# Inguinal mesh hernioplasty under local anaesthesia

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## Abstract

**Objective:** To determine the frequency of operative and post-operative complications of Mesh hernioplasty for inguinal hernia under local anaesthesia and assess its safety.

**Methods:** This prospective study was conducted at Surgical Unit II, Liaquat University Hospital, Jamshoro, from January 2008 to October 2009. Only male patients between 20-65 years, having reducible direct or indirect complete or incomplete inguinal hernia were included. In the operation theatre local anaesthesia was infiltrated at the site of the hernia. The recommended open procedure was followed with the application of polypropylene mesh. The patients were shifted to the wards where they were put under observation for pain, vomiting, hypotension, urinary retention and wound haematoma, hourly for six hours and then onward till discharged from hospital.

**Results:** During the study, 108 male patients were included. Mean age was 38.5 ±10.12 years, 81 (75%) patients had indirect inguinal hernia; 27(25%) had the direct variety. In our study, 23 (21.25%) patients had minor problems during the procedure. Post-operatively, 31 (28.70%) patients developed wound pain, and of these 17 (54.83%) were in the early phase and 14 (45.16%) were in the late phase. Haematoma was seen in 4 (3.70%) patients, and of them, 1 (25.0%) developed this complication in the early phase, whereas 3 (75.0%) in the late phase. Two patients (1.85) in early post-operative phase had vomiting and one (0.92%) patient had urinary retention, while 3 (2.7%) patients in late phase had wound infection. The post-operative hospital stay ranged from 6 to 52 hours. The mean hospital stay was 27.27 ± 9.91 hours.

**Conclusion:** Inguinal hernia repair under local anaesthesia is safe and convenient. It has benefits like reduced risk of cardiopulmonary complications, short hospital stay and early return to routine life.

**Keywords:** Inguinal hernia, Mesh repair, Local anaesthesia (JPMA 62: 566; 2012).

## Introduction

Hernia is a Latin word that means rupture of a portion of a structure.[1] It is an abnormal protrusion of a viscus through the weak wall of cavity (abdomen) containing it. Weakness of the abdominal wall is either congenital or acquired in origin. Hernia can be reducible/irreducible/obstructed or strangulated. The external abdominal hernia is the commonest form of spontaneous hernia, and these are inguinal, femoral and umbilical in percentages 73 %, 17%, 8.5% respectively. As high as 80 to 90% of the repairs are carried out on male, and the most frequent type is right indirect inguinal hernia.[2]

The inguinal hernia may be indirect if passing through the deep inguinal ring or direct, resulting from weakness in the transversalis fascia in the posterior wall of the inguinal canal. The factors leading to the development of a hernia can be divided into congenital and acquired defects. The former may be responsible for the majority of groin hernia.

The surgical treatment of inguinal hernia can be carried out by various techniques e.g. Bassini repair, Darning, Shouldice's repair, Lichtenstein repair and Laparoscopic hernia repair. Inguinal hernia repair is one of the most commonly performed operations worldwide.[3] However, there is no consensus among surgeons regarding the best choice of anaesthesia. Several studies have shown that local anaesthesia provides the best clinical and economic benefits to the patient.[4] Spinal anaesthesia is an easy option, but complications like urinary retention, spinal headache and hypotension are frequently encountered.[5] In elderly patients with co-morbidity, surgeons should offer repair under local anaesthesia. The advantage include safety, simplicity, on-table assessment of repair, early post-operative mobility, and short stay in hospital.

Keeping the above advantages in view, we utilised this technique for all our hernia patients who met the inclusion criteria.

## Patients and Methods

This prospective study was conducted at Surgical Unit II Ward-12 of Liaquat University Hospital, Jamshoro, Pakistan. In this study 108 patients, admitted between January 1 2008 to October 31 2009, having inguinal hernia

were included. Male patients between 20 to 65 years, with reducible direct or indirect inguinal hernia, were included in the study. Exclusion criteria was female patients, patients presenting with recurrent hernia, huge hernia, obstructed hernia, inflamed hernia, incarcerated hernia, sliding hernia, cardiac or renal failure or patients having a chronic debilitating disease.

For all patients, injection Cephradine was used as a prophylactic antibiotic. The operative field was shaved in the operation theatre, intra-venous line was maintained with 18G intravenous canula and Ringer lactate solution was started. Local anaesthetic technique comprised infiltration anaesthesia and nerve block. Lignocain in the concentration of 0.5% with adrenaline (1:200000) and injection Bupivacain in 0.25% concentration was used in all the cases. Local anaesthesia (L/A) was given within safe dose (i.e Lignocain with adrenalin safe dose is 7mg/Kg). Using small bore, 22G needle three skin wheals were raised: 2cm medial to the anterior superior iliac spine; directly over the pubic tubercle; and over the deep inguinal ring, 1-2 cm above the midpoint of the inguinal ligament.

Using 22G needle, 5ml L/A solution was injected subcutaneously between wheal 1 and the anterior superior iliac spine. Three doses of 10 ml solution, each given in a fan shape, in the transverse plane were injected deep to external oblique aponeurosis (total 35 ml L/A). Through wheal 2, 5ml solution was injected directly on to the pubic tubercle, a further 5ml lateral to the tubercle at a depth of 3 cm and a further 10 ml subcutaneously towards the umbilicus for a distance of about 8 cm (total volume of solution: 55 ml). Through wheal 3, needle was passed perpendicularly backward to penetrate external oblique aponeurosis , 20 ml of solution injected in the line of inguinal ligament (total volume: 75ml. ). Next, 10 ml of solution was injected subcutaneously in the line of skin incision. During dissection of hernial sac, if pain was felt due to peritoneal traction, this was treated by injecting 10ml of solution into the neck of the sac.

A transverse skin crease incision was deepened down to the external oblique aponeurosis and cord was mobilised in the usual way. On lay mesh of appropriate size was placed, and loose interrupted sutures were applied overlapping the lateral tail of the mesh to provide a snug fit around the cord. After surgery, the patient was shifted to the ward, where he was monitored for pain, vomiting, hypotension, wound haematoma and urinary retention every hour for six hours and then six-hourly up to time of discharge from hospital.

Data were entered and analysed in statistical programme SPSS version 16.0. The qualitative data (frequencies and percentages) such as type of hernia, operative complications, post-operative complications were presented as n (%), while numerical variables like age, hospital stay was expressed as mean ± SD (standard deviation). No statistical test was applied for any comparison.

## Results

All the 108 patients studied were male. The age ranged from 20 to 65 years. The mean age was 38.5 ± 10.12 years. The indirect variety of inguinal hernia was 81 (75%) while the direct variety was found in 27 (25%) patients (Table-1). The hernial contents were spontaneously reducible in 66 (61%), while it was manually reducible in 42 (39%).

In our study, 23 (21.25%) patients had operative complications during the procedure. Out of these, 18 (16.7%) had mild pain, 3 (2.7%) had vomiting, while 2 (1.85%) developed hypotension. All the problems were successfully managed. Post-operative complications were studied in both early (within 6 hours) and late phases up to the time of discharge. Out of the 108 patients, 31 (28.70%) developed wound pain. Of these, 17 (54.83%) were in the early phase and 14 (45.16%) were in the late phase. The patients in early cases were managed by inj. Diclofenac sodium, and late cases by tablet Diclofenac sodium or Paracetamol. Haematoma was seen in 4 (3.70%) patients. Of them, 1 (25.0%) patient was in the early phase, whereas 3 (75.0%) patients were in the late phase. These patients were managed conservatively. Two patients (1.85%) in the early phase had vomiting, and 1 (0.92%) patient had urinary retention, while 3 (2.7%) in the late phase had wound infection (Table-2). As many as 85 (78.7%) patients resumed physical activity, such as taking fluid orally and going to the washroom, within six hours post-operatively, while 23 (21.3%) started such activity after six hours. Delay in physical activity was mostly due to pain or fear of developing pain.

The post-operative hospital stay ranged from 06 to 52 hours. The mean hospital stay was 27.27 ± 9.91 hours. The delay in discharge of most of our patients was due to the lack of medical facilities in their respective residential areas.

**Table-1: Type of Hernia.**

| Side | Direct (n=27) | Indirect (n=81) | Total |
|---|---|---|---|
| Right | 19 (70.4%) | 65 (80.2%) | 84 (77.8%) |
| Left | 8 (29.6%) | 16 (19.8%) | 24 (22.2%) |

**Table-2 Post-operative complications (n=108).**

| | Early Phase | Late Phase | Total |
|---|---|---|---|
| Wound Pain | 17 (54.83%) | 14 (45.16%) | 31 (28.70%) |
| Haematoma | 1 (25.0%) | 3 (75.0%) | 4 (3.70%) |
| Hypotension | 0 | 0 | 0 |
| Vomiting | 2 (100%) | 0 | 2 (1.85%) |
| Urinary retention | 1 (100%) | 0 | 1 (0.92%) |
| Wound infection | 0 | 3 (100%) | 3 (2.7%) |

## Discussion

Since Bassini's (1844-1924) period various methods of inguinal hernia repair have been discussed for better results. The ideal method of hernia repair is one that cause minimal discomfort to the patient during and after the surgery. It should be technically simple, and would have a low rate of complications and recurrence.[6,7] The Shouldice method remained acceptable for several years with a recurrence rate of 01 to 06 %.[8,9] Inguinal hernia repair performed by suturing and displacement of anatomical structures may lead to excessive tension on the suture line and surrounding tissues, resulting in recurrence. The use of prosthetic mesh allows tension free repair of inguinal hernia with better results.[10]

The prevalence of inguinal hernia is high in old and middle age.[11] Most of the elderly patients having inguinal hernia also have some concomitant disease (cardiac, pulmonary and diabetes) that increases the surgical risk.[12] Cardiovascular, pulmonary and urinary complications can occur after inguinal hernioplasty, especially when the procedure is performed under general or spinal anaesthesia.[13] On the other hand, patients operated under local anaesthesia do not generally have serious peri or post-operative complications.[14] Several retrospective and randomised control trials have shown that L/A provide the best clinical and economical benefits to patients.[15-17] Inspite of all these benefits, the use of local anaesthesia in inguinal hernia surgery has not been established among surgeons on a wide scale. In this study, we aimed at assessing the safety and benefits of local anaesthesia in mesh hernioplasty for inguinal hernia.

In our study, 23 (21.25%) patients had minor problems during the procedure and no patient developed anaphylaxis. A study done by Davis L et al in 2003, showed the anaphylaxis rate of about 1% to local anaesthesia.[18]

Pain is the main factor in post-operative morbidity. In this study 17 patients complained of pain within six hours post-operatively, and 14 patients had pain after six hours. Most of the patients remained pain-free within the six-hour post-surgery period. VanVeen and colleagues[19] between August 2004 and June 2006 noticed in their study that inguinal hernia repair under L/A had significantly less pain. Local anaesthesia is highly effective in alleviating post-operative pain when using both peripheral nerve blocking technique,[20] and local wound infiltration at fascial level.[21] In Young's study,[14] patients operated (inguinal herniorraphy) under L/A had lesser need for post-operative analgesia because most patients felt that the subsequent pain was more tolerable as it comes gradually, compared with those who had their surgery performed under general or spinal anaesthesia.

The incidence of post-operative nausea, vomiting and hypotension was negligible in our study and this is in line with other studies.[22,23] We also noted post-operative urinary retention rate because most of the patients were in the age of having enlarged prostate. Jenson et al[24] showed that urinary retention is definitely a problem after inguinal hernia repair when the procedure is done under spinal anaesthesia, but not when it is done under L/A. This is a very important observation and sheds light on a common old-age problem. Early post-operative mobilisation results in lesser morbidity and, hence, early discharge from hospital. Patients operated under L/A start physical activity earlier after surgery. Callese[25] also proves in his study that L/A facilitates the faster mobilisation and early discharge from hospital than the other anaesthetic techniques.

## Conclusion

Local anaesthesia has easy applicability and very low rate of pain and post-operative complications. It also encourages early mobilisation and early discharge from hospital. Hence, it is cost-effective and also reduces hospital burden. When anaesthesia-related complication, hospitalisation time, cost effectiveness and applicability to all patients are taken into consideration. Local anaesthesia can be recommended as a safe and effective technique for inguinal hernia mesh repair.

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