**Observational study of inguinal hernia under local anaesthesia in rural set-up**

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**Abstract:**
Aims and objectives: Inguinal hernia is done mostly under spinal or general anaesthesia in the developing country like India. Objective of this study is the feasibility of local anaesthesia for groin hernia repair and effect of inhibition of local nociceptive molecules on postoperative recovery after inguinal hernia repair.

Background data: In the last 10 years we had done 1500 inguinal hernia surgery at our institute under spinal or general anesthesia and some high risk cases under inguinal block.

During last 2 years we had started doing inguinal hernia under local anaesthesia and sedation.

Method: We had conducted an observational study of 25 groin hernias operated in our institute with Lichtenstein technique under local anaesthesia and sedation. All the surgeries were done during Feb. 2013 to Jan 2015. Data was collected during intraoperative period, first 48 after the surgery, 7 days after the surgery and 6 months after the surgery.

Result: There were significant less immediate postoperative anesthesia complications; postoperative ambulation of the patient was early. There was 10% reduction of overall cost of surgery.

Conclusion: Local anaesthesia for groin hernia repair may become an anesthesia of choice in developing country like India.

Key words: Local anaesthesia, inguinal hernia

**Introduction:**
Groin hernia is the oldest known affection of human kind. Inguinal hernia surgery can be performed under variety of anesthesia techniques such as general anesthesia, regional anesthesia, spinal anesthesia and epidural technique. Patient safety and the provision of optimal operating conditions for the surgeon are the main criteria for the selection of anesthesia technique. General and spinal anesthesia have reported to cause hemodynamic changes during induction and maintenance. Local anesthesia is supposed to be best anesthesia for inguinal hernia repair. At Shouldice clinic in Toronto and Lichtenstein hernia institute California all inguinal hernias are done under local anesthesia. At our postgraduate teaching institute this is an initial experience of groin hernia repair under local anesthesia.

**Material and methods:**
This is an observational study of 25 inguinal hernioplasty done by Lichtenstein technique under local anesthesia and sedation. All patients with unilateral reducible groin hernias fit for anesthesia were included in the study. The surgeries were done between Feb. 2013 to Jan 2015. Data was collected
after indoor case paper review and postoperative follow up of 6 months.

Patients were advised to stop smoking prior to surgery. The success of local anesthesia requires a proper technique of administration and gentle tissue manipulation. We had used 50:50 mixtures of 2% xylocain and 0.5% bupivacaine. We had used 10ml of each solution diluted with 20ml of water for injection. Therapeutic maximum dose of lignocaine is 300mg. in plain form and 500 mg with epinephrine.

For bupivacaine, the dose is 175mg plain and 225mg. with epinephrine. We required maximum 45ml of the mixture for repair of unilateral inguinal hernia.

This mixture has some benefits. Lignocaine provides rapid onset and bupivacaine results in a longer duration of local anesthesia. Anesthesia duration time can be prolonged further by the use of 2% lignocaine with adrenaline. Adrenaline should be used cautiously in hypertensive and cardiac illness.

Use of two different anesthesia agents decreases the likelihood of exceeding the therapeutic maximum dose of each individual agent. This is particularly useful in case of simultaneous bilateral inguinal hernia operation.(1)

The following steps were used for infiltration of local anesthesia.(2)

Subdermic infiltration: 25 gauge spinal needles was used for 5 to 7 ml Subdermic tissue infiltration along the line of incision of inguinal hernia .Infiltration continues as the needle is advances. Movement of the needle prevents intravascular infiltration of local anesthetics. This step blocks the subdermic nerve endings and decreases the discomfort of the intradermic infiltration.

Intradermic injection : ( making the skin wheal) the previously inserted needle into the Subdermic plane is slowly withdrawn until the tip reaches the intradermic level.3 ml mixture is very slowly infiltrated along the line of incision to make skin wheal. Addition of sodium bicarbonate solution to increase the ph of anesthetic mixture may decrease the pain of intradermic infiltration.(3,4)

Deep subcutaneous injection of 10 ml mixture is injected deep into the subcutaneous adipose tissue by vertical insertion of needle (perpendicular to skin surface) 2cm apart, againe the needle is kept moving to decrease the risk of intravascular infiltration.

Subfascial infiltration of approximately 8 to 10 ml of anesthetic mixture in injected immediately underneath the external oblique aponeurosis through the window created in the subcutaneous adipose tissue at the lateral corner of the incision. This injection floods the enclosed inguinal canal and blocks all the three nerves of inguinal canal.

Gradually rest of the subcutaneous tissue is opened up to external oblique. Subfascial injection separates the external oblique aponeurosis from the likelihood of injuring underlying ileoinguinal nerve when the external oblique aponeurosis is incised.

Pubic tubercle and hernia sac occasionally needs to be infiltrated with few ml of anesthetic infiltration. Pubic tubercle 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.

These steps can achieve complete local anesthesia. Additional prolonged 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 apace before the skin closer.(5)

Intraoperatively surgery was monitored by anesthetist. Anxiety of the patient was taken care of by intravenous infusion of short acting amnesia and anxiolytic agents such as propofol. Sedatives use decreases the amount of local anesthetic agents.
Results:
All 25 patients had reducible inguinal hernia. All patients operated were male, in the range of 18 to 75 years age. Nyhus distribution of type of hernia is as follows- Nyhus 1 in 10 patients, Nyhus 2 in 4 patients, Nyhus 3 in 11 patients.

Intraoperative results: Duration of surgery was 30 to 45 minutes in all cases. 4 patients in younger age of 18 to 40 year had anxiety requiring intraoperative sedation with propofol, where as 1 patient in older age between 40 to 75 year required sedation with propofol. No patient complained of intraoperative pain.

Postoperative 48 hrs: All patients required 2 injections of analgesics like tramadol or diclofenac in the first 24 hrs. All patients were ambulated after 24 hrs. All patients were comfortable on oral analgesics from day 2. Not a single patient complained of headache or hypotension in preoperative period. Only one patient required catheterization for postoperative retention of urine due to anxiety and pain at local site due to delayed analgesic injection. Otherwise all other patient were ambulated and passed urine without catheterization.

Postoperative 7 days: 2 patients had scrotal edema which resolved over 2 weeks. 1 patient had superficial wound infection which was taken care of by antibiotics. No patients had local pain at the time of suture removal.

2 patients were prescribed mild oral analgesics on day 7 for mild local pain.

6 Months follow-up: There was no case of recurrence and 2 patients required intermittent oral analgesics for mild local pain.

Conclusion: inguinal hernioplasty under local anesthesia provided with increased safety for the patient. Better postoperative pain control, no anesthesia related complications like spinal headache, perioperative hypotension, postoperative nausea and vomiting and reduced postoperative retention of urine. Patients had short recovery time. There is overall reduction of the cost of surgery. Though at 6 months there were no patients with recurrence and only 8% patients had mild chronic pain, long term results with larger sample size will be required for comparing long term results of the surgery.

Experimental studies have demonstrated that peripheral tissue injury may result long lasting changes in central processing with reduction of threshold, amplification of responses, expanded receptive field and after discharges of dorsal horn nerves. Subsequently it has been suggested that surgical trauma in humans may lead to comparable alterations, resulting in amplifications and prolongation of postoperative pain. \(^{(6,7,8)}\)

Our results had shown better postoperative pain control with local anesthesia and early return to normal activity.

Preoperative local anesthesia in conjunction with general or spinal anesthesia has been shown to reduce postoperative pain and wound tenderness compared with general or spinal anesthesia only \(^{(9,10)}\).

This may be the reason of less chronic groin pain after 6 months follow-up in our studies.
References:


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