

Effectiveness of Local Anaesthesia for Postoperative Analgesia Requirement for Lichtenstein Hernia Repair—A comparative study

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ABSTRACT

Objective: To compare the postoperative analgesia requirement in Lichtenstein repair under local versus spinal anaesthesia.

Study design: Randomized clinical trial.

Setting: Department of Surgery Jinnah Hospital, Lahore from 15th May 2009 to 14th November 2010.

Data collection: The study included 200 patients divided randomly in two equal groups. Patients in group A were subjected to local anaesthesia while patients in group B were subjected to spinal anaesthesia. The main outcome measure was pain relief which was measured in terms of analgesia requirement after the procedure. The patients were followed till they felt comfortable to be discharged on oral analgesia.

Results: Postoperative opioid analgesia was required by 79% patients of LA as compared to 99% of SA and marked difference in total requirement.

Conclusion: Local infiltration for Lichtenstein hernioplasty showed better results and good efficacy as compared to spinal anaesthesia and it didn't have the adverse effects of spinal anaesthesia (i.e. failure, urinary retention, spinal headache and longer hospital stay).

Key words: Lichtenstein repair, local anaesthesia, spinal anaesthesia.

INTRODUCTION

The estimated incidence of inguinal hernia is 10-15%. Despite the frequency of surgical repair, "perfect results" continue to elude surgeons and the rate of surgical failure (recurrence) is humbling^{1, 4}. Although inguinal hernia repair is one of the most commonly performed operations worldwide, however, there is no common consensus among surgeons regarding the best choice of anaesthesia^{3,5}.

Local Anaesthesia for groin hernia repair was first proposed by Cushing on the basis of a study initiated by Halsted more than 100 years ago. Local anaesthesia is only used in 5 to 8% of the patients^{7,8}.

The effective management of pain is a vital component of good practice for surgical patients. Unrelieved pain causes a range of physiological, neuroendocrine, psychological and behavioral consequences that may hinder recovery⁶. Early post-operative pain is reduced when local infiltration anaesthesia is used¹⁷. It is documented that the effect of long-acting local anaesthetics like bupivacaine lasts for 4 to 6 hours which is significantly longer as compared to spinal

anaesthesia^{12,13}.

Patients undergoing groin hernia repair under local anaesthesia have significantly less pain and only 8% patients needed post-operative opioid analgesics in local anaesthesia as compared to 22% in spinal anaesthesia^{10,14} and local Anaesthesia is considered the anaesthetic method of choice in specialized hernia centers^{9,11}. Among the reported advantages are simplicity, safety, extended postoperative analgesia, early mobilization without post-anaesthesia side effects, and low cost. Considering this evidence, proposed study was designed to assess the postoperative analgesia requirement of local anaesthesia against spinal anaesthesia in Lichtenstein repair of inguinal hernia in our setup, so that, if effective, can be used more frequently.

Post-operative opioids analgesic requirement: Patient was observed for 48 hrs post-operatively or till discharge to see whether opioid analgesia was required or not, in addition to routine analgesia (i.e., diclofenac sodium 50mg BD).

Hypothesis: Local anaesthesia in Lichtenstein inguinal hernia repair is associated with less post-operative analgesia requirement as compared to spinal anaesthesia.

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MATERIALS AND METHODS

It was randomized clinical trial conducted in the Department of Surgery, Jinnah Hospital,, Lahore during period of eighteen months from 15th May 2009 to 14th November 2010. The sample size was 100 cases in each group with 8% margin of error, 80% power of study taking expected percentage of analgesia requirement i.e., 8% in local anaesthesia and 22% in regional (spinal) anaesthesia. All patients between ages 20-60 years with clinically diagnosed both direct and indirect inguinal hernia and were planned to undergo Lichtenstein inguinal hernia repair were included in the study. However, patients with clinically Strangulated, Bilateral or recurrent inguinal hernia were excluded. Non-probability, purposive sampling was done.

All the patients presenting in the department of surgery through out patient department, fulfilling the selection criteria were included in the study. An informed consent was obtained from them after discussion of risk versus benefit ratio. Patients were divided in two groups by the help of random number table; Group A, comprising of 100 patients, received local anaesthesia. The anaesthetic mixture used for local anaesthetic repair consist of 20ml of 2% xylocaine with 1:200,000 adrenaline, 30ml of 0.5% bupivacaine with 1:200,000 adrenaline and 50 ml of 0.9% saline. To buffer the lignocaine, 6 ml of 8.4% sodium bicarbonate was added, giving a pH of 7.0. Anaesthetic mixture was injected along the line of proposed incision, 2cm above and medial to anterior superior il/Ac spine deep to external oblique. Further anaesthetic mixture was injected under the external oblique around the neck of sac during operation. In addition, midazolam in a dose of 0.1mg/kg was used for sedation. Group B comprising of 100 patients, received spinal anaesthesia with 2ml of inj. bupivacaine 0.75 %(15mg). Cephadrine 500mg I/V was given at time of induction of anesthesia. In both groups Lichtenstein repair was performed. The time of arrival in postoperative ward was defined as zero. Diclofenac sodium 50mg twice a day was given to all the patients. Narcotic analgesics (nalbuphine) was given on request and was mentioned as Yes/No. Other variable i.e. total dose of narcotic analgesia in each group was also noted.

All the collected information from the proforma was entered into S.P.S.S. version 11 and was analyzed through its statistical package. Mean and standard deviation of age was calculated in both the groups. Frequencies and percentages of sex and opioid analgesia requirement were calculated and were presented in the form of tables. Analgesic requirement was compared between the two groups

by using chi-square. P-value ≤0.05 was considered as significant.

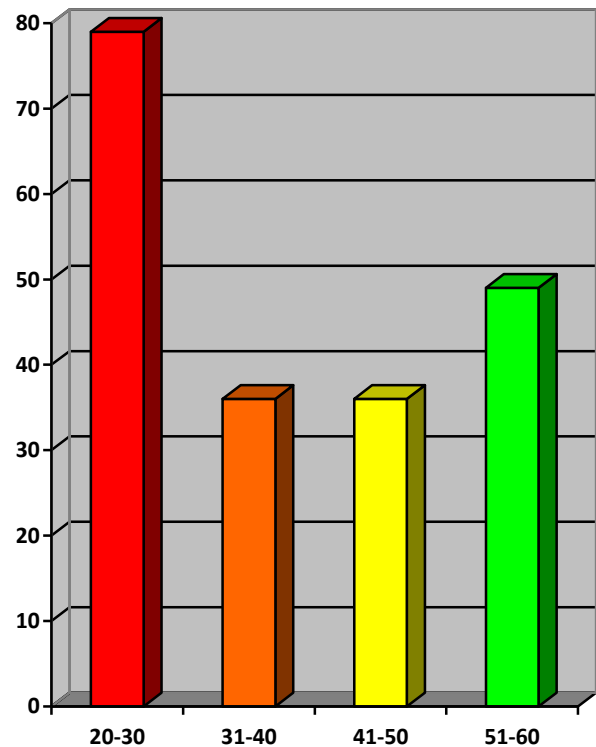
RESULTS

Two hundred patients were divided in two equal groups. Lichtenstein repair was done in all cases and diclofenac sodium given twice a day by intramuscular route. Local infiltration of inguinal field was used in group A while in group B spinal anaesthesia was employed. In both groups narcotic analgesia was given on patient’s demand till the patient felt comfortable to be discharged on oral analgesia. Most of the patients in our study were of young age group between 20-30 (Fig.1).

Comparison of hospital stay of the patients showed 80% of group A patents had hospital stay of 1 day while 98% of group B patients had hospital stay of more than 1day (i.e., 88% 2 days and 10% 3days) (Fig. 2).

Comparison of opioid analgesia requirement showed that 79% of patients in group A required opioid analgesics as compared to 99% of group B (p-value >0.05) (Table 1).

Fig. 1: Age break down of patients with inguinal hernia



Mean age= 38.83
 Median= 38
 Standard Deviation = ±13.82

Fig. 2: Postoperative stay

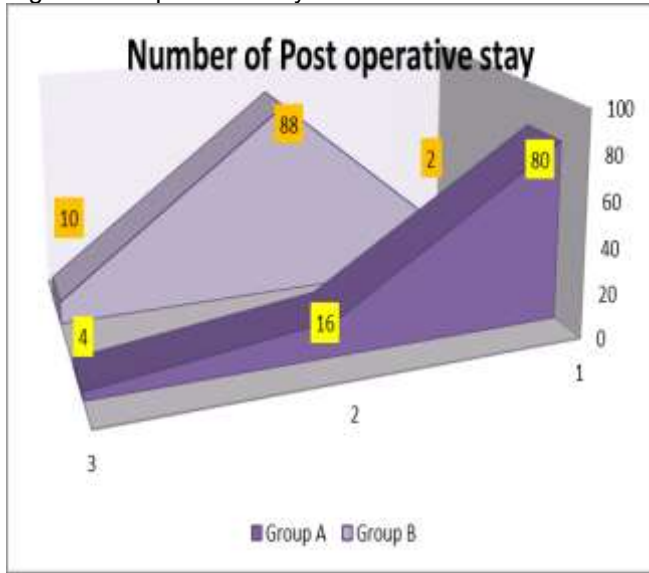


Table 1: Distribution according to opioid analgesia requirement

| Analgesia Requirement | Group A | Group B |
|-----------------------|---------|---------|
| Yes | 79 | 99 |
| No | 21 | 01 |
| Total | 100 | 100 |

Table 2: Total Analgesia Consumption in mgs

| Group | Mean | N | Std. Deviation |
|---------|-------|-----|----------------|
| Group A | 7.00 | 100 | 4.323 |
| Group B | 16.60 | 100 | 4.866 |
| Total | 11.80 | 200 | 6.651 |

DISCUSSION

Inguinal hernia repair is one of the most common surgical procedures. It can be performed under GA, SA or L/A. The incidence of intraoperative postoperative pain, morbidity, hospital stay and cost is related to the type of anesthesia employed. The studies are therefore focused on finding the appropriate anesthesia to reduce all of the above.

Surprisingly there is little consensus today on the choice of anesthesia. Current data reflects a large variation in the anesthesia practices, which are mainly based on the preferences of the surgeon and the anesthetist rather than evidence based.

The use of L/A varies from 7% to 79% depending on the country and whether it is carried out in a specialist centre or general surgical unit. In the UK 60% to 70% percent of cases are still being performed under general anesthesia, with regional anesthesia employed in only 10-20% of cases. Specialist Hernia centers employs L/A in almost all cases to achieve 100% day case rates⁵.

Several studies indicate that that LA for inguinal hernia repair 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^{2,15}.

In this study, as well as others, L/A 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 L/A is not inline with RCS guidelines is perhaps because anesthetists are more comfortable with the techniques of GA and SA than L/A⁵. This also explains why only 15% of surgeons offer the majority of their patients L/A Repair⁵.

The commonly perceived problem with L/A in hernia repair is the pain of infiltration which can be extreme enough for the patient to decline further surgery in L/A forcing conversion to GA. Our own experience, which is shared by others, is that buffered LA solution is associated with a high level of patient satisfaction. Discomfort with LA can be further minimized by pre warming the L/A solution and a slower rate of infiltration⁵. We achieved excellent patient satisfaction with L/A using these measures, with none of the patients requiring conversion to GA. A potential problem of toxicity of L/A in obese patients was avoided by L/A mixture used in this study where large volumes were necessary for such patients.

The benefit of L/A before hernia surgery has been investigated by Tuerskoy et al²². 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 L/A. Callase and Kehlet also found decreased post operative pain and analgesia usage in L/A^{15,24}. 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 Sanjay 52% cases of LA had hospital stay of < 1day while 58% of SA and GA had hospital stay of > 1day^{5,16}. In our study, amongst the patients of group A 80% had hospital stay of <1day while 98% of group B patients had hospital stay of > 1day.

With increasing life expectancy the number of elderly patients with inguinal hernia repair is increasing. This group is more likely to have concurrent diseases and therefore more susceptible to SA or GA related complications, especially cardiovascular complications as well as urinary retention and spinal headache. All these increase hospital stay and cost of treatment¹⁸. In our study nine patients in group B developed urinary retention

and 4 of them required catheterization. Incidence of retention can be as high as 27% with SA leading to prolonged stay^{19,21}. There was no incidence of urinary retention in group A.

In conclusion this study provides evidence that L/A is feasible in most cases of inguinal hernia repair and is superior to SA. Besides being cost effective, L/A provides highly satisfactory intraoperative analgesia, less post operative pain^{20,23}, no urinary retention and faster mobilization and recovery. It also reduces burden on anesthesia and other OT staff. The reluctance of surgeons to offer L/A can be overcome by increasing awareness of and demonstrating the techniques of L/A administration in workshops.

CONCLUSION

The results of using local anaesthesia with mixture of Xylocaine and Bupivacaine were insignificant but with advantage of better postoperative pain control after inguinal hernia repair than spinal anaesthesia. 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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