

Original research article

A Clinical Study: Field Block for Inguinal Hernia Repair**¹Dr. Lokesh Walvekar, ²Dr. Rishindra Babu, ^{3*}Dr. Bonasi Devender****^{1,2,3} Assistant Professor, Department of Anaesthesia, Government Medical College, Siddipet, Telangana State.****Corresponding Author: Dr. Bonasi Devender****E-mail: bonasidevender@gmail.com****Abstract**

Background: Inguinal hernia repair is one of the more common types of surgeries performed. With appropriate techniques, the block provides excellent intraoperative anaesthesia and postoperative analgesia for hernia repair, thereby simplifying anaesthetic surveillance and postoperative care.

Aim and Objectives: To study the effectiveness of field block anaesthesia for inguinal hernia repair in our tertiary care settings.

Material and Method: A clinical study was undertaken for anaesthetising 50 patients aged between 18-60 years of age posted for elective inguinal hernia repair, consenting and co-operative for inguinal field block. Study was conducted at our institute for the period of one year, after getting consent from patients, approved by institutional ethical committee and followed inclusion and exclusion criteria

Results : Study included 50 patients, with mean of age was 39.36 years with SD of 12.68. All patients were hemodynamically stable throughout procedure and surgery. 36 patients had an excellent type of analgesia and relaxation. 8 patients complained of discomfort during surgical handling of the hernial sac or hernia repair. 4 patients were not comfortable with the above measures and needed fentanyl depending upon their body weight. 2 patients had no analgesia **Conclusion:** Field block is an effective technique of anaesthesia for inguinal hernia repair and it provides good quality of analgesia and relaxation intraoperatively.

Keywords: Inguinal hernia, Field block, Nerve Block etc

Introduction

Hernia is the word derived from Greek words “Heron” an offshoot or bulge. Hernia defined by Sir Astley Cooper (1804) as “protrusion of any viscus or part of the viscus through an abnormal opening in the walls of its containing cavity”. [1]

An inguinal hernia occurs when tissue, such as part of the intestine, protrudes through a weak spot in the abdominal muscles. The resulting bulge can be painful, especially when you cough, bend over or lift a heavy object. However, many hernias do not cause pain. Inguinal hernia repair is a surgical procedure often performed on patients in the elderly age group who have more medical problems and a higher postoperative morbidity compared with younger patients

A wide variety of anaesthetic techniques have been used for inguinal hernia repair such as local anaesthesia, spinal/epidural anaesthesia and general anaesthesia.[2] With appropriate techniques, the block provides excellent intraoperative anaesthesia and postoperative analgesia for hernia repair, thereby simplifying anaesthetic surveillance and postoperative care. The preferred choice of anaesthesia for adult inguinal hernia repair, in this case study, is local anaesthesia. It is safe, simple, effective, and economical, without any major post-anaesthetic side effects. Furthermore, local anaesthesia administered before the incision

produces longer postoperative analgesia because local infiltration, theoretically, inhibits the build-up of local nociceptive molecules and therefore, provides better analgesia in the postoperative period. [3]

Field block anaesthesia technique for inguinal hernia repair utilizes local anaesthetic block in inguinal region in territory of Ilioinguinal and Iliohypogastric nerves. Despite of all benefits, field block technique is still underused and neglected. Also it is the most cost-effective anaesthetic technique for out-patients undergoing unilateral inguinal herniorrhaphy with respect to speed of recovery, patient comfort and associated surgical costs. [4] Thus, in the present study we have undertaken the study of field block anaesthesia for inguinal hernia repair in our tertiary care settings.

Materials and Method

A clinical study was undertaken for anaesthetising 50 patients aged between 18-60 years of age posted for elective inguinal hernia repair, consenting and co-operative for inguinal field block. Study was conducted at our institute for the period of one year, after getting consent from patients, approved by institutional ethical committee and followed inclusion and exclusion criteria given below.

Inclusion criteria:

- Normal adults between 18-60 years age
- ASA-PS I and ASA-PS II
- Elective inguinal hernia repair without any complications.

Exclusion criteria:

- Patients below 18 and above 60 years.
- Patients with ASA-PS III and ASA-PS IV.
- Emergency Inguinal Hernia
- Associated complications (eg- Obstruction and/or perforation, strangulation, bowel ischemia etc)
- Uncooperative or non-consenting patients
- Infection at the site of anaesthesia

Method

Pre-anaesthetic evaluation was done at least a day prior to the scheduled surgery. History of present complaints, duration of swelling and any co-existing disease, previous surgery etc. are noted. A thorough physical, systemic examination was done which included the size of the swelling, type of hernia, weight of the patient, vital signs, airway assessment etc.

Procedure of Field Block for Inguinal Hernia Repair:

Under strict aseptic precautions with patient in supine position, first the anterosuperior iliac spine is identified. A skin wheal is made just half an inch medial to the anterosuperior iliac spine in the spinoumbilical line. A 23 G spinal needle was fixed to a syringe containing 15 ml of 1% lidocaine with adrenaline. The needle is then directed perpendicular to the skin through the skin wheal already made. As the needle is advanced first "give" is felt when needle passes the external oblique muscle. The second "give" is felt when the needle passes the internal oblique muscle. The needle now lies just above transversalis fascia through which ilioinguinal nerve and iliohypogastric nerves traverse where 15 ml of 1% lidocaine is to be injected in a fan shaped manner.

A second wheal is made over the pubic tubercle with syringe containing 5 ml of 1% lidocaine with adrenaline directed perpendicularly through the wheal until pubic tubercle is contacted. The needle is then walked off the pubic tubercle in cephalad direction until a cartilaginous structure known as Coopers ligament is contacted. The solution in the syringe is then injected into and along this structure.

A third skin wheal, raised 0.5 cm above the midpoint of the inguinal ligament and 5 ml of 1% lidocaine is injected through this skin wheal to a depth of 3 cm, aspirating for blood (from the inferior epigastric artery which might come in the way). This is done to block the genital branch of genitofemoral nerve.

Then by using 10 ml of 1% lidocaine a subcutaneous infiltration is done along the line of incision, spino-umbilical line and from pubic tubercle to umbilicus to block crossover fibres. The maximum dose of lidocaine with adrenaline to be given is 7 mg/kg which was kept in mind. A minimum of 10 minutes time was allowed after the block in this study for the local anesthetic to show its action. Whenever the patient complained of pain during the surgical procedure, 2ml of 1% lidocaine with adrenaline was administered at the neck of the hernial sac. At the time of hernia repair a sedative dose of propofol was administered to all patients. In the present study the following scale was adopted to grade analgesia and relaxation.

1. **Excellent:** Patient comfortable, analgesia, and surgical relaxation adequate, no supplementation required during surgery.
2. **Good:** Analgesia and relaxation adequate, minimal discomfort present during surgical procedure. This could be alleviated by supplementary local anaesthetic agent at the neck of sac.
3. **Fair:** Analgesia and relaxation adequate, in addition to infiltration of the sac patients needed a narcotic supplementation. (Inj. Fentanyl).
4. **Poor:** Patients complaining of severe intolerable pain during surgery without relaxation. These cases were converted to general anaesthesia.

Then after the surgery,

- a) Patient post anaesthesia recovery score was assessed in operation room (OR) by “criteria used to determine fast-track eligibility after ambulatory anaesthesia”.
- b) The postoperative pain relief and post-anaesthetic complications monitored.

Blood pressure, heart rate, oxygen saturation and ECG were monitored every 5 minutes till the end of surgery. Duration of surgery and analgesia, were noted. The signs, symptoms of local anaesthetics toxicity were observed.

Statistical Analysis:

Collected data were entered in Microsoft excel for further statical analysis, Qualitative data were expressed in terms of frequency and proportion while quantitative data were expressed in terms of mean and standard deviation. Statistical analysis were done with the help of software SPSS version 25

Results and Observation

In this study we have included 50 patients for inguinal hernia procedure after following inclusion and exclusion criteria, in which we have observed that, majority of the patients were lying in 18-30 years and 51-60 years; mean age of the patients was 39.36 years with SD of 12.68 years. We have observed minimum weight was 51 kg and maximum was 85 kg.

They had a mean weight 60.74 kg with SD of 7.21 kg, they. We had 68% of the patients of indirect hernia and 32% of the patients of direct hernia procedure shown in the Table No. 1

Table 1: Demographic profile of study population.

Parameters	Number of Patients	Percentage
Age (In Years)		
18-25	9	18
26-30	8	16
31-35	5	10
36-40	6	12
41-45	4	8
46-50	4	8
51-55	7	14
56-60	7	14
Weight (Kg)		
51-60 kg	26	52
61-70 Kg	21	42
71-80 Kg	2	4
81-90 Kg	1	2
Type of Hernia		
Direct	16	32
Indirect	34	68

Table 2 : Distribution of duration of surgery and analgesia and relaxation

Parameter	Number of Patients	Percentage
Analgesia and Relaxation		
Excellent	36	72
Good	8	16
Fair	4	8
Poor	2	4
Duration of Surgery (in minutes)		
20-30	1	2
30-40	27	54
40-50	18	36
50-60	4	8

36 patients had excellent type of analgesia and relaxation. 8 patients complained of discomfort during surgical handling of the hernial sac or hernia repair. 4 patients were not comfortable with the above measures and needed fentanyl depending upon their body weight. 2 patients had no analgesia at all, so general anaesthesia was instituted with induction using propofol and suxamethonium to facilitate intubation and were maintained with O₂ + N₂O + narcotic + muscle relaxant + controlled ventilation.

Table 3: Distribution of duration of analgesia

Duration of Analgesia (in minutes)	No. of Patients	Percentage
No Analgesia	2	4
151-160	1	2
161-170	4	8
170-180	4	8
181-190	3	6
191-200	6	12
201-210	7	14
211-220	12	24
221-230	2	2
231-240	3	6
241-250	1	2
251-260	1	2
261-270	2	4
271-280	2	4

We have observed that, mean duration of analgesia was 201.02 minutes and minimum duration of analgesia was 160 minutes and maximum duration was 280 minutes as shown above

Table 4 : Distribution of Recovery scale (Fast Track Criteria) after anaesthesia.

Recovery Scale	Mean \pm SD		
	0 Minutes	15 Minutes	30 Minutes
Physical activity	2 \pm 0	2 \pm 0	2 \pm 0
Respiratory stability	2 \pm 0	2 \pm 0	2 \pm 0
Hemodynamic stability	2 \pm 0	2 \pm 0	2 \pm 0
Level of consciousness	1.96 \pm 0.2	1.96 \pm 0.2	1.98 \pm 0.14
Oxygen saturation status	2 \pm 0	2 \pm 0	2 \pm 0
Post-operative pain assessment	2 \pm 0	2 \pm 0	2 \pm 0
Post-operative emetic symptoms	1.96 \pm 0.2	2 \pm 0	2 \pm 0
Total score	13.92 \pm 0.396	13.96 \pm 0.198	13.98 \pm 0.141

All the patients had a score of 12 at '0' min, all of them had a score of >12 at '15' min and '30' min. All the patients were ready to be shifted to the ward bypassing the post anaesthesia recovery room, shown in bellow table 5.

Table 5 : Distribution of patients achieved fast track eligibility score of 12 and above

Time	Number of Patients	Percentage
0 Minutes	48	96
15 Minutes	50	100
30 Minutes	50	100

Discussion:

Inguinal hernia repair is one of the frequently encountered surgical correction in men. In the international classification of diseases 9th division clinical manifestation, the number was 9 for hernias with relative value guide of 6.[5] In providing anaesthesia for inguinal herniorrhaphy, the technique chosen must be most effective with respect to speed of recovery, patient comfort, and associated incremental costs. [4] The safety and effectiveness of hernia repair using local anaesthesia is more in teaching hospitals because of low cost. [6] The advantage of local anaesthesia techniques are their safety, simplicity, effectiveness [7], budget friendliness, low rate of recurrence and low infection rate.[8] It is a method of choice in outpatient surgery for minimizing the cost of surgery. In any patient with hernia, a field block will reduce the anaesthetic risk to a minimum, allow immediate ambulation and food intake, reduce postoperative complications such as urinary retention, atelectasis and phlebitis, and almost eliminate the need for post-operative narcotic analgesia. [9]

In view of the above, the present study was undertaken to investigate field block for inguinal hernia repair using 1% lidocaine with adrenaline. In the present study 50 patients of ASA class I and II posted for elective inguinal hernia repair were studied using the above technique. Many authors have used lidocaine alone for inguinal field block [9,10] but it is short acting. Followed by that, some authors added epinephrine to lidocaine for the block because epinephrine reduces plasma concentration of lidocaine, minimizes toxicity and also prolonged post-operative pain relief. [11]

In the present study we graded 36 patients had excellent analgesia and relaxation, i.e. patient comfortable, analgesia and surgical relaxation adequate no supplementation is required during surgery. Only 8 patients had good analgesia and mild discomfort during sac manipulation which required supplementation with additional infiltration around the neck of the sac with 2ml of 1% lidocaine with adrenaline. 4 patients had analgesia graded as fair with mild pain during surgery. These patients were given fentanyl 1-2 µg/kg to alleviate the pain. 2 patients (4%) had severe intolerable pain during surgery, requiring conversion to general anaesthesia. It has been observed by various authors that at the time of traction on the sac, patients often complain of discomfort. [12,13] This finding was observed in 8 patients in our present clinical study. Some authors used narcotic for pain relief during surgery. [4, 14] In the present study 4 patients require narcotics in additional to local anaesthetic supplementation.

In the present study mean duration of surgery was 39.54 min (28-60 min) and mean duration of analgesia was 201.02 min and minimum duration of analgesia was 160 min and maximum duration was 280 min. Many studies did not mention about duration of analgesia, but many workers have shown that prolonged post-operative pain relief after ilioinguinal/ ilio hypogastric nerve block.[15] Epinephrine enhances the degree and extends the duration of lidocaine induced peripheral nerve block.[16] Study done by Covino et al supported our study for duration of analgesia.

All the patients after surgery were able to move all the four extremities without any limitation of movements. The present study correlates Kark AE et al 1990.[8] Local anaesthesia does not affect respiration so patients were able to cough freely and able to breathe deeply. Local anaesthesia does not affect circulation as it produces no alteration in physiological status. All the patients were able to maintain blood pressure within 15% of the baseline MAP value. During assessment 48 patients were awake and fully oriented throughout, but two patients who received GA were arousable with minimal stimulation. All the patients were able to maintain saturation value of > 90% on room air. Because ours is a regional technique and causes nil or minimal alteration in physiological state. In our study 48 patients were pain free, but two patients who received GA complained of mild discomfort. In our study 48 patients had no emetic symptoms but two patients who received GA had transient vomiting and retching at '0' minutes.

All the patients had a score of 12 at '0' minutes, all of them had a score of > 12 at 15 min and 30 min. All the patients were ready to be shifted to the ward/room by passing the post anaesthesia recovery room, these finding were similar to the study done by Song D et al. In our study only one patients developed wound infection, and one patient developed wound hematoma.[17]

Conclusion:

From overall observation and discussed with other study we can conclude that field block is effective technique of anaesthesia for inguinal hernia repair and it provides good quality of analgesia and relaxation intraoperatively. Field block is the best method as far as recovery profile is concerned. Field block anaesthesia provides long duration of post-operative pain relief. Field block for inguinal hernia repair results in minimal or no complications. Also lidocaine with adrenaline is effective for carrying out field block for inguinal hernia repair and provides long duration of post-operative pain relief.

Acknowledgement : None

Funding : None

Conflict of Interest : None

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