

Original research article**Surgery to repair an inguinal hernia with local versus spinal anaesthesia****¹Dr. Jithendhar Parlapalli, ²Dr. Kishore Kumar Pujari, ³Dr. M. Manohar**^{1,2}Assistant Professor, Department of General Surgery, Kakatiya Medical College/MGM Hospital, Warangal, Telangana, India³Associate Professor, Department of General Surgery, Kakatiya Medical College/MGM Hospital, Warangal, Telangana, India**Corresponding Author:**

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Abstract

Introduction: This article provides a detailed breakdown of the analytical data gathered from contrasting inguinal operations done under local and spinal anaesthetic, so that readers can reach an informed judgement on the relative merits of these two approaches.

Materials and Methods: This prospective, analytical investigation compared the outcomes of surgeries performed under local versus spinal anaesthesia patients with uncomplicated unilateral inguinal hernia. Cost-effectiveness, patient satisfaction, and the incidence of problems during and after surgery were among the outcomes tallied and statistically examined.

Results: Patients in Group 2 were, on average, 43.2152.50 years old, while those in Group 1 were, on average, 45.2514.99 years old. The median time needed for surgery was the same in both groups, with no statistically significant difference ($p>0.05$). In both groups, postoperative complications were similar, with the exception of those related to spinal anaesthesia. The pain relief from local anaesthesia was better in the first twenty-four hours. The median length of time patients spent in the hospital recovering from surgery was lower in the local anaesthesia group. Time spent away from the workforce was shorter for Group 1 than Group 2.

Conclusion: Repairing an inguinal hernia using local anaesthesia is a tried and true method with a low risk/high reward ratio. This method will improve the amount and quality of surgical procedures performed in India, where the demand for care much exceeds the country's current capacity to provide it.

Keywords: Lidocaine, Bupivacaine, Inguinal block, Lichtenstein tension free repair

Introduction

Nearly 78% of all hernias are inguinal hernias, making them the most common type. Nearly all cases occur in men, and their prevalence increases with age. Morbidity rates are estimated to be 11 per 10,000 people between the ages of 16 and 24, and 200 per 10,000 people aged 75 and older ^[1]. Morbidity in hernia patients persists despite improvised approaches for hernia surgeries since the burden of emergency surgeries falls on scheduled hernia surgeries, which are then postponed and moved to a later available date. Waiting lists for normal hernia operations not only reduce the number of available hospital beds for more urgent procedures, but also have a significant impact on patients' quality of life, increase the likelihood of complications, and even need emergency operations ^[2]. Patient safety and the best possible operating circumstances for the surgeon are essential considerations when deciding the surgical and anaesthetic methods to use during a particular operation. Throughout the world, the Lichtenstein tension-free mesh repair technique has become the gold standard for treating adult open hernias. However, in a setting where the number of patients exceeds the available knowledge and resources, the decision of which anaesthetic technique (local versus spinal) to use presents a quandary. Inguinal hernias affect people of all ages and sexes equally. Inguinal hernias affect 27% of men and 3% of women throughout the course of their lifetimes ^[3].

In the past century, a hernia was itself a reason to undergo surgery to prevent the complications of occlusion and strangulation. This perspective has recently shifted from waiting to treat asymptomatic groin hernias to performing elective surgery as soon as possible ^[4]. The purpose of hernia repair is to eliminate fascial abnormalities that could act as a focal point for incarceration of abdominal contents and restore normal anatomic relationships in the area. The preoperative work up for a patient undergoing herniorrhaphy relies on the patient's medical condition and risk factors, as well as the type of anaesthetic to be utilized. The surgeon, anesthesiologist, and patient should all have input on the type of anaesthesia utilized. A lot of weight is given to the surgeon's and patients personal preferences when deciding on an anaesthetic ^[5, 6].

Because local anaesthesia has the least impact on other organ systems, it was chosen for this study

because it made patient selection and pre-operative evaluation easier. Local anaesthesia, specifically inguinal field block, is preferred for groyne hernia repair because it is quick and easy to administer, poses minimal risk of cardiovascular instability and urinary retention in the postoperative period, and allows the patient to return to full physical activity without delay [7, 8].

Patient safety and the provision of optimal working circumstances for the surgeon are the two most important criteria for selecting an anaesthetic approach for a certain surgical operation.

Material and Methods

This study was a prospective investigation that took place at Department of General Surgery, Kakatiya Medical College/MGM Hospital, Warangal, Sixty cases of inguinal hernia were included in the study, which covered the May 2021 to April 2022. After the patient was admitted to the hospital, a complete medical history and physical were performed. All patients had routine diagnostic testing, including a complete blood count, differential leucocyte count, erythrocyte sedimentation rate, random blood sugar, renal function tests, chest X-ray, and electrocardiogram. All permissions were recorded in writing.

Group 1 patients received inguinal hernia mesh repair under local anaesthesia, while Group 2 patients were sedated using spinal anaesthesia for the same treatment. For the anaesthetic, we mixed 1% xylocaine with 0.5% bupivacaine and 1:1,000,000 epinephrine for Group 1 patients. A skin wheal was raised by one centimeter from the iliac crest along the line of the anterior superior iliac spine and the umbilicus. A needle was then placed in the opening and used to penetrate the ilium's inner surface just below the crest. As the needle was slowly withdrawn, 10 ml of the solution was deposited. Another 5 mL of the fluid was injected, this time at a sharper angle. Two centimeters above the median inguinal, another block was inserted. Needle inserted at a straight angle through the skin of the external oblique aponeurosis to create a perforation. When the needle was withdrawn over a distance of 2 cm, 10 ml of the solution had been administered. Subperiosteally, through a wheal elevated over the pubic tubercle, 3 cc of solution was injected. Ten milliliters of fluid were injected subcutaneously along the incision line to complete the block.

Patients in Group 2 were given 0.5% bupivacaine spinal anaesthesia. The patient would be seated or lying on their side while a sterile needle would be inserted into their spine from the midline of their lumbar region. Inserting a 26-gauge spinal needle into the L3-L4 disc space. Upon ensuring adequate circulation of cerebrospinal fluid, 12.5mg (2.5 cc) of 0.5% bupivacaine was injected into the subarachnoid space (CSF). The supine position of the patient was being used. Patients were removed from studies and given general anaesthesia if either local or spinal anaesthesia failed.

Exclusion criteria

1. Complicated hernias, such as those that are strangulated, occluded, or irreducible. Every patient who undergone urgent procedures.
2. Patients who had an earlier appendectomies.
2. Patients who underwent bilateral herniorrhage
3. Repeated hernias.
4. People with obesity
5. Massive hernia
6. Other than inguinal hernias, groyne hernias
7. Patient agitation and refusal to consent

A stress-free Lichtenstein hernioplasty was performed on both groups. The hernioplasty mesh used was a 15x7.5cm polypropylene prosthetic mesh. After the procedure, we noticed a few things: Pain or discomfort experienced by a patient undergoing surgical operations that utilise a local anaesthetic. Acute postoperative symptoms include incisional pain, urinary retention, a hematoma at the surgical site, sepsis, a fever, a headache, and swollen or painful testicles. The patients were followed up with as outpatients on days 3 and 7. Wound infections, persistent pain, and other consequences were all tracked as patients were observed. The "Paired Student t test" was used to do statistical analysis on all of the data collected. Following surgery, Group 2 experienced less pain, fewer problems, and a shorter hospital stay than Group 1.

Observation and Results

Table 1: Age distribution

Age	Group 1	Group 2
Mean	45.25	43.42
SD	14.99	15.00
p value	0.50	Not-significant
Minimum age	20	25
Maximum age	77	74

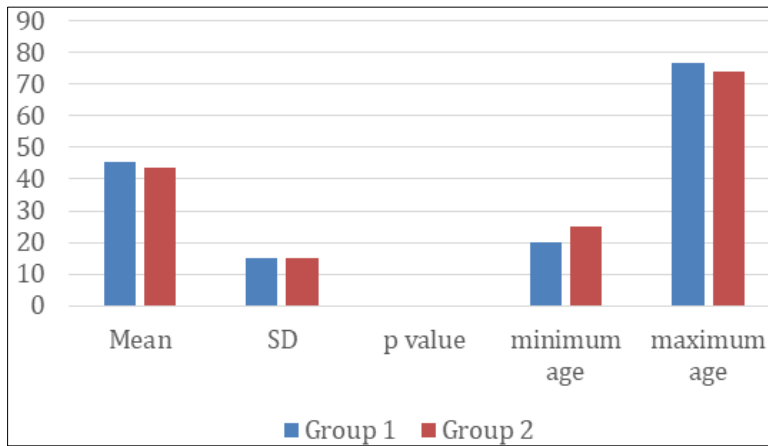


Fig 1: Age Distribution

Table 2: Distribution on the basis of types of hernia

Type of hernia	Group 1	Group 2
Indirect Inguinal hernia	18	25
Direct inguinal Hernia	12	5
Total	30	30

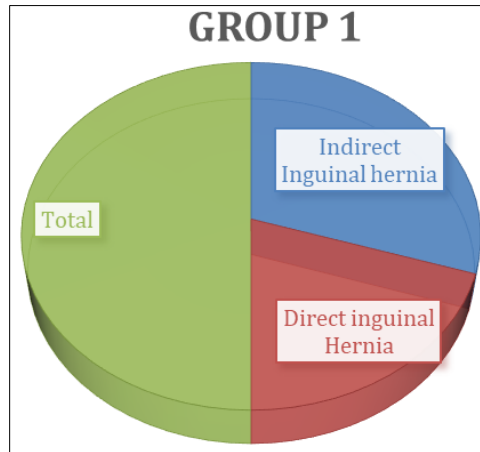


Fig 2: Distribution on the basis of types of hernia

Table 3: Distribution based on side of hernia

Side	Group 1	Group 2	Group 1%	Group 2%
Right	20	18	67	60
Left	10	12	33	40
Total	30	30	100	100

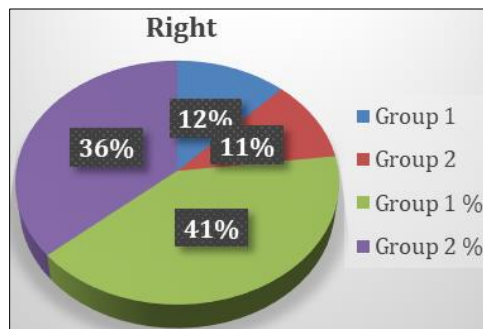


Fig 3: Distribution based on side of hernia

Table 4: Time taken for surgery in minutes

Time taken for surgery in minutes	Group 1	Group 2
20-30	5	0

31-40	10	3
41-50	10	4
51-60	4	11
61-70	1	4
71-80	0	5
81-90	0	3
Total	30	30
MEAN	41.00	60.90
SD	9.90	13.90
P	<0.001	Significant

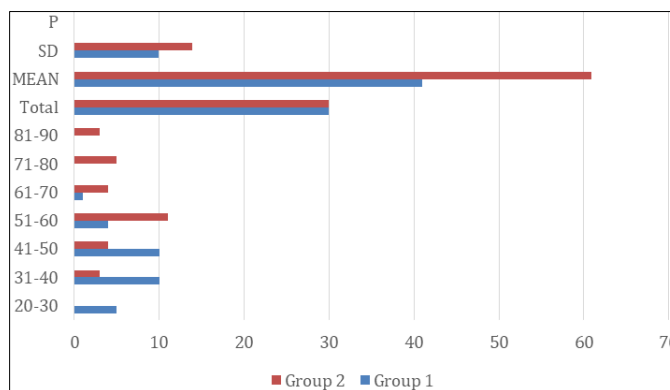


Fig 4: Time taken for surgery in minutes

Table 5: Pain felt during surgery using pain scale

Pain felt during surgery using pain scale	Group 1	Group 2
NOPAIN	1	2
MILD	22	14
MODERATE	5	12
SEVERE	2	2
Total	30	30

Table 6: Post-operation complications

Post-operation complications	Group 1	Group 2
Wound hematoma	1	1
Wound sepsis	2	2
Testicular pain	2	1
Urinary retention	1	4
Headache	1	1
Respiratory complications	1	1
Thromboembolism	1	1
Recurrence	1	1

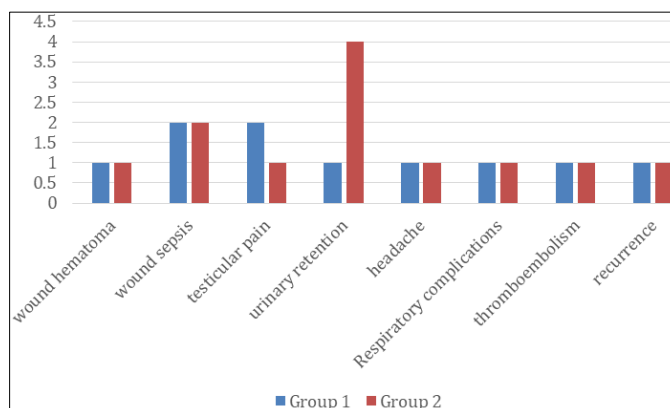


Fig 5: Post-operation complications

Table 7: Number of analgesic dose postoperatively

Number of analgesic doses Postoperatively	Group 1	Group 2
0	1	1

1	12	1
2	5	6
3	9	12
4	1	1
5	1	5
6	1	4
Total	30	30
MEAN	1.90	4.12
SD	1.20	1.49
P	<0.001	Significant

Table 8: Visualanalogscale

Visualanalog scale	Group 1	Group 2	p value	
S12	3.28	4.40	0.005	Significant
S24	2.20	2.90	0.030	Significant
S48	0.80	1.10	0.30	Not significant

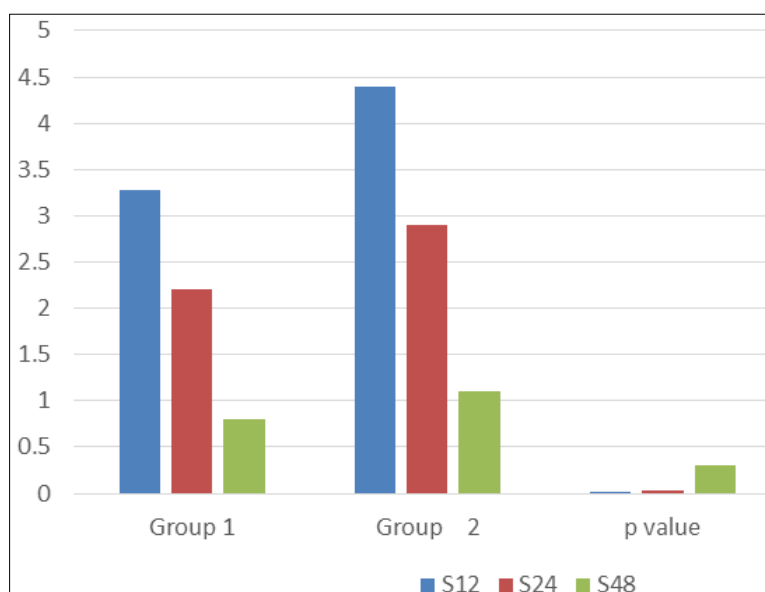


Fig 6: Visualanalogscale

Discussion

Patients' ages in this study varied from 20 to 77 in Group 1 and from 22 to 74 in Group 2. There was a significant difference in median ages between the two groups, with Group 1 having a mean age of 45.2514.99 and Group 2 having a mean age of 43.4215.00. Kark AE *et al.* study's contained data from 3,175 patients (1998). Patients ranged in age from 15 to 92, and 97% were male. Fifty patients were included in the study by Song *et al.* (2000); the average age of those given local anaesthesia was 4218 years, while that of those given spinal anaesthesia was 3914 years. The patient population consisted of 43 males and 7 females. Ryan *et al.* (1984), Young Dy. (1987), O' Dwyer *et al.* (2002), and Erdem F. (2003) 16 all came to similar conclusions in their own study. Patients' age and gender distributions in our study were similar to those in previous studies. Direct inguinal hernia was identified in 16 (64%) of Group 1 patients and 20 (80%) of Group 2 patients. Direct inguinal hernias were seen in 9 patients in Group 1 (36%), and 5 patients in Group 2 (20%). The results of our investigation were remarkably similar to those of the other studies. Eighteen patients (68% of the total) in Group 1 and fifteen patients (60% of the total) in Group 2 had a right inguinal hernia. There were eight patients in Group 1 with left-sided hernias (32%), and ten patients in Group 2 with them (40%). The results of this study coincide with those of other studies in this vein. Inguinal hernias tend to develop on the right side of the body because the right testis descends last and because patent processus vaginalis is more common on the right ^[8, 9].

The average surgical time for the first group in the current study was 42.88.6 minutes, while the second group needed 64.4513.7 minutes. Consistent with prior research, the results of our study mirrored those of Song *et al.* (2000), Job C *et al.* (1979), 2 and Young DV (1987). Many people worry about going through with surgery because of the dread of being in extreme pain. Although soreness is a common warning sign of tissue injury, its origin is not always obvious. Both afferent neural pathways and sensory neurons (nociceptors) contribute to the subjective experience of pain. In Group 1, 17 people (or 68% of the total) reported feeling some level of discomfort, with 5 (or 20%) reporting moderate pain. The pain levels were similar between groups, with 11 patients in Group 1 experiencing moderate discomfort and

14 patients in Group 2 experiencing the same. The gap between the two communities is noticeable. Conclusions from our study were generally in line with those from other studies in the same vein. Earle AS (1960) studied 46 people who had inguinal hernia surgery with local anaesthesia and found that half of them (23 people) experienced slight discomfort and the other half (23 people) experienced no pain at all^[10, 12].

The majority of patients (93%) who underwent surgery with only local anaesthesia reported no pain, whereas 7% experienced moderate to severe pain (Baskerville PA *et al.*, 1983). When a big hernia is being operated on, the patient may feel pain if dissection is difficult due to adhesions of the sac, hence general anaesthesia is sometimes used instead. Patients typically have a positive reaction to local anaesthetic when it is provided by an experienced surgeon. Pain during hernia dissection or relocation is the most common reason for transferring from local to general anaesthesia^[13, 14], as evidenced by studies by Wellword *et al.* (1998) 27, Amid P. *et al.* (1998, 2000, 2001), Song D. *et al.* (2000), and Callesen T. *et al.* (2001). Inadequate analgesia, urinary retention, wound infection, and traction on organs and muscles all contribute to post-operative discomfort. The ilio inguinal nerve, the ilio hypogastric nerve, and the genital branch of the genito nerve are only few of the regional nerves that are known to travel this route. Avoiding excessive nerve manipulation is one way to avoid this. The patients used a visual analogue scale to rate their pain after surgery. The amount of pain medication taken after surgery was used as a proxy for the severity of the patient's discomfort^[15].

In this study, patients reported their level of discomfort at 12, 24, and 48 hours following surgery using a visual analogue scale. Group 2 had VAS ratings of 4.40 at 12 hours, 2.90 at 24 hours, and 1.10 at 48 hours, while Group 1 had VAS scores of 3.28 at 12 hours, 2.20 at 24 hours, and 0.80 at 48 hours. When comparing the two groups' average pain visual analogue scores, Group 1 clearly has a lower value. (Table 3) Consistent with previous research by Song D *et al.* (2000), we found that patients who underwent inguinal hernia surgery under local anaesthetic had VAS ratings of 151.4, while those who used spinal anaesthesia had VAS values of 343.2. A considerable reduction in postoperative pain was reported by patients who underwent surgery while under local anaesthetic^[16, 17]. After surgery, 24 patients in Group 1 (96%) and 16 patients in Group 2 (64%) received between one and three doses of analgesics. Only one patient in Group 1 (4 percent) received 5 or more doses, while eight patients in Group 2 (32 percent) did. Specifically, the mean dose for Group 1 was 2.121.22 while the mean dose for Group 2 was 3.481.53. The average amounts of analgesics given to those in Group 1 and those in Group 2 differ significantly. Based on a comparison between patients who were given local and spinal anaesthesia by Young DV (1987), 22% of local anaesthesia patients required no postoperative analgesics. Of the 3,175 patients studied by Kark *et al.* (1999), 60% required oral analgesics (doses 2-3) for a median of 6 days. Consistent with previous research, our findings support this hypothesis. Patients undergoing operations that call for a local anaesthetic should expect to require lower doses of pain medication thereafter^[18, 19].

Fifteen (60%) of Group 1 patients and nine (36%) of Group 2 patients were housebound for 24 hours. Of the 30 patients in Group 1, 15 (60%) went back to work within 7 days, while the vast majority of those in Group 2 delayed more than 7 days. In a study including 103 patients, Teasdale *et al.* found that recovery time after local anaesthesia was significantly lower than that after general or spinal anaesthesia (1982). Barkerville PA *et al.* (1983) found that on the third postoperative day, 38% of patients returned to regular activity, 78% by the end of a week, and 98% by the end of two weeks. Song D *et al.* discovered that local anaesthesia (158 minutes) had the quickest recovery time following surgery, followed by general (208 minutes), and spinal (308 minutes). It was determined that encouraging patients to return to work as soon as feasible was the cause of the shorter time to return to work. Hospital stays are lengthened because of postoperative nausea, vomiting, drowsiness, and urine retention following general or spinal anaesthesia. It has been shown that patients who are able to walk around soon after receiving local anaesthetic have a lower probability of experiencing negative outcomes^[20, 21].

Repairing an inguinal hernia is a standard surgical procedure with an almost nonexistent mortality rate. Wound haematoma, wound infection, testicular discomfort, edoema, urine retention, headaches, and respiratory disorders are highlighted as problems that have low recurrence rates. Having a low complication rate is crucial when deciding on an anaesthetic and type of surgery. One patient in Group 1 developed wound sepsis (4%), while three patients in Group 2 did (12%). We found no evidence of wound haematoma in either group of individuals. As far as we know, no infections due to mesh have ever been documented. In a study involving 3019 patients, no mesh-related infections occurred after open tension-free mesh hernioplasty^[22]. This research was conducted by Shulman AG *et al.* Overall, the incidence of sepsis was 0.9%, and no fatalities were reported, according to research by Kark AE *et al.* (1995). In 1999, Gianetta E. *et al.* found that 3 percent of elderly patients who underwent inguinal hernia surgery under local anaesthesia acquired wound infections. Major problems and even death have been linked to both general and spinal anaesthesia in the postoperative period. The results we obtained agreed with those of other studies in the field. Patients in Group 1 did not suffer from urinary retention after surgery, but 5% of those in Group 2 encountered this issue. Information gathered from different sources on hernias suggests that local anaesthesia has the lowest incidence of urine retention compared to

regional and spinal anaesthesia. The present study confirmed the results of previous studies by Teasdale *et al.* (1982), Young DV. (1987), 2 Callesen *et al.* Spinal anaesthesia is known to create a side effect known as high-frequency urine retention, but its source is uncertain. We think this happens when the bladder's autonomic innervations get cut off for too long, leading to this disease. It may also matter how old the patient is and how much fluids they've been given. A patient's fluid consumption may need to be restricted before, during, and after surgery to reduce the risk of urinary retention [23-25].

There was no mortality, fewer postoperative complications, and shorter need for postoperative analgesia with Lichtenstein's hernioplasty performed under local anaesthesia (guided by ultrasound) in the current study. Patients undergoing inguinal hernia repair who receive local anaesthesia instead of spinal anaesthesia require less pain medication after the procedure.

Conclusion

The Lichtenstein tension-free hernioplasty, performed under local anaesthesia (Ultrasound guided), has marked the beginning of a new age in hernia surgery by doing away with the requirement for general anaesthesia. This method establishes a highly secure daycare facility for the elderly and those with debilitating diseases. Due to its inexpensive cost and high efficacy, this treatment is becoming increasingly popular due to its low risk of complications, low recurrence rate, and quick recovery time. Shorter hospital stays and fewer complications from the anaesthetic are the results. Potentially, this will replace traditional surgery as the gold standard for repairing groyne hernias.

Competing interests

None

Funding

None

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