

Outcome of Lichtenstein operation: A prospective evaluation of sixty-four patients

Shyam Kumar Shrestha and Vijaya Kumar Sharma

Department of Surgery, National Academy Medical Sciences, Kathmandu, Nepal

Corresponding author: Dr. Shyam Kumar Shrestha, Assistant professor, Department of Surgery, National Academy Medical Sciences, Kathmandu, Nepal. e-mail: snsrestha@gmail.com

ABSTRACT

To assess the feasibility and safety of open tension-free mesh repair (Lichtenstein operation) of inguinal hernias on ambulatory surgery basis. A prospective study of the Lichtenstein operation on 64 patients of inguinal hernias who were operated the authors and surgical trainees at Unit III, Department of General Surgery at National Academy of Medical Sciences (NAMS), Nepal from April 13, 2004 to April 31, 2006. Data related to age, sex, characteristics of the hernia, feasibility of the Lichtenstein operation under unmonitored local anesthesia and its surgical outcomes were compiled prospectively. The inguinal hernia was virtually a disease of male patients. In this study, male: female ratio was 63:1. Majority (84.4 %) of the inguinal hernias were safely operated under local infiltration anesthesia on day surgery basis with minimal morbidity rate (14.0%). The inguinal hernia is one of the common surgical problems of the adult population. The Lichtenstein operation can be safely performed on ambulatory surgery under unmonitored local anesthesia with a low morbidity. Hence, local anesthesia technique for the hernia repair is a viable alternative to spinal or general anesthesia.

Keywords: Inguinal hernia, Ambulatory surgery, Local anesthesia, Lichtenstein operation,

INTRODUCTION

Inguinal hernia repair is the commonest operation on male patients in general surgery.¹ The life risk for inguinal hernia is 27.0% for men and 3.0% for women.^{2,3} Hernia repair can be successfully performed using general, regional or local anesthesia. A potential advantage of local infiltration anesthesia is that it can be performed using so called unmonitored anesthesia care. Despite the fact that it is safe, simple, and cost-effective, there is a lack of acceptance of local infiltration anesthesia within the surgical community. During 1999 to 2001, just two years duration before the establishment of National Academy of Medical Sciences, more than 79.0% of inguinal hernia repairs in Bir Hospital were carried out by traditional techniques or its modifications (Bassini, or darn) under spinal or general anesthesia. Only 16.0% were operated under local anesthesia (unpublished data). This is in contrast to the fact that specialized hernia centers use local infiltration anesthesia in more than 95.0% of these cases.⁴⁻⁷ The fundamental change from traditional concept of stitching muscle to tendon followed the introduction of polypropylene mesh by Usher *et al*⁸ and prosthetic mesh repair technique by Lichtenstein *et al*.^{9,10} We present a prospective consecutive series of 64 open tension-free mesh repair (Lichtenstein operation), performed in Unit III, Department of general Surgery, National Academy of Medical Sciences during one year period.

MATERIALS AND METHODS

This is a single unit prospective study which was conducted from April 13, 2004 to April 13, 2005. Over this one year, 64 consecutive patients were operated for inguinal hernia at Unit III, Dept. of General Surgery, Bir Hospital, NAMS by the authors and surgical trainees under direct supervision of the authors. Fifty four patients were treated by Lichtenstein tension-free herniorrhaphy under unmonitored local anesthesia and remaining 10 patients operated under general or spinal anesthesia.

Operative technique: All patients underwent Lichtenstein operation. After six hours of fasting, all patients were placed in the supine position on the operating table, tilted head down by about 15 degree. All patients should have an intravenous cannula no 16 inserted, 1 gm of ampicillin and cloxacillin IV and Ringer lactate infusion were started immediately before the operation. No anesthesia personnel were scheduled to attend the patients during operation but they were readily available if needed. After aseptic draping of the surgical site, the ilio-inguinal block and local infiltration anesthesia were carried out by the operative surgeon using 30 ml of 1.0% lignocaine with adrenaline (300 mg lignocaine, maximum recommended single dose for an adult was 500 mg) and 30 ml of 0.25 bupivacaine a total of 75 mg (maximum recommended single dose for an adult was 200 mg).¹¹ The ilio-inguinal block was performed using 20 ml of 0.2% bupivacaine in a fan shaped manner underneath the external oblique aponeurosis, 2 cm above and medial to the anterior superior iliac spine. The surgical site was infiltrated with 10-15 ml of 1.0% lignocaine with adrenaline. Further, 5ml of 1.0% lignocaine with adrenaline was injected just above

the pubic tubercle in a fan extending upward and laterally from the pubic tubercle and peritoneum forming the base of the indirect sac.

The skin incision was placed 1 cm above and parallel to the inguinal ligament. It should extend from the pubic tubercle to about 1 cm lateral to the deep ring. Dissection was deepened into the subcutaneous fat, where two veins- the superficial epigastric and superficial external pudendal should be divided between ligature whilst smaller vessels can be diathermised. The external oblique aponeurosis was identified and exposed along the length of incision. The inguinal canal was opened by splitting the external oblique aponeurosis along the fiber, the spermatic cord with its cremasteric covering elevated with a tape. Next cremasteric fascia was incised along the full length of the cord. The indirect hernia sac was dissected free with sharp dissection up to the neck marked by collar of extraperitoneal fat and transfixed at the neck using 1/0 vicryl and excised. The direct sac was tacked sown by a continuous, placating absorbable suture using 1/0 vicryl.

A 15×6 cm prolene mesh (**Ethicon**) was trimmed to fit space of the inguinal canal floor, with a slit cut laterally to accommodate the spermatic cord. The rounded medial edge should lie 2-3 cm medial to the pubic tubercle. The medial edge of the mesh was sutured to the tissue over the pubic tubercle using 2/0 prolene suture. Three or four interrupted sutures were used to fix the superior and inferior edges of the mesh. The two tails were now overlapped lateral to the deep ring and stitched by two or three interrupted sutures making sure that the cord is not constricted in a new deep ring of the mesh. Having checked for haemostasis and safeguarded the ilio-inguinal nerve, the cord was replaced. Five ml of bupivacaine is left in the inguinal canal before closing the external oblique aponeurosis with continuous 1/0 vicryl. The skin closure is done by subcuticular 3/0 prolene suture which was removed on the 7th post-operative day.

Post-operatively, all patients were observed in the recovery room for 2-3 hours except those patients who had the repair under spinal or general anesthesia were observed overnight. Having emptied bladder, all 54 patients who underwent Lichtenstein operation under local anesthesia were discharged with oral paracetamol 1 gm qid, oral antibiotic **Periclox** (amoxycillin and cloxacillin) for 5 days, postoperative instructions and the telephone number of the operating surgeons. All patients were reviewed clinically on the 7th and 30th post-operative days, then every 6 months to detect any complication.

The patients were asked to give an estimate of pain relief on a four-point verbal rating scale (no pain, mild pain, moderate pain, and severe pain)¹² for those 54 patients who underwent Lichtenstein operation under local anesthesia.

RESULTS

A total of 64 patients of inguinal hernia were treated by Lichtenstein operation during one year period April 13, 2004 to April 13, 2005. The mean age of the patients was 44.59 years (21-81 years) with a gender ratio of 63:1 (Table-1). Only 54 patients were operated under unmonitored local anesthesia. The remaining 10 patients underwent operation under regional or spinal anesthesia (Table-4).

Overall morbidity rate was 14.0% (n=9): hematoma 3.1% (n=2), seroma 1.6% (n= 1), scrotal swelling 3.1% (n=2), superficial surgical site infection 1.6% (n=1), vasovagal syncope 1.6% (n=1) and wound numbness 3.1% (n=2) (Table-2).

Post-operative pain: Post-operative pain evaluation of was made only of those patients who underwent Lichtenstein operation under local anesthesia on ambulatory basis using four-point verbal rating scale (n=54). Majority of patients had experienced just mild pain / discomfort only (n=30). Eighteen patients had moderate pain and six patients had severe pain severe pain (Table-3). Majority of post-operative pain was managed by the oral paracetamol 1 gm qid (2-28 tablets). Only six patients needed extra analgesics, i.e., ibuprofen or diclofenac. Two patients did not use any analgesic postoperatively.

Recurrence rate: Follow-up was completed by clinical examination / telephone contact. None of our patients developed mesh infection and recurrence during the median follow-up period was 14 months (1-20 months).

Discussion

Ambulatory surgery or day surgery can be considered as the best option for more than 95.0% of elective hernia repairs.⁴⁻⁷ In our country, the day surgery is not developed compared to Western countries. Introduction of the tension-free hernia repair (Lichtenstein operation) has had an important impact on

surgeons' and patients' attitudes toward hernia surgery. General surgeons can easily learn Lichtenstein operation under local anesthesia confidently with low complication and recurrence rate. So, this operation has become the gold standard for inguinal hernia in ambulatory surgery.¹³ Local anesthetics are highly effective in alleviating post-operative pain when administered using both as peripheral nerve block e.g., ilioinguinal-hypogastric nerve block and local wound infiltration at the fascial level.¹⁴⁻¹⁷ Post-operative recovery is definitely faster with local anesthesia compared with general and regional anesthesia techniques.¹⁷

The overall morbidity rate was 14.0% (n=9), which includes the hematoma 3.1% (n=2), Seroma 1.6% (n=1), Scrotal swelling 3.1% (n=2), Wound sepsis 1.6% (n=1), vasovagal syncope 1.6% (n=1) and wound numbness 3.12% (n=2). We did not come across any case of nonsurgical postoperative morbidity like cardiovascular, pulmonary, gastrointestinal and urinary complications in local anesthesia group as it is described for inguinal hernia surgery under general anesthesia or spinal anesthesia.^{1,18,19} All four patients who underwent hernia repair under spinal anesthesia group were catheterized and only two patients in general anesthesia group needed urinary catheterization for retention of urine postoperatively.

The incidence of infection after hernia repair has been variously reported from 0.5% to 8.0%.^{10,20,21} In our series, only one patient 1.6% (n=1) developed superficial wound infection and was treated by antibiotics and regular dressing without need for removal of the mesh. Hence, the infection after mesh repair is no more common than after non-mesh repair.

In this series, wound numbness occurred in 3.1% (n=2), no more frequent than in other series.⁹ Wound numbness reflects a degree of damage to one or other of the iliohypogastric, ilioinguinal or genitofemoral nerves. This is an unavoidable, transitory, minor problem in the early postoperative period following open groin hernia repair and disappeared after 2-3 years.²²

The anesthesiologist should be easily available in the theatre because we had to call upon the anesthetic help for conversion from local anesthesia to general anesthesia in two cases (Table-4) and monitored anesthesia care for two cases (one vasovagal syncope and one exploration of hematoma). Majority of our patients (54) underwent Lichtenstein operation under local anesthesia and returned home on the day of operation. Only 10 patients who had spinal and general anesthesia were admitted over night for the observation (Table-4). Four bilateral and recurrent inguinal hernias were repaired under spinal anesthesia. With increasing experience, even such cases can be repaired safely under local anesthesia with lower cost and minimal morbidity.²³ Hence, the Lichtenstein operation using local anesthesia technique fulfill the requirements for the ambulatory surgery²⁴ except in few cases, e.g., a large irreducible hernia, gross obesity, uncooperative patients, severe anxiety, patients' informed refusal, allergy to the local anesthesia.⁵⁻⁷ The elective inguinal hernia surgery (Lichtenstein operation) can be performed safely on ambulatory basis.⁴⁻⁷

Recurrence is the ultimate test of the long-term success of a hernia repair. There was no recurrence rate in our series during short mean follow up period of 14 months. The recurrence rate of most specialized hernia centers is less than 1.0-2.0% and in some series it is zero. This small series of short-term follow up period is not enough to address the recurrence rate in the present study.^{12,25,26}

Day case elective inguinal hernia surgery (Lichtenstein operation) is a very simple and cost-effective procedure which can be safely performed in a teaching hospital setup under unmonitored anesthesia care with a low morbidity and low recurrence rate.

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Table-1: Hernia characteristics (n=64)

Median age in years (range)	44.59 years (21-81)
Sex ratio (M:F)	63:1
Type of hernia	
1. Indirect	52
2. Direct	3
3. Bilateral	7
4. Recurrent hernia	2
Type of anesthesia	
1. Unmonitored local anesthesia	50
2. Unmonitored local anesthesia + sedation	4
3. Spinal anesthesia	6
4. General anesthesia	4

Table-2: Post-operative complications (n=64)

Hematoma	2 (3.1%)
Seroma	1 (1.6%)
Scrotal swelling	2 (3.1%)
Wound sepsis	1 (1.6%)
Vasovagal syncope	1 (1.6%)
Chronic groin pain	2 (3.1%)
Total	9 (14.0%)

Table-3: Post-operative pain (n=64)

1. Mild pain	30 (46.9%)
2. Moderate pain	18 (28.1%)
3. Severe pain	6 (9.4%)
4. Not applicable	10 (15.3%)
Total	64

Table-4: Indication for spinal anesthesia / general anesthesia

Bilateral hernia	2
Recurrent hernia	2
Patients' choice	2
Conversion to general anesthesia	
Uncooperative patient	1
Hernia with bilateral hydroceles	