

ORIGINAL ARTICLE

EFFICACY OF LOCAL ANAESTHESIA IN REPAIR OF INGUINAL HERNIA

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Background: Local anaesthesia has been identified as the most favourable anaesthesia for elective inguinal hernia repair with respect to complication rate, cost effectiveness and overall patients' satisfaction. This study was conducted to determine the efficacy of local anaesthesia in inguinal hernia in terms of pain relief, wound infection and hospital stay. **Methods:** In this randomized controlled trial (RCT), 60 patients with inguinal hernia were included at the General Surgical 'B' Unit, Ayub Teaching Hospital Abbottabad. **Results:** The day-case rates were significantly higher when patients underwent surgery under LA compared to GA (82.6% versus 42.6%). The incidence of urinary retention was higher in the GA group ($p < 0.05$). There were 17 (2.9%) re-admissions overall. The reasons for re-admission included haematoma ($n=6$), severe pain ($n=4$), infection ($n=3$), fainting ($n=2$) and urinary retention ($n=2$). **Conclusion:** This study demonstrates that local anaesthesia for inguinal hernia repair has better efficacy as compared to general anaesthesia.

Keywords: General anaesthesia; local anaesthesia; inguinal hernia; Comparison

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INTRODUCTION

The ancient literature contains mention of hernias, for example, the Greek word "*hernios*" was first used by Hippocrates for hernias arising from abdominal wall.¹ The earliest reports of abdominal wall hernias date back to 1500 BC.^{2,3} The Ebers papyrus (1550 BC) contains details about the use of a truss for the management of hernia. The first evidence of operative repair of a groin hernia dates back to the first century AD. One of the early reports of surgical management of hernia mentioned reduction of hernia through the use of scrotal incision for removal of the testis along with the hernial sac followed by closure with sutures.^{2,4}

Even though the exact incidence of hernias is unknown, they are frequently encountered in medical and surgical practice.⁵ It is thought that the true prevalence of hernias might be much more than the estimate of 5% population developing a hernia anytime in their life.⁵ Hernias do not have any predilection for either sex.⁶ Three fourths of all hernias are of inguinal origin.^{5,7} Among inguinal hernias, majority (two-thirds) are indirect inguinal hernias and the remaining (one-third) hernias are direct inguinal hernias.^{5,7} Direct hernias are more common in the elderly.⁸ The inguinal hernias are frequently right-sided hernias.⁹ Inguinal hernias are more likely to be found in men as compared to women with a male to female ratio of 25:1.^{5,7} Interestingly, irrespective of the gender involvement, the most common inguinal hernias are indirect inguinal hernias^{5,7} and the indirect inguinal hernias are twice as common as direct inguinal hernias in men.^{5,7} It is very uncommon to find a direct inguinal hernia in women.^{5,7}

Factors that make an individual prone to develop an inguinal hernia include, lifting of heavy weights, obesity, long standing untreated cough with or

without chronic lung disease, excessive straining during defecation or micturition and ascites.^{5,7}

The approach to management of a hernia is mostly surgical, even if detected early, because almost all hernias progressively enlarge in size and cause discomfort with the passage of time and are potentially associated with intestinal strangulation and incarceration.¹⁰ The only exception to this rule are the patients with a short survival because of co-existent morbidity or because of severity of a co-morbid disease. Symptomatic relief can be provided in up to 30% patients with inguinal / abdominal hernia using a truss with correct measurement and fitting.

Noteworthy results have been reported for inguinal hernias repaired under local anaesthesia.⁷ In fact, it has been suggested that for elective repair of inguinal hernias, local anaesthesia should be preferred over general anaesthesia because of a reduced rate of complications, decreased costs of procedure and gross prevalence of patient satisfaction. Local anaesthesia can be used in a day care surgery (age value 18 years and above).^{5,11} When compared with general anaesthesia, no significant difference is usually found in wound complication rate. The use of local anaesthesia for the repair of inguinal hernias is connected to various benefits as well as a higher satisfaction reported by the patients after surgery.

Day care hernia can be successfully performed in one setup hospital stay and expenses of treatment on hospital resources are significantly reduced. The compliance and acceptability of the patient and ease of carrying out the procedure under local anaesthesia by surgeon is acceptable.^{12,2} The aim of this study was to determine if local anaesthesia for the repair of inguinal hernia was superior to that of general anaesthesia in terms of pain relief, hospital stay and complications rate.

MATERIAL AND METHODS

This randomized controlled trial was conducted at the General Surgical 'B' Unit, Department of Surgery, Ayub Teaching Hospital Abbottabad. After approval from local ethics committee, 60 patients with inguinal hernia were included in this study. Consecutive non-probability sampling technique was used for enrolling patients into this study. Male patients with age between 18 and 50 years of age were included in this study. Patients with bleeding disorders, history of psychiatric illness, history of recurrent inguinal hernia, and benign prostatic hypertrophy (BPH) or symptoms of BOO were excluded from the study. The diagnosis was clinical based. The patients were divided into two groups by blocked randomization by using permuted blocks of 6. Before their allocation into each group, the procedure was fully explained to the patients informing them that they could be allocated into either of the two groups. An informed consent was obtained from them for inclusion in the study and for repair of inguinal hernia under local or general anaesthesia. Group A was administered local anaesthesia and Group B was operated under general anaesthesia. All the data was collected on a *pro forma*. After relevant history, routine investigations which included complete blood count, hepatitis screening, ECG, x-ray chest posterior anterior view and abdominopelvic ultrasound patients were admitted for surgery. Local anaesthesia was performed with 0.5% lignocaine with adrenaline (using standard 1% lignocaine with 1 in 200,000 adrenaline mixed with equal volume of normal saline. Five to ten ml of this diluted solution injection in skin incision and further 5 ml into the deeper subcutaneous fat in the lateral third of the wound. A further 5 ml of local anaesthesia was deeper to external oblique aponeurosis. The peritoneum is sensitive and few ml of local anaesthesia was injected at the neck of sac before trans-fixation. Lignocaine was injected for pain relief at the end of procedure into the wound. Duration of hospital stay, complications like haematoma, urinary retention wound infection and pain occurring during hospital stay or follow up period was recorded. Follow up was done at first, third and sixth weeks after discharges. Data was analysed using SPSS version 10.

RESULTS

The mean±SD age was 34±16.21 years. The details of the age distribution of both group A and group B are shown in table-1. Body Mass index was analysed among two groups and the mean±SD body mass index (BMI) of study population was 27±4.08 kg/m² among study participants. The BMI of both Group A and Group B is detailed in table-1. ASA grading was analysed among 60 patients which shows that 43 (72%) were graded as ASA grade 1 and 2. In case of patients who underwent surgery under LA the rate of day cases

was high (82.6%), while the rate of day cases in the GA group was 42.6%. The GA group had a higher rate of retention of urine than the local anaesthesia group ($p<0.05$). The overall rate of re-admission in the study was 17 (2.9%). Patients were re-admitted for haematoma formation, severe pain at the site of incision, wound infection, fainting and retention of urine in 6, 4, 3, 2 and 2 patients respectively. Complications are tabulated in table-2. Mean hospital stay was 3±1.2 days and 6±1.6 days in LA and GA respectively ($p=0.00$) as shown in table-3 in groups.

Table-1: Characteristics of study population

Age Range	Local Anaesthesia	General Anaesthesia
20-30 Year	10 (33%)	7 (23%)
31-40 Year	18 (60%)	20 (66.6%)
41-50 Year	2 (6.6%)	3 (10%)
Total	30	30
BMI		
20-30 mg/km ²	10 (34%)	7 (23%)
31-40 mg/km ²	20 (66%)	23 (77%)
Total	30	30

Table-2: Complications during Hospital Stay

Post-operative Complications	Local Anaesthesia (n=30)	General Anaesthesia (n=30)	p-value
Haematoma	15 (50%)	7 (23%)	0.03
Urinary retention	2 (7%)	5 (17%)	
Wound infection	5 (17%)	2 (7%)	0.64
Severe Pain	2 (7%)	3 (10%)	
Moderate Pain	5 (17%)	7 (23%)	0.51
Mild Pain	23 (78%)	20 (66%)	0.39

Table-3: Hospital Stay

Hospital Stay	Local Anaesthesia	General Anaesthesia
1-2 days	23 (77%)	
3-4 days	7 (23%)	3 (10%)
5-6 days	-	12 (40%)
7-8 days	-	15 (50%)
Total	30	30

DISCUSSION

The choice of general (GA) *versus* local anaesthesia (LA) in open inguinal hernia repair has a substantial financial impact and may influence clinical outcomes. The results of this study demonstrate that the use of local anaesthesia for hernia repair is associated with better results of surgery as well as reduced early and late complications and lesser long term recurrence of hernia.

In our study, hospital stay was reduced to maximum 2 days when patients were operated upon using local anaesthesia in 77% of study population. On the other hand, the minimal hospital stay was 3-4 days observed in 10% of patients operated under GA. This can be translated into a cost-effectiveness of LA for inguinal hernia repair which has been reported in a study by Nordin and colleagues.¹⁴ Repair of hernia under local anaesthetic leads to improved patient satisfaction rates when compared with repair under general anaesthesia in addition to an increased rate of day-cases.¹⁰ However, it is not possible to replicate these results in general hospital settings, outside specialist care setting.¹⁵ The use of local anaesthesia for hernia repair in the specialist centres is one of the reasons for

almost 100 per cent day case rates reported. The pain due to the infiltration of anaesthetic is perceived as the most common problem associated with the repair of inguinal hernia under local anaesthetic. The individual thresholds of pain vary and it may be severe enough for some to result in dissatisfaction with the procedure and future avoidance of the procedure.¹⁶ Apart from retention of urine which was significantly higher in the general anaesthesia group ($p < 0.05$), no statistically significant difference was found in occurrence of complications in the two groups. There are conflicting reports in literature when the post-herniorrhaphy urinary retention is compared between local and general anaesthesia groups.^{17,18} Some studies found no difference between the two groups¹⁹, while others have reported that the incidence of retention of urine following herniorrhaphy under local anaesthesia is lower than that urinary retention following herniorrhaphy under regional or general anaesthesia.¹⁸

We did not find statistically significant differences between the two groups with respect to the occurrence of long-term pain in groin following surgery despite the fact that the complaint of groin pain was more frequent in the group receiving general anaesthesia. It is of note to mention that a literature search returned with no reports comparing the occurrence of groin pain in the two anaesthesia methods. On the other hand, there are reports of a low occurrence of long term pain in groin following herniorrhaphy under local anaesthesia.^{2,3} Although the recurrence rates for inguinal hernias for the long term have been reported to be very low by the specialists hernia centres across the world, e.g., the UK hernia recurrence rates have been reported to be in the range of 5–15%¹⁹, we did not study the recurrence rates in our study population and / or compare the recurrence rates for the hernia repairs under local anaesthesia and general anaesthesia.

CONCLUSIONS

It can safely be concluded that the use of local anaesthesia for herniorrhaphy in patients with inguinal hernias is more efficacious than the general anaesthesia.

AUTHORS' CONTRIBUTION

All the authors contributed equally.

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