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Original research article

COMPARATIVE ANALYSIS OF INGUINAL HERNIA REPAIR PERFORMED UNDER LOCAL ANAESTHESIA VERSUS SPINAL ANAESTHESIA

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Abstract

Background and objective: To assess the safety and efficacy of inguinal hernia repair using local anaesthesia guided by ultrasound. To evaluate the efficacy of ultrasound-guided local anaesthesia against spinal anaesthesia for inguinal hernia repair, specifically in terms of postoperative discomfort, complications, and length of hospital stay.

Method: The study encompassed a total of 60 instances of inguinal hernia. Upon admission to the hospital, a comprehensive medical history was obtained and a meticulous clinical examination was conducted. Every case had a set of routine investigations, which included testing for haemoglobin, total leukocyte count, differential leukocyte count, erythrocyte sedimentation rate, random blood sugar, renal function, chest X-ray, and EKG.

Result: The mean age in group A was 48.09 and 43.56 for group B. pain in group A was moderate for 23 individuals and 13 subjects in group B. Post-operative complications were wound sepsis, testicular pain for group A and sepsis and urinary retention in group B. mean of analgesic dose in group A is 3.1 and 4.35 in group B. VAS Score showed 0.035 significance in study.

Conclusion: The utilisation of Lichtenstein tension-free hernioplasty, conducted with the administration of local anaesthesia and guided by ultrasonography, has ushered in a novel age in hernia surgery, thereby eradicating the potential for significant complications.

Keywords: Local anaesthesia, spinal anaesthesia, inguinal hernia repair, Lichtenstein tension-free hernioplasty

Introduction

Inguinal hernia is a very frequent ailment that can affect anyone of any age or gender. Men get inguinal hernias 27% of the time, while women get them 3% of the time. Until the last century, a hernia's presence alone was sufficient reason to perform surgery in order to prevent the potential consequences of obstruction and strangulation. There has been a shift in perspective recently about asymptomatic groyne hernias, moving away

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from observation and waiting to selecting early elective treatment [1, 2]. The objectives of hernia repair are to eliminate any fascial abnormalities that could trap stomach contents and restore normal anatomical relationships in the injured area. The patient's health status, risk factors, and desired anaesthetic technique are taken into consideration during pre-operative examinations for patients undergoing herniorrhaphy. To determine the optimal kind of anaesthesia, the patient, the surgeon, and the anaesthesiologist should consult [3, 4].

The anaesthetic type that the patient and the surgeon want is a major consideration in the decision-making process. For this reason, we have chosen to perform hernia surgery under local anaesthesia in this experiment in order to minimise any negative effects on other organ systems' functionality. This facilitates preoperative assessment and patient selection. Given the significant benefits of local anaesthesia, an inguinal field block is advised for groyne hernia surgery due to its simplicity and safety. Some of these benefits include the potential to provide relatively long-lasting pain relief, a lower risk of experiencing cardiovascular instability and urine retention during the healing period, and the prompt restoration of the patient's complete range of motion. Providing the best working circumstances for the surgeon and ensuring patient safety are the two most crucial considerations when selecting an anaesthetic strategy for a specific surgical procedure [5, 6, 7].

Material and Method

This research was carried out in a Department of General Surgery, Deccan College of Medical Sciences, Hyderabad, Telangana, India from September 2022 to August 2023. This investigation included sixty cases of inguinal hernia. A thorough medical history was taken and a thorough clinical examination was performed upon admission to the hospital. Every case was investigated according to standard protocols, which included measurements of haemoglobin, total and differential leukocyte counts, erythrocyte sedimentation rates, random blood sugar, renal function tests, chest X-rays, and EKGs. Each time, explicit consent was acquired. The patients were divided into two groups, Group A and Group B, each with thirty members, at random. Patients in group B underwent spinal anaesthesia for the identical inguinal hernia mesh repair treatment, while patients in group A underwent local anaesthesia for the same procedure.

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.

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Result

Table 1: Age comparison

Age	Group A	Group B
Mean	48.09	43.56
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	4
Mild	23	13
Moderate	5	12
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	13	1
2	5	5
3	10	11
4	0	0
5	0	4
6	2	4
Total	30	30
Mean	3.1	4.35
Standard deviation	1.556	1.658

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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

Patients in group A ranged in age from 22 to 77 years, whereas those in group B ranged in age from 18 to 76 years. Group A's average age was 46.2 years, with a 16.64-year standard deviation. In comparison, group B's mean age was 42.56 years, with a 16.71-year standard deviation. Every patient was a man. Kark AE *et al*.'s (1998) study revealed that in a sample of 3175 individuals. 97% of the patients that had surgery ranged in age from 15 to 92 years, and they were all male. A cohort of 50 patients was used in Song *et al*. (2000)'s study; the mean age of those treated with local anaesthesia was 42±18 years, whereas the mean age of those treated with spinal anaesthesia was 39±14 years. There were fifty people in the patient group in all, forty-three of them were men and seven were women. Other research by Ryan *et al*. (1984), Young Dy (1987), O'Dwyer *et al*. (2002), and Erdem F (2003)16 also produced results that were similar to this one. The age and sex distribution of the patients in our study closely matched the demographic profile seen in other studies. According to the study, indirect inguinal hernias were found in 64% (16 out of 25) of patients in group A and 80% (20 out of 25) of patients in group B. Nine patients (36%) in group A had a direct inguinal hernia, while five patients (20%) in group B had the same type of hernia [7, 8].

Our study produced results that were quite similar to those of the other studies: of the 25 patients in group A, 17 (68%) had a diagnosis of right-sided inguinal hernia. Fifteen of the twenty-five individuals in group B, or sixty percent of the group, had the same diagnosis. Eight patients (32%) in group A had a left side hernia, while ten patients (40%) in group B had the same condition. The current study's findings aligned with those of previous studies conducted by different investigators. Due to the right testis's delayed descent and the right side's higher prevalence of a patent processus vaginalis, inguinal hernias are frequently seen on the right side. The investigation carried out by Young DV in 1987 and the study carried out by Job C *et al* in 1979.The number two. The experience of pain is the primary worry for those having surgery. Although it may not always correspond with a precisely defined cause of harm, pain is frequently considered to be the primary signal of tissue damage. Specialised sensory neurons called nociceptors play a crucial role in enhancing pain perception and sending messages to the brain through their neural connections [8, 9].

Of the patients in group A, five (20%) reported moderate pain during the course of the continuing investigation, whereas 17 (68%) reported mild discomfort. On the other hand, 11 patients (44%) in group B reported mild discomfort, whereas 14 patients (56%) claimed severe pain. There is a statistically significant difference. Our

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investigation's findings were consistent with earlier studies. Earle AS performed study on forty-six patients who had inguinal hernia surgery while under local anaesthesia in 1960. Of the patients, 23 (or 50%) experienced mild discomfort, and the remaining 23 (or 50%) did not experience any pain. According to a research by Baskerville PA *et al*. (1983), of 129 patients who had surgery while under local anaesthesia, 93% said they felt no discomfort at all, while 7% said they felt pain [9].

Surgical treatments often result in intense agony, particularly when big hernias are being treated with local anaesthetic. When adhesions within the hernia sac make dissection difficult, discomfort like this may arise. It could be necessary in some situations to switch from local to general anaesthesia. When a skilled surgeon administers local anaesthesia, most patients find it to be beneficial. The text written by the user has one quote mark. Notable studies include those conducted by Wellword *et al*. (1998), Amid P *et al*. (1998), and Song D *et al*. (2000). Callesen T *et al*. (2001) showed that the discomfort experienced during the dissection or repositioning of the hernia sac was the reason for the switch from local anaesthesia to general anaesthesia. Compression of particular tissues, especially the peritoneum, along with insufficient pain control, urine retention, and infection at the surgical incision site are the causes of postoperative pain [10].

In this study, a visual analogue scale was used to assess the pain levels at 12, 24, and 48 hours following surgery. At 12-hour, 24-hour, and 48-hour periods, the mean visual analogue scores in group A were 3.32±1.14, 2.00±1.00, and 0.76±0.72, respectively. Measured at the same intervals, group B's mean visual analogue scores were 4.32±1.18, 2.72±1.13, and 1.04±0.84, in that order. Group A's mean pain visual analogue score is noticeably lower than group B's. The findings of our study are consistent with earlier research by Song D *et al*. (2000), which shown that patients who underwent local anaesthetic surgery reported Visual Analogue Scale (VAS) ratings of 15±1.4. In contrast, VAS values of 34±3.2 were seen in those who had spinal anaesthesia when comparing various methods of treating inguinal hernias. Postoperative pain intensity was significantly reduced in patients who underwent surgery while under the effect of local anaesthesia. In this study, 24 out of 25 patients, or 96% of the patients, in group A received one to three doses of analgesics after surgery. Only 16 out of 25 patients in group B, or 64 percent of the total, received an equivalent number of doses. Of the patients in group A, just one patient (or 4% of the total) received five or more doses [10, 11].

60% of the 3175 patients in a research by Kark *et al*. (l998) required oral analgesics for an average of six days, usually in doses of two to three.Our investigation's findings were consistent with those of other studies. The prolonged analgesic impact of the local anaesthetic after the treatment is the reason why patients undergoing surgery under local anaesthetic require less pain medication. In this study, group A had 15 patients (60%) who were kept indoors for a full day, while group B included 9 patients (36%) who were kept inside for a single day. Within seven days, all fifteen patients in group A, or sixty percent of the group, were back at work. On the other hand, a considerable percentage of patients in group B required more than seven days to resume their regular tasks or employment. In comparison to the use of general and spinal anaesthesia, 103 individuals showed faster recovery after receiving local anaesthesia, according to a study by Teasdale *et al*. (1982) [11].

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The reduction in the duration of patients' employment absences was attributed to their proactive encouragement to promptly return to their professional responsibilities. The prolonged hospital stay is ascribed to the residual effects of spinal and general anaesthesia, encompassing symptoms like emesis, nauseous feeling, somnolence, and retention of urine. The early mobilisation after local anaesthesia is responsible for the lower rate of serious problems. Repairing an inguinal hernia is a frequently performed surgical procedure with a low death rate. The major goals are to reduce the likelihood of recurrence and the side effects, such as hematoma, infection, discomfort in the testicles, edoema, urine retention, headaches, and breathing problems. The objective of reducing complications influences the selection of surgical method and anaesthetic. 4% of patients in group A and 12% of patients in group B were found to have wound sepsis during the ongoing assessment. In neither group of people were there any instances of wound hematoma. There were no instances of mesh infection that were noted. According to a research by Shulman AG *et al*. (1994), there were no mesh infection instances among the 3019 patients who had open tension-free mesh hernioplasty [11].
Sepsis incidence overall was 0.9% in the study conducted by Kark AE *et al*. (1995), and no cases of fatality were found. According to a study by Gianetta E. *et al*. (1997), 1% of elderly patients who underwent inguinal hernia surgery and used a local anaesthetic experienced wound infection. They demonstrated that higher risks of serious postoperative complications and infrequent postoperative mortality were linked to both general anaesthesia and spinal anaesthesia. Our investigation's results closely matched the conclusions made by the earlier study. After investigation, it was found that five patients (20%) in group B developed urine retention after surgery, while none of the patients in group A had urine retention. Prior research on hernias has demonstrated that, in contrast to both regional and spinal anaesthesia, the incidence of urine retention is lowest when local anaesthesia is employed. The current study's findings were consistent with other research projects completed by Teasdale *et al*. (1982), Young DV (1987), Callesen *et al*. (2001), and other subject matter experts. Although the precise cause of recurrent urine retention in patients receiving spinal anaesthesia is unknown, it is thought to be the consequence of the autonomic nerve supply to the bladder being continuously suppressed. In addition, the patient's age and the amount of fluid administered can also be crucial factors in this case. Imposing a hydration restriction prior to surgery can lower the risk of developing urinary retention [11, 12]

This study shows that local anaesthesia combined with ultrasound guidance for Lichtenstein's hernioplasty is a safe, straightforward, effective, and financially feasible treatment option. No deaths, fewer surgical complications, or extended postoperative pain relief have been reported. As evidenced by the lower need for analgesic medication in patients undergoing local anaesthesia, it is better than spinal anaesthesia for managing pain after inguinal hernia surgery.

Conclusion

A new era in hernia surgery has been brought about by the use of Lichtenstein tension-free hernioplasty, which is performed under local anaesthesia under ultrasonography guidance, eliminating the possibility of major problems. For senior citizens suffering from serious illnesses, this method offers a very safe and regulated environment. The

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procedure is efficient and cost-effective, and these qualities are further enhanced by its minimal recovery time, low recurrence rate, and low morbidity. It causes less anesthetic-related complications, a quicker release from medical care, and an accelerated short-term recovery.

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Conflict of interest
None

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