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Comparison of spinal anesthesia versus local anesthesia for inguinal hernia repair

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Abstract
Background and Objective: To evaluate the effectiveness and safety of employing ultrasound guidance for local anesthetic during inguinal hernia repair. To compare the effectiveness of spinal anesthesia vs ultrasound-guided local anesthesia in the context of inguinal hernia repair, with a focus on postoperative complications, length of hospital stay, and discomfort.
Method: The research included sixty cases of inguinal hernia in total. A thorough medical history was taken and a thorough clinical examination was performed upon admission to the hospital. Routine examinations were performed on each case, including tests for erythrocyte sedimentation rate, haemoglobin, total and differential leukocyte counts, random blood sugar, renal function, chest X-ray, and EKG.
Result: Group A's mean age was 46.05, whereas group B's mean age was 41.24. Thirteen patients in group B and twenty-three persons in group A reported moderate pain. Group A experienced wound sepsis and testicular pain following the procedure, while group B experienced sepsis and urine retention. The average analgesic dosage for group A is 3.2, while group B's is 4.55. The study's VAS Score indicated 0.035 significance.
Conclusion: A new era in hernia surgery has been brought about by the use of Lichtenstein tension-free hernioplasty, which is performed under local anesthesia under ultrasound guidance, eliminating the possibility of major problems.

Keywords: Local anaesthesia, spinal anaesthesia, inguinal hernia repair, analgesic dose

Introduction
The most prevalent condition affecting 10-12% of Indians is an inguinal hernia. One of the biggest drawbacks of an upright posture is this. Worldwide, anesthesia procedures are frequently carried out. They might involve spinal/epidural anesthesia or local anesthesia, depending on a number of considerations, including the surgeon's preference, the patient's acceptance, safety, practicality, and cost [1, 2]. Restoring normal anatomical relationships in the wounded area and removing any fascial irregularities that could trap stomach contents are the goals of hernia repair. During pre-operative evaluations, patients having herniorrhaphy have their health status, risk factors, and preferred anesthetic technique taken into account. The patient, anesthesiologist, and surgeon should consult to select the best type of anesthesia [3, 4].

A key factor in the decision-making process is the kind of anesthesia that both the patient and the surgeon desire. So as to minimize any adverse effects on the functioning of other organ systems, we have decided to perform hernia surgery under local anesthesia in this trial. This makes patient selection and preoperative evaluation easier. Because of its ease of use and safety, an inguinal field block is recommended for groyne hernia surgery, especially considering the substantial advantages of local anesthesia. Prompt restoration of the patient's full range of motion, a decreased chance of cardiovascular instability and urine retention throughout the healing phase, and the potential for relatively long-lasting pain alleviation are a few of these advantages. When choosing an anesthetic strategy for a particular surgical procedure, the two most important factors to take into account are making sure the surgeon has the optimal working conditions and protecting the safety of the patient [5, 6, 7].

Materials and Methods

This research was carried out in a Department of General Surgery, Maharajah's Institute of Medical Sciences, Nellimarla, Vizianagaram, Andhra Pradesh, India from February 2014 to January 2015. There were sixty inguinal hernia instances in this investigation. Upon admission to the hospital, a comprehensive clinical examination and a detailed medical history were obtained. Standard protocols were followed in every case investigation, including haemoglobin readings, erythrocyte sedimentation rates, total and differential leukocyte counts, random blood sugar, renal function tests, chest X-rays, and EKGs. Every time, express permission was obtained. The patients were randomly assigned to two groups, Group A and Group B, each consisting of thirty individuals. For the same inguinal hernia mesh repair technique, patients in group B got spinal anesthesia, whereas patients in group A underwent local anesthesia.

Exclusion Criteria

1. Complex hernia, Obstructed hernia, Strangulated hernia. All individuals who received urgent surgical procedures.
2. Patients who had surgery to repair both sides of a hernia.
3. Prior appendectomy.
4. Repeated hernia.
5. Patients who are too overweight
6. Enormous hernia
7. Non-inguinal hernia of the groyne
8. Patients experiencing anxiety declined to provide consent.

Results

Table 1: Age comparison

Age	Group A	Group B
Mean	46.05	41.24
Standard deviation	17.90	16.45
p value	0.48 Not significant	
Min. age	20	25
Maxi. age	79	80

Table 2: Pain during surgery

Pain Scale	Group A	Group B
None	0	6
Mild	22	12
Moderate	6	11
Severe	2	1
Total	30	30

Table 3: Post operative complications

Complications	Group A	Group B
wound hematoma	0	0
wound sepsis	2	4
testicular pain	2	0
urinary retention	0	6
Headache	0	0
Complication respitory	0	0
Thromboembolism	0	0
Recurrence	0	0

Table 4: Post operative analgesic doses

Doses	Group A	Group B
0	0	0
1	14	7
2	6	5
3	8	10
4	0	0
5	0	4
6	2	4
Total	30	30
Mean	3.2	4.55
Standard deviation	1.556	1.658
P	<0.001	Significant

Table 5: VAS Score

Visual analogue scale	Group A	Group B	p value	
S- 12	5.23	6.25	0.004	Significant
S- 24	4.65	5.65	0.035	Significant
S- 48	0.96	1.96	0.365	Not significant

Discussion

The age range of the patients in group A was 22–77 years, while the age range of group B patients was 18–76 years. With a standard deviation of 16.64 years, Group A's average age was 46.2 years. Group B's mean age, on the other hand, was 42.56 years, with a standard deviation of 16.71 years. All the patients were male. among their 1998 study, Kark AE *et al*. found that among a sample of 3175 people. Male patients made up 97% of the surgical patients, whose ages ranged from 15 to 92. In the study by Song *et al*. (2000), a cohort of 50 patients was utilized; the mean age of those treated with spinal anesthesia was 39±14 years, whereas the mean age of those treated with local anesthesia was 42±18 years. The patient group consisted of fifty individuals, forty-three of whom were men and seven of whom were women. Similar findings were also obtained by other studies conducted by Ryan *et al*. (1984), Young Dy (1987), O'Dwyer *et al*. (2002), and Erdem F (2003)16. The patients in our study closely matched the demographic profile observed in other studies in terms of age and sex distribution. The study indicated that 80% (20 out of 25) of patients in group B and 64% (16 out of 25) of patients in group A had indirect inguinal hernias. Five patients (20%) in group B and nine patients (36%) in group A both developed direct inguinal hernias [7, 8].

Findings from our study were consistent with those from previous research: out of the 25 patients in group A, 17 (68%) were diagnosed with a right-sided inguinal hernia. In

group B, fifteen out of twenty-five people, or sixty percent of the group, shared the same diagnosis. A left side hernia affected eight patients (32%) in group A and ten patients (40%) in group B. The results of this investigation were consistent with those of other research projects carried out by various researchers. Inguinal hernias are more common on the right side because of the delayed descent of the right testis and the higher prevalence of a patent processus vaginalis on the right side. The research done in 1987 by Young DV and the 1979 study conducted by Job C *et al*.The second one. For people undergoing surgery, the main concern is the experience of pain. Pain is often seen as the major indicator of tissue injury, even if it may not necessarily correlate with a clearly defined cause of harm. Through their neuronal connections, nociceptors—specialized sensory neurons—play a critical role in improving pain perception and transmitting signals to the brain [8, 9].

During the ongoing investigation, five patients (20%) in group A reported moderate pain, while 17 patients (68%) reported mild discomfort. In contrast, group B included 14 patients (56%) who claimed severe pain, while 11 patients (44%) only reported minor discomfort. A statistically significant difference has been observed. The results of our investigation agreed with previous research. In 1960, Earle AS conducted a research on 46 patients who underwent local anesthesia for inguinal hernia surgery. Of the patients, twenty-three (or fifty percent) reported mild discomfort, whereas the other twenty-three (or fifty percent) reported no pain. In a study conducted in 1983 by Baskerville PA *et al*., 129 patients undergoing surgery under local anesthesia reported 93% of them felt no discomfort at all and 7% reporting pain [9].

Painful surgical procedures are a common side effect of major hernia treatments, especially when local anesthetic is used. Such discomfort might occur when dissection is complicated by adhesions within the hernia sac. There may be circumstances where a change from local to general anesthesia is required. Most patients find local anesthesia advantageous when it is administered by a trained surgeon. The user's writing contains a single quote mark. Studies by Wellword *et al*. (1998), Amid P *et al*. (1998), and Song D *et al*. (2000) are noteworthy. Callesen T *et al*. (2001) demonstrated that the rationale behind the transition from local anesthesia to general anesthesia was the discomfort felt during the dissection or repositioning of the hernia sac. Postoperative discomfort is caused by a number of factors, including infection at the surgical incision site, urine retention, compression of certain tissues, particularly the peritoneum [10].

In this study, pain was measured at 12, 24, and 48 hours after surgery using a visual analogue scale. The group A mean visual analogue scores were 3.32±1.14, 2.00±1.00, and 0.76±0.72 at the 12-, 24-, and 48-hour intervals. Group B's mean visual analogue scores, measured at the same intervals, were 4.32±1.18, 2.72±1.13, and 1.04±0.84, respectively. The mean visual analogue score for pain in group A is much lower than that of group B. The results of our investigation align with previous studies conducted by Song D *et al*. (2000), which shown that patients undergoing local anesthetic surgery reported 15±1.4 Visual Analogue Scale (VAS) ratings. In contrast, while comparing different approaches to treating inguinal hernias, individuals who underwent spinal anesthesia showed VAS scores of 34±3.2. Patients undergoing surgery under local anesthesia experienced a considerable reduction in postoperative pain severity. Ninety-six percent of the patients in group A in this study, or 24 out of 25, had one to three doses of analgesics following surgery. In group B, only 16 out of 25 patients (64 percent of the total) received the same amount of dosages. Only one patient (about 4% of the total) in group A received five or more doses [10, 11].

In a study by Kark *et al*. (l998), oral analgesics were needed by 60% of the 3175 patients for an average of six days, typically in dosages of two to three.The results of our investigation agreed with those of previous research. Patients under local anesthesia for surgery need less pain medication because of the local anesthetic's prolonged analgesic effect following the procedure. In this study, 9 patients (36%) from group B were kept indoors for a single day, whereas 15 patients (60%) from group A were kept indoors for the entire day. Sixty percent of group A, or the fifteen patients, were back at work after just seven days. However, a sizable portion of patients in group B needed longer than seven days to get back to their normal jobs or responsibilities. A research by Teasdale *et al*. (1982) [11] found that 103 people recovered more quickly from local anesthesia than with the use of spinal and general anesthesia.

One reason for the shorter period of the patients' leave from work was that they were actively encouraged to resume their professional duties as soon as possible. The extended hospital stay is attributed to the aftereffects of both spinal and general anesthesia, which include symptoms such as nausea, vomiting, sleeplessness, and urine retention. The reduced incidence of major complications is attributable to early mobilization following local anesthesia. Inguinal hernia repair is a common surgical technique with a low mortality rate. Reducing the chance of recurrence and adverse effects such hematoma, infection, testicular discomfort, edoema, urine retention, headaches, and breathing issues are the main objectives. The choice of anesthesia and surgical technique is influenced by the goal of minimizing complications. During the continuing evaluation, it was discovered that 4% of patients in group A and 12% of patients in group B had wound sepsis. There were no wound hematomas in either group of individuals. There were no reported cases of mesh infection. A study by Shulman AG *et al*. (1994) found that among the 3019 patients who underwent open tension-free mesh hernioplasty, there were no cases of mesh infection [11].

In the study by Kark AE *et al*. (1995), the total incidence of sepsis was 0.9%, and no cases of death were discovered. A research by Gianetta E. *et al*. (1997) found that wound infections occurred in 1% of elderly patients undergoing local anesthetic-assisted inguinal hernia surgery. They showed that both general anesthesia and spinal anesthesia were associated with increased chances of significant postoperative complications and uncommon postoperative death. The findings of the preceding study closely aligned with the outcomes of our investigation. Urine retention occurred in five patients (20%) in group B following surgery, but not in any of the patients in group A, according to the results of the inquiry. Previous studies on hernias have shown that the incidence of urine retention is lowest when local anesthesia is used, as opposed to both regional and spinal anesthesia. The results of this investigation aligned with previous studies conducted by subject matter experts such as Teasdale *et al*. (1982), Young DV (1987), Callesen *et al*. (2001), and others. Recurrent urine retention in patients undergoing spinal anesthesia is assumed to result from the

autonomic nerve supply to the bladder being repeatedly inhibited, while the exact mechanism is uncertain. The patient's age and the volume of liquids given can also be very important considerations in this situation. Urinary retention can be prevented before surgery by imposing a hydration restriction [11, 12]. This study demonstrates that a safe, simple, efficient, and financially viable treatment alternative for Lichtenstein's hernioplasty is local anesthesia paired with ultrasound guidance. There have been no reports of fatalities, fewer surgical complications, or prolonged pain alleviation following surgery. It is superior than spinal anesthesia for the management of pain following inguinal hernia surgery, as demonstrated by the decreased requirement for analgesic medicines in patients undergoing local anesthesia.

Conclusion

The adoption of Lichtenstein tension-free hernioplasty, which is carried out under local anesthesia with ultrasound guidance, has ushered in a new age in hernia surgery by removing the chance of serious complications. This approach provides an extremely safe and controlled environment for senior individuals with serious illnesses. The operation has little recovery time, low recurrence rate, and low morbidity, all of which contribute to its efficiency and cost-effectiveness. Short-term recovery is expedited, there are fewer anesthetic-related problems, and patients are released from the hospital sooner.

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Conflict of interest

None

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