

Inguinal hernia repair in local anaesthesia; Experience of a tertiary care hospital

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Objective:

To compare mean postoperative groin pain in local anesthesia v/s spinal anesthesia in patients undergoing inguinal hernia repair.

Study Design: Randomized control trial.

Place and duration of study: The study was conducted at Department of General Surgery, JPMC From 6th September 2014 to 5th March 2015.

Material and Methods: Total 140 patients who were diagnosed as having inguinal hernia were included in the study. Patients were randomly allocated to two groups, Group A (local anesthesia) and Group B (spinal anesthesia). All patients were received the standard flat mesh repair. Patients were discharged in the same evening and followed up in OPD at 1st, 8th, and 30th days after surgery and assessed for intensity of pain at rest. Final outcome was assessed at day 30th. Data was analyzed using SPSS version 21.0.

Results: The overall mean age of study subjects was 42.91 ± 10.64 years, with range of 41 (19–60) years. In local anesthesia group the mean groin pain at day-1 was 0.83 ± 0.38 , at day-8 it was 0.66 ± 0.47 , and at day-30 it was 0.09 ± 0.28 . In spinal anesthesia group the mean groin pain at day-1 was 1.20 ± 0.43 , at day-8 it was 0.96 ± 0.20 , and at day-30 it was 0.40 ± 0.49 . In local anesthesia group the mean groin pain in indirect inguinal hernia was 0.08 ± 0.27 and 0.10 ± 0.30 in direct inguinal hernia. In spinal anesthesia group the mean groin pain in indirect inguinal hernia was 0.43 ± 0.50 and 0.25 ± 0.45 in direct inguinal hernia.

Conclusion: In conclusion, it can be suggested that Inguinal hernia repair under local anesthesia is safe, simple, effective, economical, less post operative complications and long postoperative analgesia.

Keywords: inguinal hernia repair, postoperative groin pain, local anaesthesia, spinal anaesthesia

Introduction

Hernia is derived from the Latin word for rupture.¹ Although a hernia can occur at various sites of the body, these defects most commonly involve the abdominal wall, particularly the inguinal region.^{1,2} Hernia surgery should be approached according to a technique as simple and safe as possible that is at the same time accepted by the patient and easily realizable by the surgeon.⁵⁻⁷ The Lichtenstein tension free mesh repair has opened a new era in groin hernia repair. The choice of anesthetic technique for inguinal hernia repair depends on several factors, including patient and surgeon preferences, feasibility of the technique, intra- and post-operative pain

control, recovery time and monitoring requirements, post-operative morbidity and costs.⁸

Inguinal hernia repair can be performed by using a variety of anaesthetic techniques such as, general anaesthesia, regional anaesthesia in the form of spinal or epidural anaesthesia, paravertebral block and local anaesthesia.⁹ Spinal anaesthesia for hernia repair has attained a widespread popularity due to the advantages of an awake patient and minimal drug and equipment costs. However, the technique may be burdened by a risk (albeit low) of post-spinal headache, undesirable hemodynamic responses and urinary retention. The competitors are the newer

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general anaesthetic agents which are simple to administer, safe and allowing very fast recovery, and local infiltration anaesthesia which is simple, and the most cheap and safe technique and with the fastest recovery.¹¹ Based on these considerations, we may question the routine use of spinal anesthesia for inguinal hernia repair. In the light of the simplicity, fast recovery and lower morbidity with local infiltration anesthesia and the newer general anesthetic techniques, we suggest that the choice of anesthesia for inguinal hernia repair stands between these two techniques.⁸

According to recent guidelines of the European Hernia Society, published on "Hernia" in 2009, treatment of a hernia in primary selection can always take advantage of local anesthesia. This is a grade A recommendation, with high scientific impact.^{5,13,14} Several retrospective and randomised controlled trials have shown that local anaesthesia provides the best clinical and economic benefits to patients.^{3,15-17} Studies comparing the recovery profiles of local, general and regional anaesthesia show that local anesthesia is ideal for day care surgery.⁴ Local anaesthesia provides increased safety for patients, better postoperative pain control, shorter recovery period with reduced duration of hospital stay and reduced cost.^{10,18-24}

The rationale of the study is to recommend an option of local anesthesia for hernia repair if it will be proven superior or shown no difference in groin pain postoperatively as compared to spinal anesthesia. The study will help to choose a procedure of inguinal hernia repair in our setup that causes less post operative pain and has less complications.

Methodology:

This study was conducted in Department of General Surgery, Jinnah Postgraduate Medical Centre, Karachi from 6th September 2014 to 5th March 2015 after approval from institute ethical committee. Estimated sample size was at least $n=70$ in each group and the total sample size was at least $n1+n2=140$.

Non-probability consecutive sampling was used

for the study and it was a randomized control trial. The patients who fulfilled inclusion criteria were included in our study. Patients were admitted through out patient department of Surgery department of Jinnah Postgraduate Medical Center, Karachi and were operated after taking anesthesia fitness and written and informed consent. The patients were randomly allocated to two groups, Group A (patients had local anesthesia) and Group B (patients had spinal anesthesia) based on random numbers drawn from computer. The method of using visual analogue scale (VAS) was explained to the patients preoperatively. All the patients were received the standard flat mesh repair according to the technique describe by Lichtenstein et al. The surgical team was headed by a consultant with at least 5 years post fellowship experience and assessed by the researcher herself.

Simultaneously, the patients were managed in a standard clinical pathway postoperatively and discharged in the same evening and was followed up in OPD at 1, 8 and 30 days after surgery. Each group was assessed at 1, 8 and 30 days after surgery for intensity of pain at rest upon completion of various activities (coughing, walking up 3 flights of stairs, and cycling for 10 minutes) were assessed on visual analogue scale at 1st, 8th and 30th day of surgery and it was assessed in terms of mean and standard deviation. Final outcome was assessed at day 30.

Patients were also requested to fill in a questionnaire regarding pain or discomfort encountered during normal daily activities at home. Data regarding pain and other demographic information were collected through structured proforma. A database was developed on statistical package of social sciences (SPSS) version 21 through filled in proforma's. Mean \pm SD were calculated for age and post operative pain at day 1, 8 and 30. Frequency and percentage were calculated for type of hernia (direct or indirect). Student t-test was applied to compare post operative pain score at day 1, 8 and finally at day 30 in both groups, taken $p \leq 0.05$ as significant. Confounder were controlled through stratification of age and type of inguinal hernia to see the

Table 2: Descriptive statistics of postoperative groin pain in local anesthesia group (n=70)

	DAY-1	DAY-8	DAY-30
Mean ±SD	0.83±0.38	0.66±0.47	0.09±0.28
95%CI (LB –UB)	0.74 –0.92	0.54 –0.77	0.02 –0.15
Range	1	1	1
Minimum	0	0	0
Maximum	1	1	1

Table 3: Descriptive statistics of postoperative groin pain in spinal anesthesia group (n=70)

	DAY-1	DAY-8	DAY-30
Mean ±SD	1.20±0.43	0.96±0.20	0.40±0.49
95%CI (LB –UB)	1.10 –1.30	0.91 –1.01	0.28 –0.52
Range	2	1	1
Minimum	0	0	0
Maximum	2	1	1

Table 4: Comparison of postoperative mean groin pain in local and spinal anesthesia groups at day-30

	Local anesthesia	Spinal anesthesia
Mean ±SD	0.09±0.28	0.40±0.49
95% CI (LB –UB)	0.02 –0.15	0.28 –0.52
Range	1	1
Minimum	0	0
Maximum	1	1

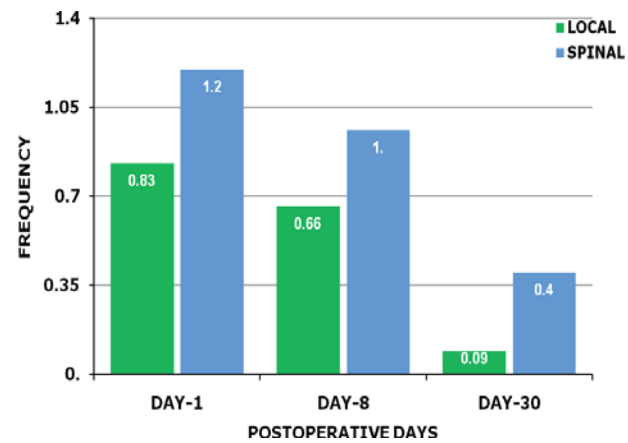
Table 5: Comparison of postoperative mean groin pain in local and spinal anesthesia groups at day-30 according to type of inguinal hernia

	Local anesthesia		Spinal anesthesia	
	Indirect (n=50)	Direct (n=20)	Indirect (n=58)	Direct (n=12)
Mean ±SD	0.08±0.27	0.10±0.30	0.43±0.50	0.25±0.45
95%CI (LB –UB)	0.00 –0.16	0.04 –0.24	0.30 –0.56	0.04 –0.54
Range	1	1	1	1
Minimum	0	0	0	0
Maximum	1	1	1	1

effect of these on outcome variable i.e. at day 30. Post stratification applied student t-test taken $p \leq 0.05$ as significant.

Results:

Total 140 male patients were evaluated. The overall mean age of study subjects was 42.91 ± 10.64 years, with range of 41(19–60) years. The age



Graph.1: Post operative mean vas score at day-1, day-8, and day-30 in local and spinal anesthesia groups

was stratified in groups. 60(42.9%) patients were ≤ 42 years of age and 80(57.1%) patients were > 42 years of age. The mean postoperative groin pain of study subjects was calculated at day-1, day-8, and day-30 in local and spinal anesthesia groups. In local anesthesia group the mean groin pain at day-1 was 0.83 ± 0.38 , at day-8 it was 0.66 ± 0.47 , and at day-30 it was 0.09 ± 0.28 . The detailed descriptive statistics is presented in Table-2. In spinal anesthesia group the mean groin pain at day-1 was 1.20 ± 0.43 , at day-8 it was 0.96 ± 0.20 , and at day-30 it was 0.40 ± 0.49 . The detailed descriptive statistics is presented in Table-3. The comparison of mean groin pain in both groups at day-1, day-8, and day-30 is also presented in Graph-1. The comparison of groin pain at final day i.e. day-30 among both local and spinal anesthesia group is also presented in Table-4.

In local anesthesia group the mean groin pain in indirect inguinal hernia was 0.08 ± 0.27 and 0.10 ± 0.30 in direct inguinal hernia. In spinal anesthesia group the mean groin pain in indirect inguinal hernia was 0.43 ± 0.50 and 0.25 ± 0.45 in direct inguinal hernia. The detailed descriptive statistics is presented in Table-5. Student t-test was applied to analyze mean difference of groin pain between local and spinal anesthesia groups at day-1, day-8 and day-30. The results showed that there was highly significant difference in mean groin pain between the two groups at day-1, day-8, and day-30 with p -value ≤ 0.05 .

Stratification with respect to age and type of in-

guinal hernia was done to observe effect of these modifiers on outcome. Post stratification t-test was applied to evaluate significant difference of postoperative groin pain at day-30 between age and type of inguinal hernia among two groups. The result showed that there was significant difference in ≤ 42 years of age with $p < 0.05$. This difference is significant with age > 42 years and indirect inguinal hernia with $p < 0.01$. There was no significant difference in mean groin pain with direct inguinal

Discussion:

Inguinal hernia repair is one of the most frequently performed operations worldwide. It can be done as a day-case procedure with minimum morbidity. The choice of anesthesia for hernia repair depends on patient and surgeon preferences and the feasibility of the techniques. Some centre prefers local and spinal types of anesthesia whereas local anesthesia is popular in some others.^{25,26} In our study, we compared mean postoperative groin pain in local anesthesia v/s spinal anesthesia in patients undergoing inguinal hernia repair. The perception of pain is supported by sensory neurons (nociceptors) and neural afferent pathways.^{27,28} Post operative pain is due to traction on certain tissues particularly peritoneum, inadequate analgesia, urinary retention and wound infection. Post operative pain was scored with visual analog scale. Pain immediately after operation was assessed by dosage of analgesic consumption.

In a study it was reported that, post operative pain was recorded after operation by using visual analog scale. The mean visual analog scores at 12 hours interval, 24 hours interval and 48 hours interval were 3.32 ± 1.14 , 2.00 ± 1.00 and 0.76 ± 0.72 in group A and 4.32 ± 1.18 , 2.72 ± 1.13 and 1.04 ± 0.84 in group B respectively. The mean pain visual analog score is statistically significantly less in group A as compared to group B. In our study it was reported that, post operative pain was recorded after operation by using visual analog scale in both groups. In local anesthesia group, the mean groin pain at day-1, day-8, and day-30 was 0.83 ± 0.38 , 0.66 ± 0.47 , 0.09 ± 0.28 and in spinal anesthesia group the

mean groin pain was on day 1, day 8, and day 30, was 1.20 ± 0.43 , 0.96 ± 0.20 , and 0.40 ± 0.49 respectively. The mean pain score is statistically significantly less in local anesthesia group as compared to spinal anesthesia group. The results of our study were comparable to others studies.¹⁸ In a study it was reported that post operative pain was statistically less in patients operated under local anaesthesia.¹⁰

In a study, only two of the 26 cases performed under local anesthesia developed postoperative pain whereas 79 of 189 cases performed under spinal anesthesia developed postoperative pain.^{31,32} It was also found in our study, that the longer time in theatre associated with local anesthesia was compensated for by the significantly shorter time for anesthesia, compared with regional and general anesthesia. Postoperative side effects and prolonged hospital stay after groin hernia surgery were often related to the effects of anesthesia. Local anesthesia had much better results than did its alternatives. This is comparable with the study.³¹

Different studies recommended that local anesthesia is the preferred anesthetic technique for hernia operations of many investigators on account of more patient comfort, less postoperative analgesic requirements, side effects, better pulmonary function, reduced length of hospital stay, lower costs and shorter recovery times.³³ These advantages make local anesthesia suitable for daysurgery. The use of which has increased from 18% to 70% in the past years.³⁴

Limitation of the Study:

One of the limitations of this study is that it was conducted on a small scale and at urban environment therefore, the findings might not be generalizable to larger populations. Controls for the type and dose of anesthetic used was not evaluated. Other risk factors like voiding and mobility beyond the immediate postoperative period was also not observed. Since high risk patients were evaluated, this may not be a true reflection of the general population.

Conclusion:

Patients undergoing inguinal herniorrhaphy,

local anesthesia can be preferred to spinal and general anesthesia because of more comfort and convenience for day-case hernia repair with slightly fewer postoperative problems.

In conclusion, it can be suggested that Inguinal hernia repair under local anesthesia is safe, simple, effective, economical, less post operative complications and long postoperative analgesia. It also provides better analgesia as compared to spinal anesthesia.

Role and contribution of Authors:

Dr Rabbia Zubair, Postgraduate trainee, Ward 21, JPMC, Karachi, collected the data and helped in initial writeup.

Dr Syed Muhammad Shafqatullah, Senior registrar ward 21, JPMC, Karachi, collected the data and helped in discussion writing.

Dr Mehmooda Wasim, Consultant general surgeon and assistant professor surgery, Sir Syed Medical College and Hospital, helped in writing introduction, discussion and methodology writing.

Dr Shahid Rasul, Prof and HOD ward 21, JPMC, Karachi, went through the whole article and give the final touches to the discussions, result and conclusion.

Dr Javeria Iftikhar, Postgraduate trainee, Ward 21, JPMC, helped in collecting the references.

Dr Hassan Ahmed, Postgraduate trainee, Ward 21, JPMC, helped in the discussion writing.

Dr Naveed Khan, Postgraduate trainee, Ward 21 JPMC, helped in collecting the data and writing discussion and result.

Conflict of Interest: None

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