

Comparison of the outcome of mesh hernioplasty under local anaesthesia in patients with age less than 60 years VS more than 60 years in terms of wound complications and urinary retention

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Abstract

Objective: To compare the outcome of mesh hernioplasty performed under local anaesthesia in relatively young and older patients regarding wound complications and urinary retention.

Methods: This comparative study was conducted at Mayo Hospital, Lahore, Pakistan, from 17th Feb 2017 to 17th Feb 2018, and comprised patients who underwent mesh hernioplasty. Demographic profile was noted and the patients were divided into <60 and >60 age groups. Surgical method used was Lichtenstein mesh repair under local anaesthesia. Outcome was documented in terms of urinary retention at 8 hours post-operation, wound seroma and haematoma at 24 hours and wound infection after 5 days of surgery. Data was analysed using SPSS 20.

Results: Of the 102 patients, there were 51 (50%) in each of the two age groups. Among patients <60 years, urinary retention developed in 4 (7.8%) compared to 6 (11.8%) in the other group. Frequency of the wound complications, including wound haematoma, seroma and wound infection, were seen in 3 (5.9%), 2 (3.92%) and none respectively in the younger group compared to 2 (3.92%), 2 (3.92%) and none respectively in patients aged >60 years.

Conclusion: The results in patients aged <60 years and >60 years were comparable in terms of urinary retention and wound complications.

Keywords: Inguinal hernia, Urinary retention, Wound seroma, Wound hematoma, Wound infection.

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Introduction

Inguinal hernia is a very common disease and it is more commonly occurring in elderly patients than in younger patients.¹ The incidence rises from 11/10,000 persons aged 16-24 years to 200/10,000 persons aged 75 years and above.² Moreover, the demand for operations for inguinal hernia is increasing due to an increase of an aging population. The safest approach for repair of inguinal hernia in old patients is mesh hernioplasty under local anaesthesia.^{3,4}

Many surgeons reserve this local hernia repair only for the elderly patients because of high risk for general or spinal anaesthesia, and studies have shown superiority of local anaesthesia in elderly patients than young patients.⁵ The application of local anaesthesia needs a sound knowledge of anatomy of nerves in inguinal area, minimal manipulation of structures and less post-operation complications.

Very few studies are available from Pakistan favouring

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inguinal hernia repair under local anaesthesia.⁶ The current study was planned to compare the frequency of complications in two age groups have inguinal hernia for which mesh hernioplasty was used under local anaesthesia.

Patients and Methods

The comparative study was conducted at the Department of Surgery, Mayo Hospital, Lahore, Pakistan, from 17th February 2017 to 17th February 2018. After approval from the institutional ethics review committee, the sample size was calculated at 90 % confidence level, 5% absolute precision with 6.6% expected wound infection 3.3% urinary retention.⁷ The formula used was $n = Z^2 \frac{1-\alpha/2}{d^2} \{P_1(1-P_1) + P_2(1-P_2)\}$.

Where $Z^2 \frac{1-\alpha/2}{d^2} =$ confidence level 90% = 1.645; $P_1 =$ population proportion 1 = 6.6%; $P_2 =$ population proportion 2 = 3.3%; and $d =$ absolute precision = 5.

The sample was raised using non-convenience probability sampling from among those admitted through the outpatient department (OPD) who were males aged >18 years with complete and reducible inguinal hernia. The subjects were divided into two equal groups based on age; <60 years Group A, and >60 years Group B. Those with recurrent irreducible and strangulated hernia, skin infections and post-micturition volume, determined by ultrasonography of the urinary bladder, >30ml were

excluded. After obtaining informed consent from the participants, third-generation cephalosporin injection ceftriaxone 1gm intravenous (IV) was given half-an-hour before the surgery. All operations were performed by resident surgeon using Lichtenstein mesh hernioplasty technique^{8,9} with standard weight polypropylene mesh. Local anaesthesia was employed using step by step procedure as defined in literature, and it was monitored by pulse oximeter.¹⁰⁻¹¹

Outcome was measured in terms of post-operative urinary retention and wound complications. Urinary retention was described as the incapacity to totally or partially empty the bladder 8 hours after the completion of surgery.

Wound complication was measured in terms of wound haematoma, defined as collection of blood in the wound evident on examination, or wound seroma at 24 hours, and wound infection, which was defined as pain and localised swelling of the wound with purulent discharge from which the organism was isolated on culture after 5 days of the surgery.

Data was collected on a predesigned proforma and was analysed using SPSS 20. Study variables were urinary retention and wound complications measured in terms of wound haematoma, seroma and infection. Comparison between the groups was done to see any statistical difference. Quantitative variables were presented as mean \pm standard deviation (SD), and qualitative variables were presented as frequencies and percentages. Comparison between the groups was done using chi-square test and level of significance was considered at $p \leq 0.05$. In line with our hypothesis that despite difference in age, the outcome would be similar, the difference between the groups had to be non-significant for our for the hypothesis to be true.

Results

Of the 102 patients, there were 51 (50%) in each of the two age groups. In Group A, urinary retention developed in 4 (7.8%) patients compared to 6 (11.8%) in Group B ($p > 0.05$). Frequency of the wound complications, including wound haematoma, seroma and wound infection, were seen in

Table: Complication rates among different age groups.

Parameters	Group A (≤ 60 years) (n=51) n (%)	Group B (> 60 years) (n=51) n (%)	p-value* (for chi square test)
Urinary Retention	4 (7.8)	6 (11.8)	0.09
Wound Complications	5 (9.8)	4 (7.8)	0.19
Haematoma	3 (5.9)	2 (3.9)	0.43
Seroma	2 (3.9)	2 (3.9)	0.95
Infection	0 (0)	0 (0)	Ns

*p-value for chi square test (none of the parameters were significant in the groups which indicates the outcomes like urinary retention and wound complications are comparable among groups and these outcomes does not depends of age of patients).

3 (5.9%), 2 (3.92%) and none respectively in Group A compared to 2 (3.92%), 2 (3.92%) and none respectively in Group B ($p > 0.05$) (Table). Overall, no patient had anaesthesia-related side effects or complications.

Discussion

Elective inguinal hernia repair is one of the most common surgical procedures. The choice of anaesthetic technique for inguinal herniorrhaphy is based on the preference of the surgeon, anaesthesiologist and the patient; complexity and duration of the procedure; ease of execution; length of recovery; and cost-benefit. Field block and/or ilioinguinal nerve and iliohypogastric nerve block have better cost-benefit in terms of speed of recovery, satisfaction and costs than general anaesthesia and spinal anaesthesia in herniorrhaphy.¹²

Lichtenstein's repair is the most commonly used procedure mainly owing to ease of operation and because it provides a tension-free reinforcement of the posterior abdominal wall of inguinal canal. The fundamental defect in inguinal hernias is in the posterior abdominal wall e.g. deficiency in transversals fascia. All repairs include strengthening of this layer. However, the final outcome of inguinal hernia repair depends on the type of repair, experiences and skills of the surgeons and type of anaesthesia used.¹³ There was always debate about the gold standard technique for inguinal hernia repair in addition to laparoscopic repair, and comparison was always between Lichtenstein and non-mesh repair, but surgical site infection, foreign body sensation and migration of mesh were serious problems.¹³

Tension-free technique with mesh-plug is a widely accepted technique with optimal results and minimal recurrence. In a multicentre randomised trial with 5-year follow-up the recurrence rate after Lichtenstein repair was 1.2%.¹⁴

Inguinal hernia repair can be performed under any form of anaesthesia known in medicine. Patients with symptomatic hernias should be offered elective surgical repairs under local anaesthetic infiltration, although general, local or epidural anaesthesia can all be safely used. Current evidence supports the use of local infiltration anaesthesia as it has shorter intra-hospital recovery and less urinary morbidity. These shorter operating, convalescing and ambulating times as well as early discharge make local anaesthesia ideal for day-case surgery and also this is the reason that more elderly and moribund patients can safely undergo repairs. It has also been shown to have considerable cost advantages over regional and general anaesthesia.¹⁵

In a study in 2007, the day-case rates were significantly

higher under local anaesthesia (82.6%) compared to general anaesthesia (42.6%).¹⁶ A recent systematic review argued that the use of local anaesthesia avoids the complications of general and spinal anaesthesia, and enables more patients to go home on the day of operation. Local anaesthetic repairs are quicker, have fewer adverse effects on respiratory functions and cardiovascular system than both general and regional anaesthesia and it can also be safely used in patients with co-morbid conditions. However, local anaesthetic repair is technically more demanding.¹⁶

Another advantage of avoiding general anaesthesia is having a conscious patient during the operation who can cough, when needed, to increase intra-abdominal pressure during exploration or checking the safety of the repair. Local anaesthesia is also considered an assurance for more delicate surgical manipulation. Surgeons will have to dissect the tissues gently and the assistants will have to retract the wound edges with caution.¹⁷ A step-by-step infiltration technique is the widely used method for establishing local anaesthesia, and the dose of anaesthetic agents can be always kept in the limit of confidence. IV mild sedation should also be added to maximise intra-operative comfort.¹⁸ In respect of post-operative anaesthesia-related complications, local anaesthesia seems to be more advantageous than its counterparts. Urinary retention rate is much lower in local anaesthesia. It is also free of severe headache which is seen after spinal anaesthesia.¹⁹

Inguinal hernia repairs are clean surgical procedures where antibiotic prophylaxis is not recommended for routine use. Most recent Cochrane meta-analysis on antibiotic prophylaxis in inguinal hernia repair in which 7 of 13 trials were mesh repair series concluded that "administration of antibiotic prophylaxis for elective inguinal hernia repair cannot be universally recommended."²⁰

Different mesh techniques have been described to date. Single- and double-layer meshes, and plug repairs all have been reported with good results by their users and defenders. However, the Environment, Health and Safety (EHS) guideline has clearly stated that none of the alternative mesh techniques except for the Lichtenstein and endoscopic techniques has received sufficient scientific evaluation to be recommended.²¹ Reasonable recurrence and complication rates have been obtained worldwide. The Lichtenstein Hernia Institute and the British Hernia Centre reported very low recurrence rates in thousands of cases. It is also suitable for outpatient surgery in an economic way by using local anaesthesia.²² Today, some strong recommendations exist in favour of Lichtenstein repair. The American College of Surgeons chooses this technique for "gold standard", while the

National Institute of Clinical Excellence (NICE) of the United Kingdom and the National Agency for Accreditation and Evaluation in Health (ANAES) of France recommended it for inguinal hernia repair. It is easy to learn and perform.²³ The increasing use of day-case surgery is in line with guidelines of the Royal College of Surgeons of England, which states that at least 30% of all hernia repairs should be performed as day-case. The UK-wide day-case rate was for inguinal hernia repairs in 2003 were around 20%.²⁴

On the contrary, side-effects of local anaesthesia attributed to vagal stimulation, such as hypotension or bradycardia, have been occasionally reported. Some authors state that regional anaesthesia techniques (spinal-epidural) have no documented benefits, and, as invasive techniques, they carry a low risk of rare neurological side-effects and high risk of urinary retention.²⁵ In the UK, only 5-10% of inguinal hernia undergo surgery under local anaesthesia with majority of cases being repaired under general anaesthesia (60-70%) and regional anaesthesia (10-20%).²⁶

The work of Lichtenstein, developed in his clinic in California, shows 2,000 patients operated on by his technique without hospitalisation and with local anaesthesia with absence of severe complications or deaths, and a recurrence rate <1%.²⁷

Another study showed a good success rate of inguinal hernia repair under local anaesthesia in elderly patients presenting a wound complication rate of 3.6% in patients <60 years compared to 6.6% in patients >60 years.²⁸

One study showed extraordinary morbidity of surgery of inguinal hernia in local anaesthesia in elderly patients compared to younger population. Wound complications affected 3.8% cases <60 years compared to 10.9% of cases >60 years ($p < 0.001$).²⁹

The current study did not encounter any major intra-operative or post-operative complication.

Apart from a small sample size, the main limitation of the current study was in terms of perception of pain. It was difficult to convince patients to have the surgery under local anaesthesia as many patients were afraid of being operated when they are awake. As such, post-operative pain is difficult to be assessed accurately, because of the variation of perception of pain between individuals. The visual analogue scale (VAS) method employed in the present study can be considered an indicative tool.

Conclusion

Elective inguinal hernia repair under local anaesthesia was found to have a good outcome in both the relatively younger and elderly individuals. The procedure was found

to be feasible and safe and caused no post-operative significant pain. It allowed shorter duration of hospitalisation and faster access to treatment.

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