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Prospective Study of inguinal hernia under local anaesthesia: A study from rural set-up

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Abstract
Background: In developing countries like India inguinal hernia surgery is mostly done under spinal or general anesthesia. Repair of inguinal hernia is one of the most common operations in general surgery. A reducible hernia is usually a longstanding condition, and diagnosis is made clinically, on the basis of typical symptoms and signs.
Aims and Objectives: To assess the usability of local anesthesia for groin hernia repair and to understand the effects of inhibition of local nociceptive molecules on postoperative recovery after inguinal hernia repair.
Materials and Methods: It was an observational study conducted on a sample of 50 patients who were operated for groin with Lichtenstein technique under local anesthesia at Department of Surgery at BRD Medical College, Gorakhpur (UP). All these general surgeries were carried out during Jan 2015 to Dec 2016. Data for this study was collected ranges from first 48 hrs after the surgery, 7 days after the surgery and 6 months after the surgery.
Results: Data collected during this study show that there was very less anesthesia complications after the operation, recovery and postoperative ambulation of the patient was early and overall reduction of cost of surgery was 10%.
Conclusions: Based on the promising outcomes of local anesthesia during this study we conclude that local anesthesia for the groin hernia repair can be a good choice for patients in Indian population.

Keywords: local anaesthesia, inguinal hernia, lichtenstein technique, post operative complications

Introduction

For inguinal hernia surgery various anesthesia techniques can be applied, such as general anesthesia, regional anesthesia, spinal anesthesia and epidural technique [1, 2].

The main criteria for the selection of anesthesia technique are patient safety and the provision of optimal operating conditions for the surgeon. General and spinal anesthesia are known to cause the hemodynamic changes during introduction and maintenance [3, 4].

For inguinal hernia repair, local anesthesia has shown better results, less complications and early recovery [5, 6].

Hence present study was performed to assess the usability of local anesthesia for groin hernia repair and to understand the effects of inhibition of local nociceptive molecules on postoperative recovery after inguinal hernia repair.

Materials and Methods

In this is study we analysed the 50 inguinal hernioplasty carried out by shouldice technique by administering the local anesthesia. Patients having unilateral reducible groin hernias who were fit for anesthesia were the subjects of this study. Relevant data was collected from indoor case paper review till the postoperative follow up of 6 months.

Subject were counselled to stop smoking before the surgery. Proper technique of administration and genital tissue manipulation are the critical factors of success for local anaesthesia.

During the study we administered Ceftriaxone 1000mg + Sulbactam 500mg just before starting the procedure and two doses at interval of 12 hours and one ample of pentazocin+ half ample of phenothiazin deep IM along with local anaesthesia 50:50 mixtures of 2% xylocain and 0.5% bupivacaine i.e. 10ml of each solution diluted with 20ml of water for injection was used. Maximum therapeutic dose of lignocaine was 300mg in plain form and 500 mg was with epinephrine.

Bupivacaine dose of 175mg in plain and 225mg with epinephrine and maximum required 45ml of the mixture for repair of unilateral inguinal hernia. Mixture has benefits like lignocaine causes quick onset and bupivacaine results in a longer duration of local anesthesia (sedation). Effect duration of anesthesia can be extended by the additional use of 2% lignocaine with adrenaline. For caution adrenaline must be used carefully in hypertensive and cardiac illness.

Use of mixture of two anaesthesia agents reduces the risk of exceeding the therapeutic maximum dose of each anaesthesia agent. This technique of administration is mainly useful in simultaneous bilateral inguinal hernia surgery.

Steps used for injecting local anesthesia

Subdermic infiltration: Subdermic tissues along the line of incision of inguinal hernia are infiltrated with 5 to 7 ml of anaesthesia agent with the help of 25 gauge spinal needle.

Infiltration continues with advancement of needle. Moving needle inhibits the intravascular infiltration of local anesthetics agent. This step chokes the sub-dermic nerve openings and reduces the discomfort of the intradermic infiltration.

Intradermic injection: Needle inserted into the sub-dermic plane is slowly withdrawn until the tip touches the intradermic

level. At this level a 3 ml mixture is very slowly infiltrated along the line of incision to make skin wheal (Wheals reflect circumscribed dermal edema fluid collection in the layer of skin below the surface). Additional sodium bicarbonate solution infiltrated to increase the ph of anesthetic mixture which can reduces the pain of intradermic infiltration.

Subcutaneous injection of 10 ml mixture is injected deep into the subcutaneous adipose tissues vertically at 90 degree to the skin at 2 cm apart, while injection needle is kept moving to reduce the risk of intravascular infiltration.

In subfascial infiltration, 8 to 10 ml of anesthetic mixture in injected immediately beneath the external oblique aponeurosis through the window created in the subcutaneous adipose tissue at the lateral corner of the incision. This mixture filled into the enclosed inguinal canal and blocks nerves of inguinal canal.

Progressively rest of the subcutaneous tissues opened up to the external oblique. The subfascial injection separates the external oblique aponeurosis and reduces the chances of injuring underlying ileoinguinal nerve when the external oblique aponeurosis is incised.

Occasionally pubic tubercle and hernia sac are required to be infiltrated with 1 or 2 ml of anesthetic agent, before fixing the medial end of mesh, around the neck of indirect sac and inside the sac before dissecting it from the adjacent cord structure. Complete local anaesthesia can be achieved by these steps.

Further extended anesthesia can be achieved by splashing 10 ml of the mixture in the inguinal canal before closer of the external oblique aponeurosis and into the subcutaneous space before the skin closer.

During the study intraoperatively surgeries were monitored by anesthetist and the anxiety of the subjects was taken care by intravenous infusion of short acting amnesia and anxiolytic agents such as propofol. Sedatives use decreases the amount of local anesthetic agents.

Results

All the subjects for this study had reducible inguinal hernia and were male of age 18 to 75 years. Nyhus distribution of type of hernia is as follows- Nyhus 1 in 20 patients, Nyhus 2 in 8 patients, Nyhus 3 in 22 patients.

Intraoperative results: For all the subjects' surgery lasted for 30 to 45 minutes. I cohort 8 patients of age group 18 to 40 years and had shown anxiety due to that given additional intraoperative sedation with propofol, whereas2 patients of older age group 40 to 75 years who were sedated with propofol. None of the subject from the cohort had complained of intraoperative pain.

Postoperative 48 hrs: Complete cohort was given 2injections of analgesics like tramadol or diclofenac in the first 24 hrs. Subjects were ambulated after 24hrs of surgery. Subjects were comfortable with oral analgesics from day 2. No one from the cohort complained of headache or hypotension in preoperative period. Two subjects were required catheterization due to postoperative retention of urine because of anxiety and pain at local site due to delayed analgesic injection, rest of all subjects were ambulated and passed urine without the catheterization.

Postoperative 7 days: From the cohort 4subjects have developed scrotal edema which get normalized after 2 weeks. In 2subjects superficial wound got infected which got healed with antibiotics. None of the subject had complained of pain at the time of suture removal.

4 subjects were given mild oral analgesics on day 7 due to the local pain.

6 Months follow-up: From the cohort none of the subject has reported complication or recurrence and only4subjects were prescribed for intermittent oral analgesics for mild local pain.

Discussion and Conclusion

From the observations and outcomes reported by our study we conclude that the inguinal hernioplasty under local anesthesia is safe for the patients, it has better postoperative pain control and lesser or no anesthesia related complications like spinal headache, perioperative hypotension, and postoperative nausea and vomiting. We also observed reduced postoperative retention of urine, shorter recovery time and overall reduction in the cost of surgery.

In the follow-up period of 6 months there was no patient reported with recurrence and only 8% patients had reported mild pain. Long term results with larger sample size will be more helpful to understand the long term results of the surgery.

Studies have confirmed that peripheral tissue injury may result in long lasting changes in central processing with reduction of threshold, amplification of responses, expanded receptive field and after discharges of dorsal horn nerves. Successively it has been recommended that surgical trauma may lead to comparable alterations, resulting in amplifications and prolongation of postoperative pain [6].

Results of current study had shown improved postoperative pain control with local anesthesia and early return to normal activities [7].

Preoperative local anesthesia in combination with general or spinal anesthesia has been shown to reduce postoperative pain and wound tenderness compared to general or spinal anesthesia only [8].

Tenderness of the wound was the main reason understood for the chronic groin pain in 6 months of the surgery [9].

In present study, in repair part double breasting of faciatransversails with 2-0 prolein and approximation of conjoint tendon to inguinal ligament by prolein no 1 on 30mm needle in two layers and total four layers. We found that timing and results of shouldice technique is similar to other techniques and it also reduces the cost of surgery. Shouldice technique is also free from inguinodenea which is more in mesh repair.

The cross sectional nature was the main limitation of present study, because of that present study finding cannot be applied to larger population. A large randomized clinical trial is needed to strengthen the present study findings.

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