

EFFICACY OF LOCAL VERSUS SPINAL ANAESTHESIA FOR MESH INGUINAL HERNIOPLASTY IN TERMS OF POSTOPERATIVE PAIN

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ABSTRACT

Objectives: To determine the efficacy of local versus spinal anaesthesia for mesh inguinal hernioplasty in terms to postoperative pain.

Methodology: This study was conducted at Surgical D Unit, Lady Reading Hospital Peshawar. Study design was randomized control trial duration of the study was six months in which a total of 82 patients (41 in each group) were observed by using 79% proportion of pain in local and 99% proportion of pain in spinal. 95% confidence level and 90% power of test under WHO software for sample size determination. More over non probability consecutive sampling technique was used for sample collection.

Results: In this study mean age in Group A (local anaesthesia) was 30 ±6.47 years and in Group B (spinal anaesthesia) the mean age was 31 ±6.98 years. All the patients in both the groups were male. In Group A (local anaesthesia) 71% patients didn't had pain while 29% patients had pain. Where as in Group B (spinal anaesthesia) 61% patients didn't had pain and 39% patients had pain. Hence on the basis of pain local anaesthesia was effective in 71% patients and spinal anaesthesia was effective in 61% patients.

Conclusion: Local anaesthesia was more effective than spinal anaesthesia for mesh inguinal hernioplasty in terms of postoperative pain.

Key Words: Local anaesthesia, Spinal anaesthesia, Mesh inguinal hernioplasty, Pain

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INTRODUCTION

Protrusion of a viscous or its part through an abnormal opening in the walls of its containing cavity in which it is contained is described as a hernia¹. Elective inguinal hernia repair is one of the most commonly performed surgery worldwide². The basic principle of hernia repair is a tension free repair. The major advances in hernia repair include the introduction of the concept of tension free repair with the use of prosthetic materials and also more recently laparoscopic total extra-peritoneal repair for hernia. Lichtenstein hernioplasty is simple, effective and easy to learn and has low recurrence rate than laparoscopic mesh repair^{3,4}. There is minimal postoperative pain due to decreased tension on tissues and is associated with low recurrence rate⁵. Lichtenstein hernioplasty can be performed under local, general or spinal anaesthesia¹.

Spinal anaesthesia has advantage of full work up of the patient. While it has disadvantages of long hospital

stay, postoperative cardiovascular & urinary complications and is more expensive⁶. Local anaesthesia is cost effective, technically easy, apparently safer, rapid in onset, has less post operative cardiovascular complications, short anaesthesia time, and helpful in decreasing the surgical list load. The other major benefit is postoperative pain relief as it has quick but long lasting effect⁷. With local anaesthesia, the patient is fully awake and can move about which reduces the hospital stay. Due to early mobility, the postoperative convalescence period is reduced and most of the patients can resume their work within a week. Local anaesthesia especially in the elderly and moribund patients can be preferred as it avoids the systemic effects associated with general, spinal and regional anaesthesia. The other beneficial aspect of local anaesthesia is the independence of surgeons from anaesthetist. Disadvantages of local anaesthesia are, large doses may lead to toxicity and some sedation may be required during the operation for anxious patients.

Lichtenstein hernioplasty, performed under local anaesthesia, is a simple technique to be learned and trained surgical residents are able to perform it without compromising the patient's care and long-term outcome. Several retrospective and randomized controlled trials have shown that local anaesthesia provides the best clinical and economic benefits to patients. The use of local anaesthesia results in increased day-case rates, lower postoperative analgesic requirements and fewer micturition problems as compared to spinal anaesthesia⁶.

Choice of anaesthesia for patients undergoing inguinal mesh hernioplasty varies from country to country and institution to institution. Use of local anaesthesia for inguinal mesh hernioplasty varies from 7% to 79%, depending upon country and hospital practice. In UK regional anaesthesia is employed in 10-20% of cases while in specialist centers local anaesthesia is employed in all cases to achieve 100% day case rates. Spinal anaesthesia for inguinal mesh hernioplasty has been employed from 57% to 96% of cases⁸. Similarly in other studies it was found that in the year between 2005 and 2010 the mesh repair under local anaesthesia surged from 2.1% to 61.2% (7.7 fold), while spinal anaesthesia increased from 4.2% to 20.6% (4.9 fold). Studies show significant variability in time and setting therefore further studies are needed to get to conclusive statistics⁹. Post-operative pain experienced by patient resulting in demand of analgesia is significantly lower in patients undergoing inguinal mesh hernioplasty under local anaesthesia compared with spinal anaesthesia. 79% of patients required analgesia in local anaesthesia group compared with 99% patients in spinal anaesthesia and they also found that mean total analgesic consumption in milligram was 7mg in local anaesthesia while 16.60 mg in spinal anaesthesia.⁷ In another study conducted at Department of Surgery, Liaquat University, Jamshoro Sindh, Pakistan from January 2008-2009 it was found that inguinal hernia repair under local anaesthesia is safe and convenient. It was found that 28% of patients complained of post-operative pain, therefore making inguinal repair under local anaesthesia a safe and convenient method¹⁰.

This study was designed to compare the efficacy of local and spinal anaesthesia for mesh inguinal hernioplasty in order to get to possible and real statistics of both spinal anaesthesia and local anaesthesia. The primary aim was to compare the any differences in post-operative pain. The secondary aims were to compare hospital stay and patient satisfaction. It will help to decrease the financial burden, hospital stay of the patients and work load of the medical team.

METHODOLOGY

This study was conducted at Surgical D Unit, Lady Reading Hospital Peshawar. Study design was comparative analytic and duration of the study was six months in which a total of 82 patients (41 in each group) were observed by using 79% proportion of pain in local⁷ and 99% proportion of pain in spinal anaesthesia⁷. 95% confidence level and 90% power of test under WHO software for sample size determination. Non-probability consecutive sampling technique was used for sample collection. More over patients with age 20-40 years, only male patients with unilateral, reducible and incomplete inguinal hernia were included while patients with obstructed hernia, recurrent hernia, strangulated hernia and patients with co-morbid factors were excluded. Eighty two patients with diagnosis of inguinal hernia fulfilling inclusion criteria were registered in Surgical D Unit, Lady Reading Hospital, Peshawar. Patients were explained about the nature of research and an informed consent was obtained in all cases. The demographic information and variables like name, age, sex, and address was collected through a proforma. Included patients were randomly allocated in two groups: group A and group B. Randomization was done by "pull en envelope method". Forty one patients in Group A had received local anaesthesia & forty one patients in Group B had received spinal anaesthesia.

Local anaesthesia was administered by surgeon and the agents which were used are 2% lidocaine and 0.5% bupivacaine with 1: 100,000 adrenaline. Local anaesthesia was given step wise as 1: Subdermic infiltration (approximately 5 ml of the mixture is infiltrated along the line of the incision). 2: Intradermic injection ;making of the skin wheal (the needle previously inserted into the subdermic plane was slowly withdrawn until the tip of the needle reaches the intradermic level. At this point, without extracting the needle completely, the intradermic infiltration and making of the skin wheal was performed by very slow injection of approximately 3ml of the mixture along the line of the incision). 3: Subcutaneous injection (10 ml of the mixture was injected deep into the subcutaneous adipose tissue by vertical insertions of the needle 2cm apart). 4: Subfascial Infiltration (approximately 8 to 10 ml of the anaesthetic mixture was injected immediately underneath the aponeurosis of the external oblique through a window created in the subcutaneous adipose tissue at the lateral corner of the incision). 5: Pubic tubercle and hernia sac injection (occasionally, infiltration of a few milliliters of the mixture at the level of the pubic tubercle, around the neck and inside the indirect hernia sac, was required to achieve complete local anaesthesia).

Spinal anaesthesia was given by the anaesthetist according to the standard procedure and the agent was 0.5 % Bupivacane / 0.75% Abocaine. Outcome in the form of post operative pain through the pain scale

and it was assessed 2 hour after surgery, hospital stay in terms of days to stay in the ward after surgery. Post op pain and hospital stay duration was checked. All this information was collected through a designed proforma. Confounding factors had been addressed in inclusion and exclusion criteria. The data collected from the patients through Performa's was entered in SPSS latest version. Mean \pm SD was calculated for continuous variable like age and duration of hernia. Frequencies and percentages were calculated for categorical variable like efficacy. Chi-square test was applied to compare the efficacy in both the groups. P-value < 0.05 was considered as significant.

RESULTS

In this study a total of 82 patients (41 in each group) were observed. In group A (local anaesthesia) mean age was 30 ± 6.47 years while in group B (spinal anaesthesia) mean age was 31 ± 6.98 years as shown in table 1. All the patients in both the groups were male. Duration of hernia is shown in table 2. In group A (local anaesthesia) 29(71%) patients didn't had pain. Status of pain and pain score are shown in Table 3. Local anaesthesia was effective in 29(71%) patients while spinal anaesthesia was effective in 25(61%) patients as shown in table 4.

DISCUSSION

Inguinal hernia repair is one of the most common surgical procedures. The incidence of intraoperative postoperative pain, morbidity, hospital stay and cost is related to the type of anaesthesia employed. The studies are therefore focused on finding the appropriate anaesthesia to reduce all of the above. Surprisingly there is little consensus today on the choice of anaesthesia. Current data reflects a large variation in the anaesthesia practices, which are mainly based on the preferences of the surgeon and the anaesthetist rather than evidence based.

Our study shows that in group A (local anaesthesia) 71% patients didn't had pain while 29% patients had pain. Where as in Group B (spinal anaesthesia) 61% pa-

tients didn't had pain and 39% patients had pain. Hence on the basis of pain, local anaesthesia was effective in 71% patients and spinal anaesthesia was effective in 61% patients. Similar results were found in another study done by Farooq et al⁹ showing local anaesthesia was effective in 65% patients and spinal anaesthesia was effective in 60% patients in term of pain.

In the study by Bahrooz et al¹¹, local anaesthesia was effective in 70% patients and spinal anaesthesia was effective in 65% patients in term of pain. The use of local anaesthesia varies from 7% to 79% depending on the country and whether it is carried out in a specialist centre or general surgical unit¹². Similar results were observed by Ruben et al¹³ in which local anaesthesia was shown to effectively blocks surgical stress, provides extended post-operative analgesia and it is simple to execute. It is safe even in high risk patients. Additionally it enables early mobilization and discharge without the need for extended monitoring.

Similar findings were observed by Henzi et al¹⁴ in which local anaesthesia did not shorten the operative time. It was, however, associated with shorter stay in recovery room and was significantly less demanding on post-operative monitoring. The reason why a shift to local anaesthesia is not in line with RCS guidelines is perhaps because anaesthetists are more comfortable with the techniques of general anaesthesia, spinal anaesthesia or local anaesthesia. This also explains why only 15% of surgeons offer the majority of their patients local anaesthesia repair.

Sanjay et al¹⁵ had shown that the commonly perceived problem with local anaesthesia in hernia repair is the pain of infiltration which can be extreme enough for the patient to decline further surgery in local anaesthesia forcing conversion to general anaesthesia. Our own experience, which is shared by others, is that buffered local anaesthesia solution is associated with a high level of patient satisfaction. Discomfort with local anaesthesia can be further minimized by pre-warming the local anaesthesia solution and a slower rate of infiltration. Sanjay et al¹⁵ achieved excellent patient satisfaction with local anaesthesia using these measures, with none of the pa-

Table 1: Age distribution (n=82)

Age	Group A Local Anaesthesia	Group B Spinal Anaesthesia
21 – 25 years	5(12%)	5(12%)
26 – 30 years	13(32%)	13(32%)
31 – 35 years	15(37%)	14(34%)
36 – 40 years	8(20%)	9(22%)
Total	41	41
Mean and SD	30 \pm 6.47 years	31 \pm 6.98 years

Table 2: Duration of hernia (n=82)

Duration	Group A Local Anaesthesia	Group B Spinal Anaesthesia
3-4 months	14(34%)	15(37%)
5-6 months	27(66%)	26(63%)
Total	41	41
Mean and SD	5 months \pm 2.61	6 months \pm 3.02

Table 3: Status of pain after 2 hours (n=82)

Status of pain	Group A Local Anaesthesia	Group B Spinal Anaesthesia	P value	
No Pain	29(71%)	25(61%)	0.4833	
Pain	< 3 score	9(22%)		10(24%)
	>3 score	3(7%)		6(15%)
Total	41	41		

Table 4: Efficacy (n=82)

Efficacy	Group A Local Anaesthesia	Group B Spinal Anaesthesia	P value
Effective	29(71%)	25(61%)	0.8677
Not Effective	12(29%)	16(39%)	
Total	41	41	

tients requiring conversion to general anesthesia. A potential problem of toxicity of local anesthesia in obese patients was avoided by local anesthesia mixture used in his study where large volumes were necessary for such patients.

The benefit of local anesthesia before hernia surgery has been investigated by Walder et al¹⁴. They found both constant and incident pain to be less severe for up to forty-eight hours post-operative compared to those who received no local anesthesia. These findings were confirmed by our study showing lower analgesic usage. This decreased post operative nausea and vomiting leading to shorter hospital stay in group A. In a review by van Veen et al¹³ 52% cases of local anesthesia had hospital stay of <1 day while 58% of spinal anesthesia and general local anesthesia had hospital stay of >1 day. In this study, amongst the patients of group A 80% had hospital stay of <1day while 98% of group B patients had hospital stay of > 1day.

CONCLUSION

The results of using local anaesthesia was insignificant but with advantage of better postoperative pain control after inguinal hernia repair than spinal anaes-

thesia. It also showed that fewer dosages of postoperative narcotic analgesic were required after Lichtenstein repair of inguinal hernia, to keep the patients pain free in local versus spinal anaesthesia.

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CONTRIBUTORS

FKU conceived the idea, planned the study, and drafted the manuscript. MK and MH helped acquisition of data and did statistical analysis. All authors contributed significantly to the submitted manuscript.