

Inguinal hernia repair under local anaesthesia

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ABSTRACT

Background: For various reasons, inguinal hernia repair under local anaesthesia is not well accepted to both patients and surgeons. The patients fear from pain and surgeons need full relaxation and co-operation to do successful hernia repair

Methods: purpose of this study is to evaluate the effectiveness of local anaesthesia in inguinal hernia repair.

prospective study was made from January 2011-October 2013 , on a total of 50 patients with inguinal hernia operated on under local anaesthesia. Patients were selected primarily on the basis of their willingness to accept the procedure after the technique was described to them.

Results: In this study 50 patient and 58 herniorrhaphies done for them during a period of about 34months were evaluated .A questionnaire was sent to each patient postoperatively to aid in evaluating the subjective reaction

to the local anaesthesia. all patients were males ,age range between 31-83 year, median age 51 .types of inguinal hernia were sliding 1case ,pantaloon 5cases ,indirect 28 cases ,direct 24 cases ,Rt. Side 27cases, Lt. side 15 cases ,bilateral hernia 8 cases .we give local anesthesia by 2 methods

Conclusions: Local anesthesia is without question the safest available technique of anesthesia.

Local anesthesia is an extension of the surgical procedure (indeed, often an integral part of that procedure), and as such its administration should be the concern of the surgeon.

Key words: Inguinal hernia repair, Local anesthesia, Xylocaine , Diazepam, Pethidine

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Hernia: Latin word, mean, "rupture or tear", Ancient Greek were the first who referred to inguinal hernia in 1500 BC. "1"Reducibility and absence of transillumination were used by early Greek physician to distinguish hernia from hydrocele. "2"*Guyde chauliac*(1363)distinguished inguinal from femoral hernia,*Heister*(1724)distinguished direct form indirect inguinal hernia."3"

History of inguinal hernia repair:

Traditional hernia repair, had got little modification 100 year ago from 1st description by *Bassini* "1884" who used interrupted silk suture in approximation of conjoint tendon to inguinal ligament including transversalis fascia, recurrence rate was under 10% in 5yrs follow up"1". *Macvay* "1940" popularized the use of cooper's ligament instead of inguinal ligament while among notable improvement in tissue repair is multilayer repair were described by *Shouldice* 1953 who later reported a recurrence rate<1%"1". Some other surgeons though for re-enforcement of the posterior wall of the inguinal canal using either biological or synthetic material "Darning", such methods become popular due to the simplicity with recurrence rate <1%"4"

Lichtenstein: American surgeon introduced the concept of tension free hernioplasty in repair of primary groin hernia, he thought that tension is an important factor in recurrence, such tension result from suturing of conjoint tendon to inguinal ligament which are normally unopposed"5,6"

another new method of hernioplasty using prosthetic mesh has gained worldwide acceptance, being preferred method in British hernia center that in 1996 they used such method in the repair of >50% of primary inguinal hernia"7"

Lichtenstein modern herniologist performed operations under local anaesthesia using synthetic prolene mesh either superficial or deep to transversalis fascia and either in the form of simple on lay graft to posterior wall of inguinal canal or plugged or rolled form for patulous internal ring"8,9,10."

A truss may be used when the operation is contraindicated or when operation is refused by the patient, nevertheless its use should mainly historical as there are very few contraindication to surgery with today's variety of anaesthetic techniques especially local anaesthesia."11"

Difficulties which prevent making use of local anaesthesia as a routine in many types of surgery arise from patients acceptance and experience of surgeons with methods of administering and maintaining local anaesthesia. *Glover* had stressed the need for including experience with local anaesthetic methods during surgical training"12"*Cushing* 1900describes 49 cases of inguinal herniorrhaphy performed under local anaesthesia, the anatomy of the nerve supply of the inguinal region was clarified during this series and presented, illustrated with his own drawing and he was impressed with many advantages of local anaesthesia"13"

Several anesthetic agents may be used including lignocaine, bupivacaine, procaine and prilocaine. Lignocaine acts more quickly than bupivacaine but wears off more rapidly. Careful attention should be paid to the maximum doses of the local anesthetic agent that can be used to avoid serious side effects and drug toxicity, plain lignocaine 0.5% or 11% lignocaine with adrenaline 1:200,000. are satisfactory and the maximum amounts that may be used are as follows; the maximum dose of lignocaine is 3-4mg/kg body weight when used plain lignocaine and the dose can be doubled with the addition of adrenaline 1:200,000 which also improve quality and duration of local anaesthesia, so maximum dose for 70kg adult when plain lignocaine used are 250mg "50mL of 0.5% solution" and when mixed with adrenaline 1:200,000 500mg "100mL of 0.5%."duration of action of lignocaine is about 1-1 1/2 hr and when mixed withadrenaline 1:200,000 is about 2-2 1/2hr.toxic effects of ligocainc are twitching, restlessness,vertigo,convulsion,hypotension,bradycardia ,pallor, sweating

Method:A prospective study was made from January 2010-October 2012 in AL-Sader Teaching Hospital, on a total of 50 patients with inguinal hernia operated on under local anaesthesia. Patients were selected primarily on the basis of their willingness to accept the procedure after the technique was described to them, the only patients deliberately excluded were children and those who were either unable or unwilling to cooperate, also patients with recurrent inguinal hernia were excluded. Those 50 patients underwent 58 inguinal herniorrhaphies under localanaesthesia.All patients investigated as for routine surgical operation and a special forma had to be filled for each patient including medical history and preoperative, operative and postoperative details with follow up for each patientsThe charts of the patients have been reviewed. All patients were men. Their ages ranged from 31-83 years with age distribution as outlined in figure No.1.Of 50 patients with inguinal hernia ,27 hernia were on the right side 54% and 15 hernia were on the left side 30%and 8 patients had bilateral inguinal hernia 16%.The repairs were not standerized.Each herniorrhaphy was carried out by the method which seemed most appropriate at the time of surgery.

All patients admitted at the morning of the operation and premedication used were not standardized and closed as seemed appropriate for each patient and as follows:

1. In 15 patients no premedication were used 30%
2. In 25 patients given diazepam 10mg I.V.40%
3. In 10 patients given pethidine 100mg I.V • 20%.

An anesthesiologist or nurse anaesthetist was in attendance for each case. The usual anaesthetic chart was kept and pulse, blood pressure and respiration were recorded in most instances.The same anaesthetic solution was used for every patient regardless of age or risk and it consist of 60ml of 0.5% xylocaine with or without adrenaline 1:200,000 which equal to 300mg of xylocaine,

The amount of solution used range from 30-50mL according to adequacy of anaesthesia obtained and no patient require

more than 50mL and sometimes in thin patient we use less than 30mL "about 25mL."(Note:the patient should be weighed preoperatively and the maximum permissible volume of local anaesthesia calculated)

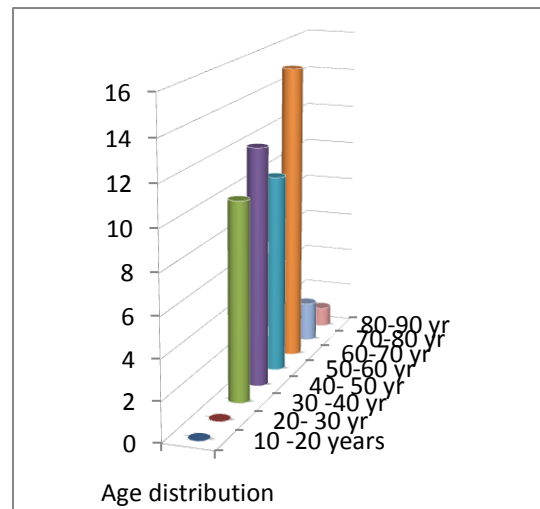


Fig. 1: The age distribution for fifty patients undergoing herniorrhaphies with local anaesthesia

No supplemental inhalation or intravenous anaesthesia was used, as cooperation is helpful in gaining adequate anaesthesia, patients thus treated tend to become disoriented and lose their ability to cooperate, when this occur a change to full general anaesthesia may be required. An intravenous opiate in small doses may be useful, however, if premedication has worn off or if the patient is severely apprehensive. This was thought to be indicated in only 10 cases during the present series of 58 herniorrhaphy .

There are 2 methods of administering local anaesthetic solutions and these are:

1-In this method of infiltration we inject local anaesthetic solution to all points before the skin incision, and this is done by using spinal needle No.22-No.25, about 3 inches long, a skin wheal is raised "1 inch" medial to the anterior superior spine of ilium, another wheal is raised just medial to the pubic tubercle. These two skin wheals are then connected with intradermal infiltration and from 5-10cc of solution used for this, the subcutaneous fat is then infiltrated with 5 to 20cc or more of the anaesthetic solution according to the obesity of the patient. Next the external oblique aponeurosis is pierced by inclining the syringe at 45° so that the needle enter via the lateral skin wheal and along the line of the proposed skin incision. As the needle is felt to pierce the fascia, 2or 3 cc of solution are injected sub-aponeurotically .

2.The second method of giving local anaesthesia is by step by step infiltration which begin with the site of skin incision and then proceed to infiltrate the subcutaneous tissue and then followed by the aponeurosis which opened and injection of ilioinguinal and iliohypogastric nerves under direct vision and then step by step until full infiltration completed as we proceed with the procedure.

Results.

In this study 50 patient and 58 herniorrhaphies done for them during a period of about 34months were evaluated. A questionnaire was sent to each patient postoperatively to aid in evaluating the subjective reaction to the local anaesthesia. The charts of all patients were reviewed and the distribution of variables were found to be as shown in table no. 1

| Variable | No. of patients | % from total |
|---|-----------------|--------------|
| 1-No. of patients | 50 | 100% |
| 2-Age range | 31-83 year | |
| 3-Mean age | 51 | |
| 4-Sex | 50 males | 100% males |
| 5-Type of Inguinal hernia | | |
| Sliding | 1 | 1.7% |
| Pantaloon | 5 | 8.6% |
| Indirect | 28 | 48.2% |
| Direct | 24 | 41.3% |
| Rt. side | 27 | 54% |
| Lt. side | 15 | 30% |
| Bilateral hernia | 8 | 16% |
| 6-Methods giving local anaesthesia: | 30 | 51.7% |
| First method | 28 | 48.3% |
| Second method | | |
| 7- use of premedication: | | |
| No premedication | 15 | 30% |
| Diazepam 10mg i.v | 20 | 40% |
| Pethedine 100mg i.v | 10 | 20% |
| 8-Antibiotic use | | |
| Antibiotic given | 30 | 66.6% |
| Antibiotic not given | 20 | 33.4% |
| 9-Type of local anaesthesia: | 18 | 31% |
| Xylocaine+ adrenaline 1:200,000 | 40 | 69% |
| Plain Xylocaine | | |
| 10-Risk factors presence (heart disease, smoking) | 30 | 60% |

Table 1: Show the distribution of variables

Intraoperative data revealed an average operating time of 55minutes with average 38mL of anaesthesia solution being used. Bradycardia and hypotension "pulse rate less than 50beats/minute", "blood pressure below 100mmHg" were developed in 4 patients "8%" of interest is the fact that these changes occurred early in each operation, while the subcutaneous tissues were being incised. Each patient responded promptly to intravenous atropine and the operation was completed smoothly without interruption. In only one patient "2%" was the anaesthetic changed from local anaesthesia to general anaesthesia, this occur because of poor case selection, the patient had irreducible indirect inguinal hernia that could not be reduced without additional relaxation. Patients were asked to classify the degree of pain felt during the operation as "no pain", "slight pain", "moderate pain" or "severe pain". 30patients experienced slight pain "60%" and the remaining 20 patients experienced no pain during the operation "40%." There were

no genitourinary or pulmonary complications. Bladder catheterization was not required in a single patient.

| Complications | No. of patients | % from total |
|-------------------------------------|-----------------|--------------|
| Intraoperative: | | |
| 1-Vasovagal reaction | 4 | 8% |
| 2-Conversion to general anaesthesia | 1 | 2% |
| 3-Degree of pain: | 20 | 40% |
| No pain | 30 | 60% |
| Moderate pain | | |
| Postoperative: | | |
| 1-Urinary tract infection | 0 | |
| 2-Bladder catheterization | 0 | |
| 3-Pulmonary complication | 0 | |
| 4-Wound infection | 2 | 3.4% |
| 5-Wound hematoma | 3 | 5.1% |
| 6-Scrotal swelling | 0 | |

Table 2: Show intraoperative and postoperative complications

The average length of hospital stay following surgery was 20 hour, 20 patients were discharged on the day of surgery "after a minimum of 6 hours bed rest and observation" "40%", 28 patients were discharged on the first postoperative day "56%" and only 2 patient were discharged in the second postoperative day "4%."

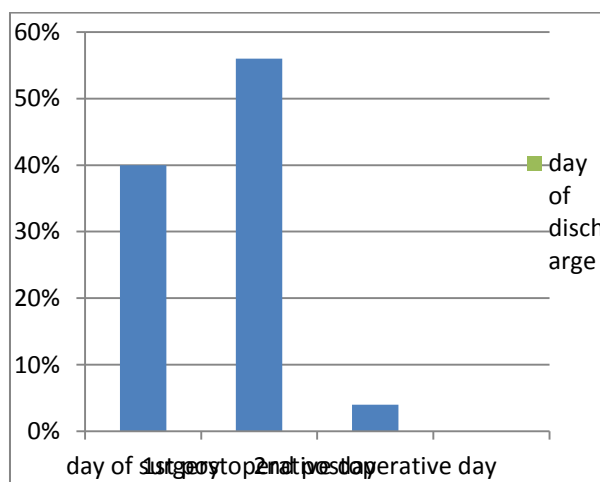


Figure to show length of hospital stay

Postoperative analgesia requirements were much less than expected, 3 patients require intramuscular injection of voltaren "diclofenac ampoule" "6%", 32 patient were comfortable taking only paracetamol tablets orally "64%" and we were surprised to find 15 patients did not require any form of analgesia following surgery "30%." Patient acceptance was excellent, with all but one patient definitely preferring local anaesthesia if they were to have another hernia operation, the only exception was a patient who had nausea and vomiting immediately postoperatively, though to be secondary to the premedication, in particular he stated that the surgical procedure did not disturb him and he did not have excessive pain postoperatively

Discussion. The surgeons in general make use of local anaesthesia only infrequently in surgery, local anaesthesia is usually reserved for the patients who are the poorest risks for surgery. Difficulties which arise because of lack of experience with methods of administering local anaesthesia discourage further usage. Glover "12" had stressed the need for including experience with local anaesthetic methods during surgical training. Inguinal hernia repair is ideally suited to local anaesthetic infiltration technique, the methods usually described are modification of that originally described by Braun "16" and later modified by Labat "17."

In our study we are impressed with many advantages of local anaesthesia encountered and these advantages are:

1. With a careful technique, local anaesthesia causes minimal physiological disturbance. This may be particularly useful for patients with cardiovascular or respiratory disease.

2. When adrenaline is mixed with the local anaesthetic useful vasoconstriction decrease systemic absorption

3. The absence of postoperative sedation or drowsiness allows early ambulation and diminishes the requirement for recovery facilities.

4. Local anaesthesia provide postoperative analgesia for up to four hours according to local anaesthetic agents used.

5. Advantages during the operation include the patients cooperation which is of assistance in assessing the size and situation of the sac and surrounding structures and the main sites of weakness can be identified when the patient is asked to cough or to do valsalva manouvre to increase intra abdominal pressure.

7. After completion of repair stress test is of great value to assess the efficacy of the repair when the conscious patient asked to cough or to do valsalva manouvre and this is important step to prevent approximation of tissues under tension and so prevention of recurrence.

There are 2 major disadvantages to the use of local anaesthesia in inguinal hernia repair:

1. The patients inevitably feel some pain but with adequate premedication and increasing experience of the surgeon this should become negligible.

2. The demand imposed upon the surgeon by the method, not only is the institution of anaesthesia the responsibility of the surgeons, but the constant maintenance of anaesthesia as well with the occasional interruption of surgical procedure.

-LEWIS and FELL "18" reported 2 cases of inadvertent block of femoral nerve during local infiltration anaesthesia for inguinal hernia repair, they suggested that this was due to the local anaesthetic solution tracking within the facial planes and that it could be avoided by the use of a more dilute solution and small volume as possible, although uncommon the possibility of this occurrence should be born in mind by all surgeons practicing local anaesthesia and it is of transitory nature lasting for about 2- 3hours, and we did not face such a complication in our patients in this study.

The use of adrenaline with the anaesthetic solution may predispose to postoperative wound haematoma and bleeding because of vasoconstriction produced by adrenaline gives false impression of adequate haemostasis and when its action end bleeding may resulted, in our study 18 operation done with the use of adrenaline "31%" in 2 of them postoperative wound hematoma develop "11%" and as compared to 40 operations were done by the use of plain xylocaine "68%" and among these only 1 case develop wound haematoma "2.5% "

Seven patients " 14%" had undergone previous herniorrhaphies under either general or spinal anaesthesia, and all 7 patients stated that they preferred local anaesthesia over their previous form of anaesthesia.

CONCLUSION

I would like to make three points:

1 -Local anaesthesia is without question the safest available technique of anaesthesia

2-Any surgical procedure can be carried out using local anaesthesia, a point which may be of importance in emergency, disaster, shock, old age, debilitation, or in the absence of trained anaesthetists.

3-Local anaesthesia is an extension of the surgical procedure (indeed, often an integral part of that procedure), and as such its administration should be the concern of the surgeon.

And in addition to that the inguinal hernia repair is the operation which is ideally suited to be undertaken under local anaesthesia

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