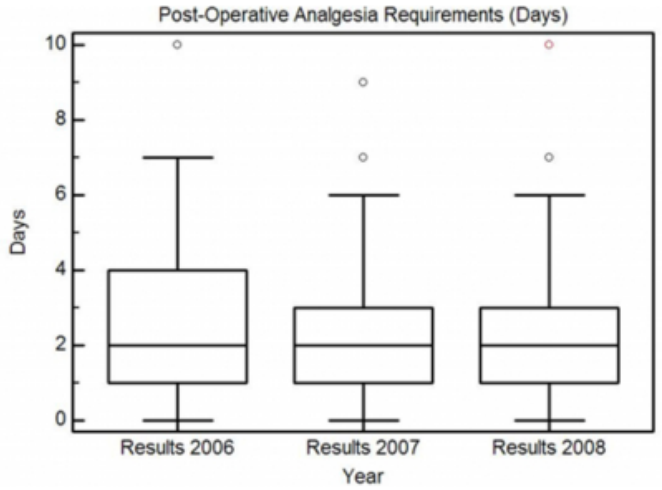


Figure 3

Figure 2: Days to return to work or normal activities



In the first study arm of 405 patients, return to work was consistent, with a median of 5 to 6 days (Figure 1). Sevety-five per cent of patients were back to their normal activities and duties after 10 days. Interestingly, the results were skewed by a number of outliers. On closer examination, the vast majority of these patients were patients being treated under the Australian “WorkSafe” scheme, for injuries caused by work. Those outliers required the same amount of analgesia post-operatively as all other patients. The median analgesic requirement was 2 days (Figure 2).

COHORT 2

Forty-one patients (75%) reported having preoperative pain. At the end of week 1, 28 (51%) had returned to their normal duties or work, with 24 (44%) stating that they felt that they were back to 100% at the end of week 4. The level of activity patients were able to complete at week 1 and week 4 are shown in table 2.

Figure 4

Table 2 Comparison of pain ratings, week 1 and week 4 after surgery. Values are number of patients, with percentages displayed in parentheses.

	Week 1	Week 4
Difficulties getting up from a chair	4 (7.4%)	0 (0%)
Difficulties sitting down	13 (24.1%)	1 (1.8%)
Difficulties climbing stairs	5 (9.3%)	4 (7.4%)
Requiring regular analgesia	6 (11.1%)	0 (0%)
Difficulties with exercise (if patient exercised preoperatively) 45 patients exercised 'sometimes' or 'often' preoperatively	23/45 (51%)	11/45 (24.4%)

Figure 5

Figure 3: Days of post-operative analgesia requirements 2010

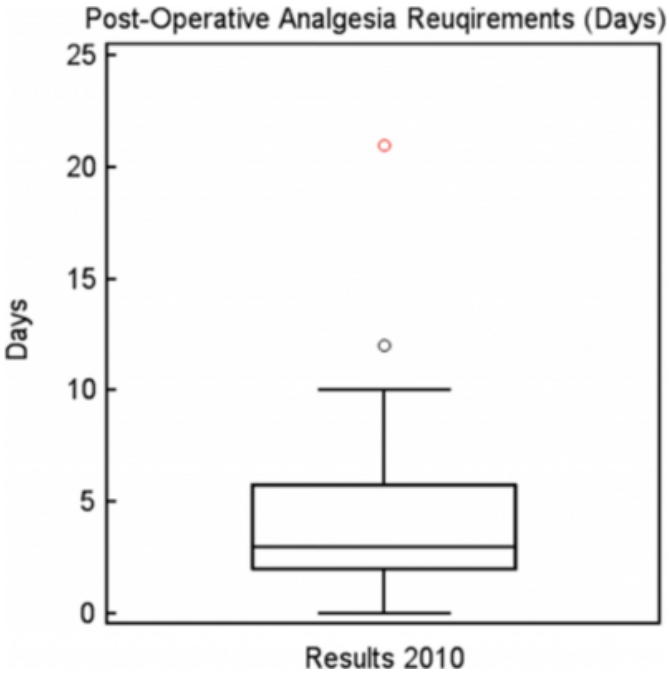


Figure 8

Table 4: Pre- and post-operative pain in patients from cohort 2 (n=54).

	Preoperative	Week 1	Week 4	
Percentage of patients with pain	33 (61.1%)	14 (25.9%)	8 (14.8%)	
Mean (SD) VAS	5.2 (2.1)	3.23 (2.9)	1.63 (2.18)	
P-value		0.00065	0.00006	

The median post-operative analgesia requirements for cohort 2 were 3 days, with 75% requiring analgesia for no more than six days. The median return to normal activities or work was seven days, with 75% returning before two weeks. These results are consistent with those from cohort 1.

Figure 7

Table 3: Return to work and analgesic requirements based on patient stratification in cohort 2. Patients who were retired and inactive and students were not included, as they do not form a large enough population to be statistically valuable.

	Mean (SD)	Median
Office/Professional (n=25)		
Return to work (Days)	7.625 (4.9)	7
Analgesia requirement (Days)	5.03 (4.8)	3
Labourer (n=9)		
Return to work (Days)	14.3 (12.9)	8.5
Analgesia requirement (Days)	3.3 (2.1)	3
Retired and Active (n=14)		
Return to work (Days)	9.71 (5.2)	8.5
Analgesia requirement (Days)	3 (2.7)	2

COMPARISON TO PREOPERATIVE PAIN

{image:8}

Patient Satisfaction with Surgery In the second arm, 94.4% of patients were satisfied with their repair, with three patients (5.6%) recording that they were “unsure”, and this was due to persisting pain following repair due to wound infection. One of these patients still had pain at 3 months.

OTHER COHORT COMPARISONS

HOSPITAL STAY

Most patients (93% Cohort 1, 87% Cohort 2) were treated as a day case. Those requiring longer admission were patients who had traveled from interstate, rural areas, who lived alone or were elderly and infirm.

DISCUSSION

The results of this study indicate that the LHR under local anaesthetic and light sedation provides favourable outcomes in terms of postoperative pain and return to normal activity or work; with the benefits of local anaesthetic being reflected in larger systematic reviews[7].

Return to work and activities has been reported to be seven days shorter following laparoscopic repair, with less short-term and persisting pain or numbness[8]. However, these came at an increased cost of a higher rate of serious complications, in particular visceral (bladder and bowel) and vascular injuries[8,9]. Considering that this study demonstrated a median return to activity of less than a week, these stated advantages are not so obvious and have also been previously reported[10]. Thus, the short-term results, when compared to the Cochrane-based multi-centre trials as released in the European guidelines[11], suggest that the widely claimed advantages of laparoscopy in the short term of up to 4 weeks are not so obvious.

This trend of accepting that laparoscopic repair is superior is concerning, as the literature has shown that the LHR provides good results[12]. Many of the studies that quote longer convalescence and more severe post-operative pain fail to provide attention to optimal treatment of acute pain with multimodal forms of analgesia[13]. Within this series, all patients received intraoperative local anaesthesia and postoperative oral opioid analgesia. As such, the differences in acute pain between laparoscopic and open repair may be minor and be more reflective of differences in pain management between studies[4]. This was discussed by Kehlet

in 2010[2], but in that series the Lichtenstein arm was treated with general anaesthesia.

Kehlet also highlighted the importance of patient stratification into relevant subgroups of activity and work intensity. Many studies have excluded patients in their studies for various reasons. However, all patients were included in this study, as this divergent group is commonplace in modern hernia practice. Office/Professional persons returned to work the fastest with a mean (SD) of 7.6 (4.9) days (Table 3). Active retirees were also similarly pleasing with a mean (SD) of 9.71 (5.15) days. Labourers required the longest time away from work with a mean (SD) of 14.3 (12.9) days, but required the same amount of analgesia as the other groups.

It was observed that those patients who took longer to recover in the short term or had persisting pain tended to belong into one of the following categories

Preoperative anxiety

Wound infection

WorkSafe insurance

SHORT TERM PAIN QUESTIONNAIRE (STQ)

Pain has been previously treated as dichotomous entity. Throughout this study, it was noticed that adequately defining pain was incredibly difficult for some patients, and the line between true pain or discomfort was often blurred. The questionnaire proposed by Franneby[5] for chronic pain had the advantage that it departed from the traditional model of analysing pain by a visual analogue score (VAS) or numeral rating system (NRS), and instead looked at important activity parameters after four weeks. To thoroughly investigate the early postoperative recovery, this study adopted components of Franneby's questionnaire with other traditional modes of pain measurement, to determine true outcomes using all the established techniques.

CONCLUSIONS

Lichtenstein hernia repair provides favourable and reliable short-term outcomes when compared to laparoscopic repair. The period of hospital stay and convalescence is short or shorter, and considering that the rate of serious complications is lower, this technique should be advocated more vigorously. The prospective component of the study exhaustively looked at consecutive patient outcomes and found these to be consistent with those of previous years. This confirmed the belief that these earlier results were a true reflection of postoperative results. Both arms of the study compared favourably to laparoscopic repair and as such laparoscopy did not necessarily offer the advantages claimed. Additional benefits include less cost to perform the repair, high patient satisfaction rate, and a shorter stay in hospital.

References

1. Langeveld HR, van't Riet M, Weidema WF, et al.: Total extraperitoneal inguinal hernia repair compared with Lichtenstein (the LEVEL-Trial): a randomized controlled trial. Annals of Surgery; 2010; 251(5): 819-824.
2. Kehlet H: Laparoscopic versus open groin hernia repair: are we getting closer to specific clinical recommendations? Hernia; 2010; 14(6): 553-554.
3. Aasvang EK, Gmaehle E, Hansen JB, et al.: Predictive risk factors for persistent postherniotomy pain. Anesthesiology; 2010; 112(4): 957-969.
4. Kehlet H, Bay-Nielsen M, Kingsnorth A: Chronic postherniorrhaphy pain--a call for uniform assessment. Hernia; 2002; 6(4): 178-181.
5. Franneby U, Gunnarsson U, Andersson M, et al.: Validation of an inguinal pain questionnaire for assessment of chronic pain after groin hernia repair. British Journal of Surgery; 2007; 95(4): 488-493.
6. Lichtenstein IL, Shulman AG, Amid PK, Montllor MM: The tension-free hernioplasty. American Journal of Surgery; 1989; 157(2): 188-193.
7. Joshi GP, Rawal N, Kehlet H, et al.: Evidence-based management of postoperative pain in adults undergoing open inguinal hernia surgery. British Journal of Surgery; 2012; 99(2): 168-185.
8. McCormack K, Scott NW, Go PM, Ross S, Grant AM, Collaboration EUHT: Laparoscopic techniques versus open techniques for inguinal hernia repair. Cochrane Database of Systematic Reviews; 2003; (1):CD001785.
9. Grant AM, Collaboration EUHT: Laparoscopic versus open groin hernia repair: meta-analysis of randomised trials based on individual patient data. Hernia; 2002; 6(1): 2-10.
10. Millikan KW, Doolas A: A long-term evaluation of the modified mesh-plug hernioplasty in over 2,000 patients. Hernia; 2008; 12(3): 257-260; discussion 323.
11. Simons MP, Aufenacker T, Bay-Nielsen M, et al.: European Hernia Society guidelines on the treatment of inguinal hernia in adult patients. Hernia; 2009; 13(4): 343-403.
12. Bay-Nielsen M, Thomsen H, Andersen FH, et al.: Convalescence after inguinal herniorrhaphy. British Journal of Surgery; 2004; 91(3): 362-367.
13. White PF, Kehlet H: Improving postoperative pain management: what are the unresolved issues? Anesthesiology; 2010; 112(1): 220-225.

Author Information

Sam S Farah, MBBS (Hons)
Master of Medicine (Clinical Epidemiology) Student , Surgical Resident, The Melbourne Hernia Clinic, Masada Hospital

Maurice Brygel, MBBS FRACS
Associate Professor, The Melbourne Hernia Clinic, Masada Hospital