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Retrospective Observational Study to Compare the Outcomes of Administration of Spinal Anaesthesia vs Local Infiltration Field Block Anaesthesia for Open Surgical Treatment of Inguinal Hernia

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ABSTRACT

Background: One of the first surgical disorders in human history is a hernia. In the modern world, one of the surgeries that surgeons undertake most frequently worldwide is the elective treatment of an inguinal hernia. The goal of the current study was to assess the post-operative discomfort, length of hospital stay, and related problems between hernioplasty procedures performed under spinal anesthesia and local infiltration field block anesthesia.

Materials & Methods: A retrospective observational study was conducted in 60 patients who were more than 18yrs of age, admitted for management of primary uncomplicated unilateral inguinal hernia from Jan 2023 to Jan 2024. This study excluded the patients presenting with bilateral inguinal hernia, inguinal hernia with recurrence, patients with history of hypersensitivity to anaesthetic agents and patients presenting with complicated inguinal hernia. 30 patients in Group A were administered local infiltration field block anaesthesia and 30 patients in group B were administered spinal anaesthesia block for open surgical management. The VAS score was used to evaluate each patient's post-operative discomfort, length of hospital stay, and problems.

Result: The study included 60 patients with an average patient age as 42.14 +/- 4.16years. It showed that the mean VAS score was significantly much lower in patients who received local infiltration anaesthesia as compared to those who received spinal anaesthesia($p<0.05$). Furthermore, the incidence of headache, hypotension, and urine retention was significantly higher in the spinal anesthesia group than in the local anesthesia group ($p<0.05$).

Conclusion: Open Inguinal hernia repair done under local infiltration anaesthesia field block was found to be equally safe and efficient as spinal anaesthesia and also offers additional advantages such as reduced post operative pain, shorter hospital stay and absence of complications associated with spinal anaesthesia.

Keywords: Hernia, Lichtenstein repair, Pain score, Complications.

INTRODUCTION

One of the first recognized surgical disorders in human history is a hernia. In the current period, one of the most common surgeries performed globally is the elective treatment of an inguinal hernia.1 The Lichtenstein tension-free mesh inguinal hernioplasty operation is the most often utilised technique for correcting various kinds of inguinal hernias. For this surgery, a variety of techniques are used to administer anesthesia, including paravertebral anesthesia block, local anesthesia, and regional anesthesia such as spinal

and epidural anesthesia.2,3 Traditionally, hernia repair surgery was mostly performed 1under spinal anaesthesia block. The use of local infiltrative field anaesthesia block has proven as an effective alternative in the recent past.

When fixing an inguinal hernia, the choice of anesthetic is still subjective. The effectiveness and benefits of using local infiltration field block anesthesia for inguinal hernia surgery have been documented in a number of studies. The majority of centers nonetheless employ spinal or general anesthesia in spite of the stated benefits.

The current research aim to compare the length of hospital stay, complications, and post-operative pain between hernioplasty performed under spinal anesthesia and local anesthesia.

MATERIALS & METHODS

Patients over the age of 18 who were admitted between January 2023 and January 2024 for treatment of a primary, uncomplicated unilateral inguinal hernia were the subjects of this retrospective observational study. The study excluded participants with dual inguinal hernias, inguinal hernias that recurred, those who had a history of anesthesia-related hypersensitivity, and those who presented with difficult inguinal hernias.

The study's 60 inguinal hernia cases were randomly assigned to two groups, A and B, each consisting of 30 instances. The Lichtenstein tension-free mesh hernioplasty was carried out in groups A and B while under spinal anaesthesia and local infiltration field block anaesthesia, respectively. All patients were injected with Intradermal lignocaine and bupivacaine to check for hypersensitivity reaction.

Procedure for Local anaesthesia infiltration: A 40 ml solution was made comprising of 20 ml of 2% lignocaine with adrenaline (1:200,000), added to 20ml of sterile water. It was determined to be the region between the pubic tubercle and the anterior superior iliac spine. Ten milliliters of the prepared local anesthetic solution were administered in a fan-like fashion underneath the external oblique aponeurosis, 2 centimeters above and medial to the anterior superior iliac spine. A click is felt as the needle pierces the external oblique aponeurosis. Another 10ml is injected under the aponeurosis of the external oblique, just lateral to the pubic tubercle towards the umbilicus and then directed laterally. A short while later, another 10ml is infiltrated subcutaneously in the line of incision. 5ml of the anaesthetic solution is injected directly into the sac exposed during surgery. The remaining solution is used to supplement any part which is not anaesthetised adequately.

The patient was assessed for the following intro and post operative outcomes: postoperative urine retention, postural hypotension, headache, nausea, vomiting, postoperative pain at the incision site, utilizing a Visual Analogue Scale (VAS) pain grading system, and complaints during surgery hematoma at surgical site, infection of surgical site, testicular pain/Swelling. On a scale of 0 to 10, the Wong-Baker Faces Pain Rating was used to determine the intensity of the pain. With a score of 0 denoting no pain, 1-2 denoting mild pain, 4-6 denoting moderate pain, and 8–10 denoting severe pain, this study's scoring system was used.4 The total duration of hospital stay was also taken into account. Once the data was collected, it was sequentially compiled, tabulated and statistical analysis was done.

Statistical analysis: Excel was used to tabulate the data, and SPSS v23.0 was used for analysis. The data was summarised using the mean, standard deviation, frequency, and percentage. The summarised data was presented using tables, graphs, and figures. The mean difference between continuous and categorical data was examined using an unpaired t-test and a chi-square test, respectively. Statistical significance was defined as a p-value of less than 0.05

RESULT

The present study included a total of 60 patients with mean age of 42.14±4.61yrs, among which 53 patients were male and 7 patients were female with 32 patients having left sided Inguinal hernia and 28

patients had right sided hernia. In comparison to the spinal anaesthesia group, the mean VAS score for pain evaluation was considerably lower in the local anaesthesia group. ($p<0.05$).

Table 1: Comparison of age and mean Pain score between the groups			
	Local anaesthesia Mean ± SD	**Spinal anaesthesia Mean ± SD**	**p-value**
Age	39.62 ± 5.61	44.51 ± 4.95	0.698
	VAS Score		
6hr	3.56 ± 1.21	5.51 ± 2.54	0.01*
12hr	1.64 ± 0.84	2.98 ± 1.01	0.01*
24hr	1.22 ± 0.48	2.5 ± 1.21	0.01*
48hr	1.02 ± 0.39	1.5 ± 0.65	0.25
Mean hospital stays (days)	4.2 ± 1.2	4.6 ± 2.2	0.365

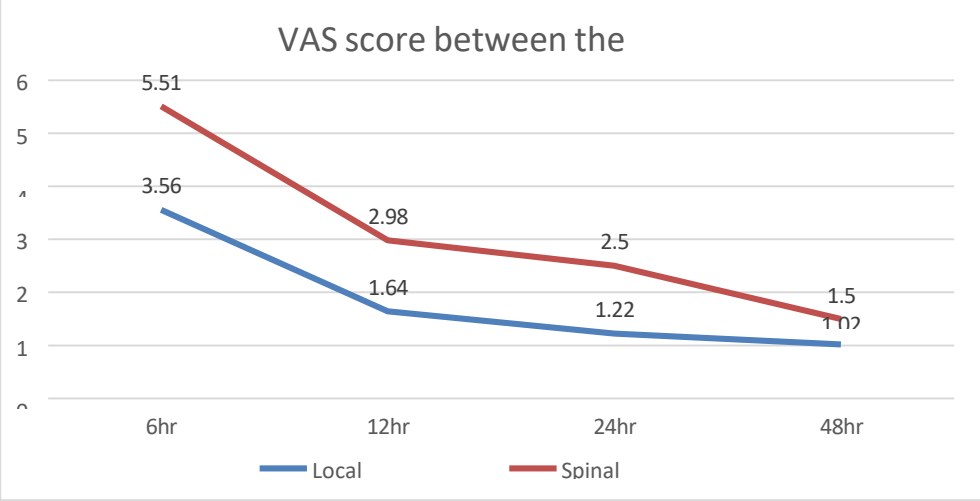

Figure 1: VAS score between the groups

Table 2: Comparison of complications between the groups			
Post-operative complications	**Local anaesthesia Group A**	**Spinal anaesthesia Group B**	**p-value**
Wound hematoma	0	0	-
SSI	2	2	-
Testicular swelling	2	3	-
Urinary retention	0	5	0.01*
DVT	0	0	-
Headache	0	2	0.01*
Hypotension	0	5	0.01*
Recurrence	0	0	-
Pain after 7 days	1	2	-

There is a significantly much higher incidence of hypotension, headache and urinary retention in spinal anaesthesia group than compared to that of local anaesthesia group. ($p<0.05$).

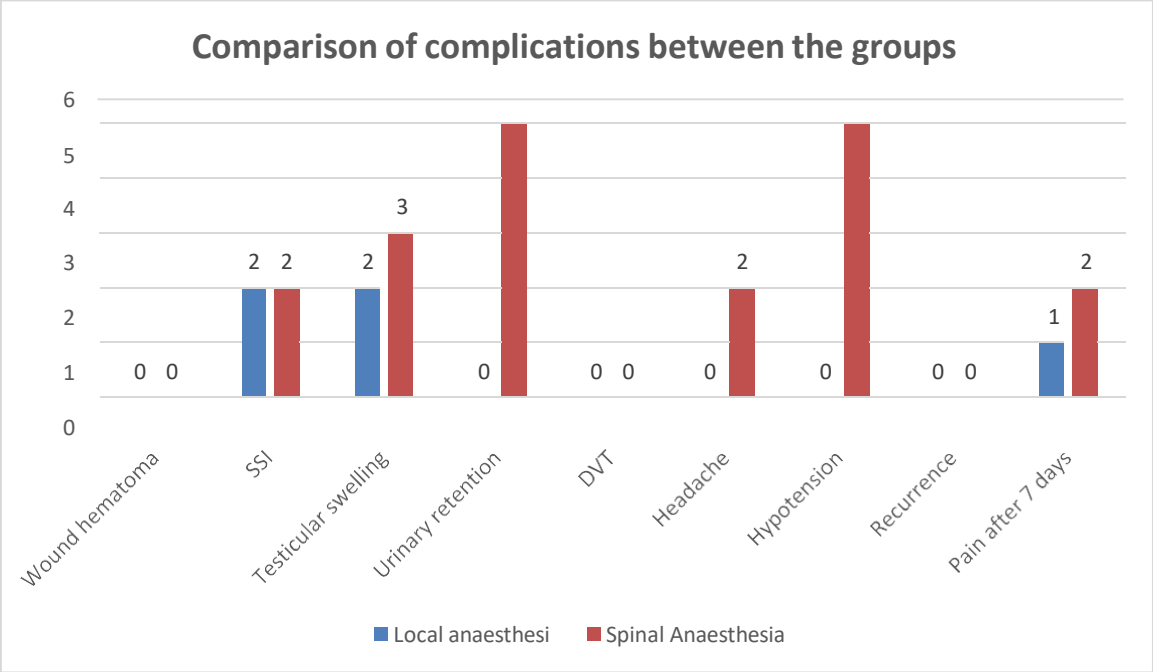

Figure 2: Comparison of complications between the groups

DISCUSSION:

Due to the increasing trend of general surgeons performing day-care surgeries for inguinal hernia repair, a repair method's success and efficiency are based on its low postoperative recurrence rate, cost-effectiveness, and ability to achieve a low level of pain after surgery.5,6 With the use of local infiltration of anaesthetic agents, the compulsory need for cardiac fitness and evaluation for elderly patients can be scaled down. The benefit of same-day discharge in day care surgery enhances the cost-effectiveness of using local anesthesia for inguinal hernia surgery. However, administering local anesthesia involves multiple needle pricks, which is a disadvantage. While local infiltration blocks pain sensation, patients may still feel discomfort from the traction on tissues. For nervous individuals, some sedation may be necessary during the procedure, which reduces the advantages of using local infiltration as a whole by reducing the need for further anaesthetics. Overly worried, tense, and restless patients would not be good candidates for surgery under local anaesthesia.

In the present study, the average age of 60 patients included in the study was 42.14±4.61yrs, with 32 patients having left sided Inguinal hernia and 28 patients having right sided Inguinal hernia. There was no significant difference in the mean age between the two groups. Similar to this result, in a study by Song et al., there was no discernible difference in the mean age between the groups receiving spinal and local anesthesia—42 and 39 years, respectively. 7

The mean VAS score was found to be much lower in the local anaesthesia group than in the spinal anaesthesia

group. ($p<0.05$) The findings were similar to those of Song D et al., who demonstrated that individuals who underwent local anaesthesia had a lower VAS score than those who underwent spinal anaesthesia.7

The present study also documented a higher incidence of hypotension, headache and urinary retention in comparing the spinal anaesthesia group to the local anaesthesia group ($p<0.05$) The patients were free from complications associated with administration of spinal anesthesia like urinary retention, post dural puncture headache and hypotension. These results are similar to the findings of Van Veen et al.8 Postoperative pain is one of the most troublesome complications encountered in open inguinal hernia repair. Our research demonstrates that when local infiltration anesthetic is used during surgery, there is a considerable reduction in early postoperative discomfort.

According to the current study, the group receiving local anaesthesia had a lower mean postoperative hospital stay, which is consistent with findings from Subramaniam P et al., Nordin P et al., and Goel A et al.9–11 When a patient is admitted to the hospital, the attenders of the patient have to stay in the hospital which disturbs the general quality of life. The usage of local anaesthesia infiltration allows the patient to return to normal activities and thus, family life, sooner.

Recovery from anesthesia is also better for the patients of local anaesthesia group as they were mobilised immediately after surgery which also decreases the risk of thromboembolism.12 In terms of cost effectiveness, Local anaesthesia is found to be better as it eliminates the need for an anaesthetist, further reducing the cost of the procedure.

CONCLUSION

We conclude that open inguinal hernia repair performed with local infiltration field block anaesthesia is as safe and effective as spinal anaesthesia, with the added advantages of shorter hospital stays, reduced post-operative pain and no spinal anaesthesia related complications. It is a cost-effective and a practical alternative to spinal anesthesia for fast-track ambulation in cases managed by open inguinal hernia repair, even in older age group and debilitating patients.

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