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LOCAL VS SPINAL ANEASTHESIA IN LICHENSTEIN MESH HERNIOPLASTY FOR INGUINAL HERNIA REPAIR : A PROSPECTIVE RANDOMISED CLINICAL TRIAL

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ABSTRACT

Background: Hernias are among the oldest known afflictions of human kind and elective inguinal hernia repair is a commonly performed operation in general surgery. Inguinal hernia repair can be performed by using different anaesthetic techniques. The choice of anaesthesia and advantages of any one technique over another have been a subject of debate. Patient safety and the provision of optimum operating conditions for the surgeon are two main criteria for choice of anaesthetic technique for inguinal hernia repair. Field block has been found to be the best anaesthesia for simple inguinal hernia repair. Field block provides increased safety for patients, better postoperative pain control, shorter recovery period with reduced duration of hospital stay and reduced cost, hence it is acceptable and a safe technique for inguinal hernia surgery. **Aims and objectives:** The aim of this prospective study was to compare the Safety effectiveness and satisfaction of patients undergoing hernia repair under field block versus spinal anaesthesia. **Materials and methods:** This was a Prospective Randomized Controlled Trial study conducted at Dept. Of Surgery, SSG Hospital & Medical college VADODARA. All the patients coming to SSH hospital Vadodara with unilateral inguinal hernia between age group 18-60 years during the period march 2019 – march 2021 were included in this study. 50 cases were included. 25 cases of inguinal hernia repair under local anaesthesia (Group A). 25 cases of inguinal hernia repair under spinal anaesthesia(Group B). **Results and conclusion:-** Both types of anaesthesia were effectively used in inguinal hernia repair. But the local anaesthesia had a higher incidence of intra-operative pain (20%) while the spinal anaesthesia had no incidence. Duration of surgery was longer with local anaesthesia with mean time of 49.40 mins while with spinal anaesthesia it was 44.12 mins. But the spinal anaesthesia was associated with higher incidence of post-operative pain at 6 hours post operative period (92%) while local anaesthesia was associated with only (48%) patients having at 6th post operative hour. Spinal anasthesia also had a significantly higher rates of postoperative complication like nausea, vomiting, urinary retention and head-ache. Local anaesthsia was associated with a significantly higher rates of early post-operative mobilization at 1 hour as compared to spinal anaesthesia . Hospital stay was also significantly less with early discharge of patient in local anaesthesia group as compared to spinal anaesthesia group.

KEYWORDS

Lichenstein mesh hernioplasty, hernia, Local vs Spinal Aneasthesia

INTRODUCTION

Hernia is derived from the Greek word “Herons” which means an offshoot or bulge. It was first 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]

Inguinal hernia repair is one of the most commonly performed surgeries worldwide. A wide variety of anaesthetic techniques have been used for inguinal hernia repair such a field block, spinal anaesthesia, epidural anaesthesia, combined spinal epidural anaesthesia or general anaesthesia. Yet, there is no common consensus about the optimum mode of anaesthesia. The choice of anaesthesia for hernia repair depends on factors such as patient acceptance, duration and type of surgery – open/laparoscopic, bilateral, recurrent/ strangulated hernia.

In Spinal Anaesthesia (subarachnoid block), local anaesthetic is deposited in the subarachnoid space and produces intense motor, sensory and sympathetic blockade. The widespread popularity of this technique is due to the following advantages- an awake patient, decreased metabolic stress response to surgery, decreased blood loss, reduction in pulmonary complications and less post-operative pain[2]. However, there are concerns regarding certain disadvantages such as undesirable hemodynamic responses such as hypotension, prolonged motor blockade, urinary retention and post-spinal headache. Inguinal field block is a peripheral regional blockade for hernia repair. It was introduced at the beginning of last century. It is apparently safer, simple, effective and economical without much post operative cardio-vascular complications.

It provides short duration of anaesthesia, early mobility post. Excellent results were achieved especially in elderly and high risk patients like cardiac, respiratory or hepato-renal insufficiency, and it was also found that field block is less detrimental to pulmonary function. Further more local anaesthesia administered before the incision along the line of incision produces longer postoperative analgesia because local infiltration, theoretically inhibits build of local nociceptive molecules and therefore, there is better pain control in the postoperative period.

Field block for inguinal hernia repair is the most cost-effective anaesthetic technique for out patients undergoing unilateral inguinal herniorrhaphy with respect to speed of recovery, patient comfort and associated incremental costs[3].

Hence, We have attempted to compare the effectiveness and benefits of field block anaesthesia with that of popular conventional spinal anaesthesia.

Aim of Study

Aim was to compare hernioplasty under local vs spinal anaesthesia in respect of the following

1. Pain felt during surgery.
2. Post operation pain.
3. Time taken for surgery.
4. Incidence of post operative complications.
5. Number of extra analgesic doses received postoperatively
6. Mean duration (days) of hospital stay from day of surery

METHODS AND MATERIALS

Inclusion Criteria: [7,8]

1. Unilateral inguinal hernia
2. Age group :- 18 – 60 years
3. Patients who were willing to participate in the study.

Exclusion Criteria [7,8]

1. Femoral hernia
2. Bilateral inguinal hernia
3. Recurrent inguinal hernia-
4. Uncontrolled Diabetes and respiratory problems
5. Incarcerated hernias and strangulated hernias
6. Patients not willing to give informed consent.
7. BMI > 30, morbidly obese patients.
8. Patients who needed to be converted to GA from SA.

Study Design :

This is a Prospective Randomized controlled Trial study conducted at Department of Surgery, SSG Hospital & Medical college VADODARA. All the patients coming to SSH hospital Vadodara with unilateral inguinal hernia between age group 18-60 years during the period march 2019 – march 2021 were included in this study . After taking Informed and written consent, patients were randomly allotted by Envelope method.

'GROUP-A' - Local anesthesia group
'GROUP-B'. - spinal anesthesia group

Group A : Local Anaestheisa[9,10]
The local anaesthetic drug was prepared as follows –
- 2% lignocaine hydrochloride 17.5 ml
- 0.5% bupivacaine hydrochloride 17.5 ml
- Sterile Water for Injection 35 ml
- 7.5% w/v Sodium Bicarbonate 4 ml
- Adrenaline Tartarate (1:2,00,000) 0.2 ml
- Total volume of drug 75 ml

Point block technique:- [9,10]
- The mid inguinal point area was infiltrated with 10 ml of LA prepared
- The pubic tubercle area was infiltrated with 10 ml of LA prepared
- A point below the inguinal ligament lateral to femoral artery is infiltrated with 10 ml of LA prepared.(blocks genital branch of genitofemoral nerve)
- A point 2 cm above and medial to anterior superior iliac spine was infiltrated with 10 ml of LA (blocks iliohypogastric nerve)
- The line of skin incision was infiltrated with 10ml LA
- During dissection of the hernial sac inject 10 ml of LA prepred into the neck of the hernial sac.

Group B : Spinal Anesthesia[11]
- Spinal anesthesia was used for inguinal hernia repair with the help of anesthetist.
- All Patients were attached to the cardiac monitor and pulse oximeterall throughout the procedure.
- For the LA group, monitoring was done by an assistant.
- The Anesthetist was monitoring those who will undergo the procedure under spinal anesthesia.
- In all cases of local anasthesia, an Anesthesia Consultant was on standby for any cases needing conversion to general anesthesia.
- Rest of the operation was done according to the Lichtenstein Mesh hernia

Technique :- [12] .
- Sutures was used for skin closure.
- Skin sutures was removed after the 10th postoperative day.
- All the cases received the standard treatment for pain control in the postoperative period during the time of study
- Injection tramadol 50 mg in 100 ml NS was given every 12h for 1st 24 hours.
- Tab. Diclofenac 50mg 1TDS 24hrs onwards till discharge of patient.

RESULTS

TIME TAKEN FOR SURGERY	MEAN TIME
SPINAL ANAESTHESIA	44.12 MINUTES
LOCAL ANESTHESIA	49.40 MINUTES

TIME TAKEN FOR DISCHARGE	MEAN TIME
SPINAL ANAESTHESIA	3.16 DAYS
LOCAL ANESTHESIA	2.60 DAYS

POST OPERATIVE OBSERVATION	LOCAL ANESTHESIA	SPINAL ANESTHESIA	P-VALUE
NAUSEA/VOMITING	2(8%)	5(20%)	0.29
URINARY RETENTION	0	4(16%)	0.02
AMBULATION AFTER 1 HOUR OF SURGERY	21(84%)	0	<0.001
POST OPERATIVE HEAD ACHE	1(4%)	6(24%)	0.07

COMPLICATION	LOCAL ANESTHESIA	SPINAL ANESTHESIA	TOTAL(LOCAL + SPINAL)	P -VALUE
SEROMA	4(16%)	3(12%)	7(28%)	0.68
SCROTAL EDEMA	4(16%)	3(12%)	7(28%)	0.68
HEMATOMA	3(12%)	2(8%)	5(20%)	0.64
WOUND INFECTION	2(8%)	2(8%)	5(20%)	1

VAS	LOCCAL ANESTHESIA	SPINAL ANESTHESIA
0	20(80%)	25(100%)
1 TO 4 (MILD)	5(20%)	0
5 TO 6 (MODERATE)	0	0
7 TO 9 (SEVERE)	0	0
10 (WORST)	0	0

DISCUSSION
In our present study the maximum patients were in the range of 31-40 years and is comparable with other studies like in 'Lousies & Wendell' study and 'Delvin' study , the maximum patient were in the age group 31-40 years age group while in the 'Bholasingh' study the maximum age group was in the range of 41-50 years .

In our present study all patients were male & none were females. The percentage of females in this study is less compared to other studies. This may be due to less awareness of women about hernia. Socio-economic & educational level of the female patients contribute to less number of female presenting to hospital with inguinal hernia in early stage in our study. Small population size under study has also contributed to this gender bias found in our study. This finding was consistent with the study by Ira Rutkoff[13] , 90% inguinal hernia cases were in males patients & 10% were females and with the study by Liechenstein[14] 94% were male patients & 6% female patients. Occurring at any age males are more commonly affected then females.

In our study the majority of hernias were indirent hernia (64%) while direct hernia were only 36%. In louise and wendell study the indirect hernia were 65% while direct hernia were 35%. Similarly in RHS study, indirect hernia was 63% while direct hernia were 35% and in L-Palamivelu study, the indirect hernia were 76% and direct hernia were 24 %. In our study, we observed that 66% of patients have right side hernia while 34% of the patients had a left side hernia. All the four studies (louies and Wendell, Bholasingh study, Delvin study and BK study) had showed a higher proportion of right sided hernia in conparision to left side hernia. Right sided inguinal hernia is common type in both direct & indirect type of hernia. This is due to later descent of right testis & higher incidence of failure of closure of processes vaginalis.

In our present study the average time taken for surgery was 49.40 mins in local anaesthesia group and 44.12 mins in spinal anaesthesia group with the difference being insignificant statistically. This result was also observed in other studies which showed that the time taken for surgery in both the groups were statistically insignificant.

In louies and weldell study 10% patients had felt pain during operation while in Bholasingh study 22% patients had felt pain. In delvin study 15 % patients felt pain and in BK study 18% patients felt pain In our study 20% patients had felt pain during surgery which is comparable with the other studies compared.

In Louies and Wendel study 32% of patients in local anaesthetic group had pain at 6hrs post-operatively while in spinal anesthetic group 84% patients had developed pain. Similarly in Bholasingh sidhu study, 52% in local anasthetic group and 96% in spinal anaesthetic group developed pain, and in Delvin study , 37% in local anaesthetic group and 88% in spinal anaesthetic group developed pain post operatively. In our present study, 48% of patient in local anaesthetic group and 92% in spinal anaesthetic group had developed pain sensation 6hour after surgery. This finding is comparatively with other studies.

Our study when compared to David V Young study in term of nausea, vomiting, urinary retention, post operative headache and ambulation at 1 hour is very similar in every manner. In our study people operated under local anaesthesia had significantly over all less complications except for mild pain during surgery. In patients operated under spinal there was significant general complications like post operative urinary retention & headache.

Most of the patients in LA group (>84%) were ambulant after 1hr of the surgery but none of the patients were in SA group.

Complications of Hernia Repair
The local complications like seroma , hematoma, scrotal edema, taken together from both the groups , 28 % had seroma, 28% had scortal edema , 20% had hematoma , 16% had infection Local complication

like seroma, hematoma, scrotal edema, wound infection occurred in both the groups. When compared there was no significant difference between the two groups. In present study, the type of anaesthesia had no significant influence on local complications. Only the skills, technique, gentleness & experience of the surgeons have influence on these complication.

All complications treated conservatively with scrotal support & analgesics they resolved in 15-20 days. None of the cases developed chronic groin pain, testicular atrophy & paraesthesia. In previous studies infection occurred in 7.8% cases (T.B Burke, 1978), 5.9% of cases (Maxemo Deysine, 1991), 1.2% of cases (B Millant 1993), & 2% cases in (T Faish 2000). These are similar to the present study & are comparable with the previous studies.

Duration of Hospital Stay

In our study 92% of the LA group discharged by 3th day & more than 64% patients in SA group by 3th day. Mean duration of hospital stay in local anaesthesia group was 2.60 days while in spinal anaesthesia group was 3.14 days. Previous study shows that post operative stay for short stay surgery was 3-4 days (Sven Kornhale 1976), 2.2 days (Makuria 1979), 3.8 days (S R Canon 1982), 2-3 days (Glassow 1984). David Young 1987 study shows that 4.4days for LA group & 6 days for SA group (present study LA 4.7 +/- 2.2 days & SA 6.7+/-2 days).

CONCLUSSION

In our study we found that both local & spinal anaesthesia can be used for hernia repair on short stay bases, but spinal anaesthesia has higher complication rates compared to local anaesthesia. There is significant increase in general complications like hypotension, urinary retention, & headache in spinal anaesthesia & local complications like seroma, hematoma, scrotal edema & recurrence were similar in both groups. Local anaesthesia is with less immediate post operative complication, best suitable for short stay surgery when compared to spinal anaesthesia. When short stay service is implemented their will considerable savings to hospital service & to the patients

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