

Original Research Article

## Evaluation of inguinal hernia repair under local anesthesia - An experience of 30 cases

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**Abstract:** Inguinal hernia repair is one of the most commonly performed operations world-wide. Results of several studies indicate that local anesthesia provides the best clinical and economic benefits to patients. The present study was planned to study the outcomes of inguinal hernia repair under local anesthesia. The current retrospective study was conducted by the Department of General Surgery, SRMS Institute of Medical Sciences, Bareilly in February 2015. The outcome measures were type of anesthesia used, postoperative complications and recurrence. Hospital record of same cases were retrieved and analyzed. 5 patients in the age group of 18-40 year complained of anxiety which required intraoperative sedation with propofol, on the other hand one elderly patient aged 69 years required sedation with propofol. None of the study subject complained of intraoperative pain. All patients required 2 injections of analgesics like tramadol or diclofenac in the first 24 hrs. All patients were ambulated after 24 hrs. All patients were comfortable on oral analgesics from day 2 onwards. No patient complained of headache or hypotension in preoperative period. Two patients raised complaint of postoperative retention of urine.

**Keywords:** Inguinal hernia, repair, local anesthesia, patients

### INTRODUCTION

Inguinal hernia repair is one of the most commonly performed operations world-wide [1]. On the other hand; there is no common consensus among surgeons regarding the best choice of anesthesia for inguinal hernia repair. Results of several studies indicate that local anesthesia provides the best clinical and economic benefits to patients [2, 3].

The outcome of hernia repair may be influenced by other factors. There may be differences in the presentation of the hernia to the surgeon based on the damage done to the surrounding tissue in the inguinal canal, e.g., external ring, aponeurosis of the external oblique, inguinal ligament, which is most often accompanied by severe adhesions. Further factors influencing outcome of hernia repair may be patient-related factors, e.g., constipation, diabetes, smoking [4, 5]. There is paucity of data from the centers in India where inguinal hernia repair is one of the most

commonly performed procedures. Therefore this study was planned with the objective of analyzing the outcomes of inguinal hernia repair under local anesthesia.

### MATERIALS AND METHODS

The current retrospective study was planned and executed by the Department of General Surgery, SRMS Institute of Medical Sciences, Bareilly in February 2015. Analysis of inguinal hernia repairs performed at this tertiary care hospital was carried out. The outcome measures were type of anesthesia used, postoperative complications and recurrence. Hospital record of same cases were retrieved and analyzed.

In this study, 30 eligible patients underwent inguinal hernioplasty by Lichtenstein technique under local anesthesia and sedation. All the patients seeking surgical care for their unilateral reducible groin hernias at this tertiary care centre formed the study population. An inclusion criterion was stated as those patients

having unilateral reducible groin hernias and patients fit for anesthesia. Postoperative follow up was done till a period of 6 months.

The data were collected retrospectively and included demographics, type of inguinal hernia, technique of repair and early complications. The early outcome measures were postoperative analgesia, day-case rates, and early complications including wound

infection, haematoma, urinary retention, and unplanned re-admissions. The long-term outcome measures were chronic groin pain and recurrence. Data regarding chronic groin pain were also captured. The grade and character of the pain, associated numbness, as well as restriction of activities was ascertained. Nyhus classification of inguinal hernia, which is based on anatomical criteria, was used in this study [6]. (Table 1)

**Table 1: Nyhus classification of inguinal hernia**

Nyhus classification	
Type 1	Indirect inguinal hernia with a normal ring Sac in the canal
Type 2	Indirect hernia with an enlarged internal ring but the posterior wall is intact; inferior deep epigastric vessels not displaced, sac not in scrotum
Type 3a	Direct hernia with a posterior floor defect only
Type 3b	Indirect hernia with enlargement of internal ring and posterior floor defect
Type 3c	Femoral hernia
Type 4	Recurrent hernia A direct B indirect C femoral D combinations of A-B-C

50:50 mixtures of 2% xylocain and 0.5% bupivacaine were used for local anesthesia in inguinal hernia repair. 10ml of each solution diluted with 20ml of water for injection was used. Maximum 45ml of the mixture of lignocaine and bupivacaine was used for repair of unilateral inguinal hernia. Lignocaine provides rapid onset and bupivacaine results in a longer duration of local anesthesia. Anesthesia duration time can be prolonged further by the use of 2% lignocaine with adrenaline. Use of two different anesthesia agents decreases the likelihood of exceeding the therapeutic maximum dose of each individual agent. This is particularly useful in case of simultaneous bilateral inguinal hernia operation [1].

Following steps were followed for infiltration of local anesthesia for inguinal hernia repair. Subdermic infiltration was done using 25 gauge spinal needles and 5 to 7 ml sub dermic tissue infiltration was done along the incision line of inguinal hernia. Subdermic nerve endings were blocked and discomfort of the intradermic infiltration was greatly reduced by this step. 3 ml mixture was very slowly infiltrated intradermally along the line of incision to make skin wheal. Sodium bicarbonate solution was added to increase the pH of anesthetic mixture to reduce the pain of intradermic infiltration [3, 4]. Deep subcutaneous injection of 10 ml mixture was injected deep into the subcutaneous adipose tissue by vertical insertion of needle. The needle was kept moving to decrease the risk of intravascular infiltration. Subfascial infiltration of

approximately 8 to 10 ml of anesthetic mixture was injected underneath the external oblique aponeurosis through the window created in the subcutaneous adipose tissue at the lateral corner of the incision. This injection fills up the enclosed inguinal canal and thus blocks all the three nerves of inguinal canal. Gradually rest of the subcutaneous tissue is opened up to external oblique. Many a time's pubic tubercle and hernial sac need to be infiltrated with few ml of anesthetic infiltration. Complete local anesthesia was achieved following aforementioned steps. Intraoperatively surgery was closely monitored by a trained anesthesiologist.

The study adhered to the tenets of the Declaration of Helsinki for research in humans. Informed consent was obtained from patients after discussion of the advantages and risks. Permission of Institutional ethics committee (IEC) was sought before the commencement of the study. All the questionnaires were manually checked and edited for completeness and consistency and were then coded for computer entry. After compilation of collected data, analysis was done using Statistical Package for Social Sciences (SPSS), version 20 (IBM, Chicago, USA). The results were expressed using appropriate statistical methods.

## RESULTS

Data of 30 patients was included in this study. Mean age of the patients was 54 years with mean BMI of 27.

**Table 2: Classification of study subjects as per Nyhus classification**

Nyhus type	Number of patients
Type 1	11
Type 2	5
Type 3	12
Type 4	2

**Intraoperative observations in terms of duration of surgery and intraoperative complaints:**

Duration of surgery was approximately 30 to 40 minutes. 5 patients in the age group of 18-40 year complained of anxiety which required intraoperative sedation with propofol, on the other hand one elderly patient aged 69 years required sedation with propofol. None of the study subject complained of intraoperative pain.

**Post-operative observations in terms of post-operative complaints (48 hrs):**

All patients required 2 injections of analgesics like tramadol or diclofenac in the first 24 hrs. All patients were ambulated after 24 hrs. All patients were comfortable on oral analgesics from day 2 onwards. No patient complained of headache or hypotension in preoperative period. Two patients raised complaint of postoperative retention of urine. This retention of urine was delt with catheterization. Rest of the patients passed urine without catheterization. It can be said that

postoperative pain control was better. Anesthesia related known complications like spinal headache, perioperative hypotension, postoperative nausea and vomiting etc were not reported by the study subjects.

**Post-operative observations in terms of post-operative complaints (7 days):**

Scrotal edema was observed in 3 patients, which resolved in 2 weeks. Two patients had superficial wound infection for which antibiotics were given. Four patients were given mild oral analgesics on day 7 for mild local pain.

**Follow up findings (observations after 6 months):**

**Recurrence-** There was nil reporting regarding recurrence of the inguinal hernia.

**Pain-** Three patients reported local pain of low intensity at intervals for which oral analgesics were prescribed. There was no other complaint or complication.

**Table 3: Profile and postoperative complications among study subjects**

Variable	N (Percentage)	
Age (years)	65 (range, 18–82)	
BMI (mg/km <sup>2</sup> )	27 (range, 20–38)	
Postoperative complications	Haematoma	2 (6.67%)
	Urinary retention	2 (6.67%)
	Wound infection	2 (6.67%)
	Scrotal oedema	3 (10.0%)
	Recurrence	-
	Re-admission	-
	Pain	3 (10.0%)

**DISCUSSION:**

Currently very few centres repair inguinal hernis in local anaesthetic. Local anaesthetic inguinal hernia repair in the UK is being performed mostly in centres with a specialist interest in hernia repair or

public hospitals with a dedicated hernia service (Plymouth Hernia Service) and excellent results have been achieved both in terms of high day-case rates and reduced long-term recurrence (Table 4) [7-9].

**Table 4: Use of local anaesthesia and day-case rates in specialist hernia centres in United Kingdom**

Centre	% of LA	No. of cases	Day cases
Lichtenstein Hernia Institute	100%	> 5000	99%
British Hernia Centre	100%	> 4000	100%
Plymouth Hernia Centre	88%	1000	81%

Some centers in North America (Shouldice Clinic, Lichtenstein Hernia Institute and The Hernia Center in New Jersey) have achieved excellent results in terms of day-case rates and long-term recurrence

[10]. Results of another study from Britain are similar to our study [11]. The incidence of inguinal hernia is more in the elderly subjects. Associated conditions make them unsuitable for day-case repair. A commonly

perceived problem of local anaesthetic inguinal hernia repair is the pain of infiltration. This can be extreme enough for patients to be dissatisfied with the procedure and decline further local anaesthetic surgery. In this study we observed that addition of sodium bicarbonate to buffer local anaesthetic solution significantly reduces the perceived pain of inguinal hernia repair, both during the administration of the local anaesthetic solution and during the procedure itself.

Another problem of local anaesthetic inguinal hernia repair is toxicity. This is applicable especially in obese patients who require large volumes. The local anaesthetic mixture used in this study allowed us to use large volumes of the solution especially necessary for obese patients (the median BMI of the study group was 27.3 kg/m<sup>2</sup>). Reports of comparison of general and local anaesthesia have shown a similar incidence of urinary retention between local and general anaesthesia in all but one study [13, 14]. A large review of post herniorrhaphy urinary retention suggests that the incidence of urinary retention is lower with local anaesthetic inguinal hernia repair compared to general and regional anaesthesia [8]. Surprisingly, while reviewing the literature, we didn't come across any study, which compared the incidence of chronic groin pain between general and local anaesthesia. However, results from specialist centres have shown a very low incidence of chronic groin pain following a local anaesthetic inguinal hernia repair (1% at 1-year follow-up) [7].

#### CONCLUSION:

On the basis of findings of this study, it can be stated that better postoperative pain control was observed. Anesthesia related known complications like spinal headache, perioperative hypotension, postoperative nausea and vomiting etc were not reported by the patients. Recovery time was also shortened thus return to normal activity was anticipated. Thus local anesthesia for groin hernia repair may become an anesthesia of choice among patients especially in resource constrained settings.

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