



Original Research Article

Comparison of hernioplasty under local anesthesia v/s spinal anesthesia

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Abstract

Background: Hernia is a common surgical problem which requires good surgical skill as well as good knowledge about anatomy and various repair of hernia. Hernia is a protrusion of a viscous of part of viscous through a normal or abnormal opening in the wall of its containing cavity. Inguinal hernioplasty can be done under general anesthesia, spinal/epidural and local anesthesia. The choice of anesthesia depends upon a variety of factors viz patient's acceptance, surgeon's wishes, safety, feasibility and cost etc. Recently there has been revival in the use of local anesthetic technique for hernioplasty.

Aim: To study comparison of local anesthesia v/s spinal anesthesia for per-operative and post-operative outcome measures.

Material and methods: We have done comparative study of total 100 patients (50 patients under local anesthesia and 50 patients under spinal anesthesia), with follow up period of 60 days. The present study included male patients of uncomplicated inguinal hernia with ASA grade 1 to 3. Patients were selected without bias of type (Direct/Indirect) and extent. All patients were explained about both the methods of anesthesia for hernioplasty, those who willing for local anesthesia were selected for this group and similarly spinal anesthesia group selected (Total 100, 50 in each group).

Results: All patients were explained about both the methods of anesthesia for hernioplasty, those who willing for local anesthesia were selected for this group and similarly spinal anesthesia group selected (Total 100, 50 in each group). In local anesthesia group 7 (14%) patients had intra-operative discomfort in form of pain. 64% of patients of local had mild pain and 38% had moderate pain. None of the patients belonged to severe pain group. In spinal anesthesia, 6% of patient had severe pain, 22% patients had mild pain and 72% patients had moderate degree of pain. Local anesthesia was associated with less post-operative complication, in our study no patient develop complication like nausea, vomiting, urinary retention, or headache.



Conclusion: hernioplasty under local anesthesia was an acceptable alternative to spinal anesthesia for hernioplasty especially with regard to operative condition, patient's surgeon's satisfaction, post-operative pain relief, complications and cost effectiveness.

Key words

Inguinal hernia, Hernioplasty, Local anesthesia, Spinal anesthesia.

Introduction

Hernia is a common surgical problem which requires good surgical skill as well as good knowledge about anatomy and various repair of hernia. Hernia is a protrusion of a viscous of part of viscous through a normal or abnormal opening in the wall of its containing cavity [1]. Hernia word derived from Greek meaning an offshoot, a budding, or bulge. The Latin word hernia means a rupture or tear. The external abdominal hernia is the most common form; the most frequent varieties being the inguinal, femoral and the umbilical, accounting for 75 % of cases [2]. The rarer form constitutes 1.5%, excluding incisional hernia. Sir Ashley cooper had said "No disease in the human body, belonging to the province of the surgeon, requires in its treatment a better combination of accurate anatomical knowledge with surgical skill than Hernia in all its varieties [3]. Hernia repair undergone so many modification till now, at present most acceptable is Lichtenstein tension free hernioplasty. Inguinal hernioplasty can be done under general anesthesia, spinal/epidural and local anesthesia. The choice of anesthesia depends upon a variety of factors viz patient's acceptance, surgeon's wishes, safety, feasibility and cost etc. Although the technique of local anesthesia is known to both surgeons and anesthetists since last century, most of the hernia repairs are done under spinal or general anesthesia. Recently there has been revival in the use of local anesthetic technique for hernioplasty.

Aim and objectives

To study comparison of local anesthesia v/s spinal anesthesia for per-operative and post-operative outcome measures.

- Patient's acceptability to both the technique
- Per-operative comfort of patients
- Post-operative pain and requirement of analgesia
- Post-operative complications
- Hospital stay
- Return to work
- Cost effectiveness

Material and methods

We have done comparative study of total 100 patients (50 patients under local anesthesia and 50 patients under spinal anesthesia), with follow up period of 60 days.

Selection of patients

The present study included male patients of uncomplicated inguinal hernia with American Society of Anesthesiologists (ASA) [4] grade 1 to 3. (ASA-1 normal healthy patient, ASA-2 patient with systemic disease, ASA-3 patient with severe systemic disease, ASA-4 patient with severe systemic disease that is constant threat to life) Patients were selected without bias of type (Direct/Indirect) and extend {Grade-1 Hernia as bulge in inguinal region only (incomplete), Grade-2 Hernia reaches up to root of scrotum (incomplete), Grade-3 Hernia reaches up to bottom of scrotum (incomplete)}. All patients were explained about both the methods of anesthesia for hernioplasty, those who willing



for local anesthesia were selected for this group and similarly spinal anesthesia group selected. (Total 100, 50 in each group)

Exclusion criteria

- Patients with ASA grade 4 or more
- Pediatric age group
- Irreducible hernia
- Strangulated hernia
- Incarcerated hernia
- Recurrent hernia

Anesthesia

Spinal anesthesia was by 3 ml of 0.5 % bupivacaine heavy [5] using a 23 gauge spinal needle through the L3-L4 intervertebral space in the lateral decubitus position while the patient was lying on the same side as the hernia. Local anesthesia before giving the local anesthesia each patient was explained regarding the procedure and asked so say any time during procedure if he finds discomfort. In all patients, local anesthesia was given by Surgeon. Anesthetic was kept stand by. (Xyloadrenaline 10 ml and 0.5 % Bupivacaine 10 ml and diluted with 20 ml of distil waster, total volume is 40 ml)

Protocol for management of per-operative pain and discomfort

Step-1: If patients find discomfort while surgery. Additional 5-10 ml local infiltrated as and when require

Step-2: If patients find more discomfort, then Injection Midazolam 1 mg IV.

Step-3: If patients find more pain then Injection Fentanyl (1-2 mcgm/kg) IV.

Step-4: If still surgery was not possible due discomfort of patient then converts the procedure under general anesthesia.

Post-operative pain was graded according to visual analogue score [6] as follow (add "+" if taking anesthesia): P0 - VAS Score 0 - no pain, P1

- VAS Score 1-3 - Mild pain, P2 - VAS Score 4-6 - Moderate pain, P3 - VAS Score 7-10 - Mild pain.

All patients are asked to come on 7, 15, 30 and 60 day follow up.

Results

We have done study of total 100 hernioplasty, 50 under spinal anesthesia (SA) and 50 under local anesthesia (LA), and obtained following results. In this study, we have operated 8 cases of bilateral hernia under local anesthesia and 10 cases of bilateral hernia under spinal anesthesia; we have considered all these patients as single patients and complain on either side considered as positive findings. Patients' characteristics were as per **Table – 1**. Most of the patients having Grade 1 hernia (78% in LA and 70% in SA), two patients of grade 3 hernia operated under local anesthesia, one of them required additional infiltration and deep ring (5 ml) and another one didn't find comfort with additional infiltration even so converted to general anesthesia (GA).

In all the patients operated under spinal anesthesia we didn't find any per operative difficulty regarding anesthesia. In local anesthesia group, 7 (14%) patients had intra-operative discomfort in form of pain as per **Table - 2**. These patients were managed according to our protocols those mention previously.

Patients operated under local anesthesia having indirect hernia had more discomfort compared to direct hernia as per **Table - 3**.

Per operative discomfort was more in age group 20-49, compare to 50-89 age groups (22.7% in 20-49 and 10.7% in 50-89) as per **Table - 4**.

Patients operated under local anesthesia had less postoperative pain compare to spinal group.



64 % of patients of local had mild pain and 38 % had moderate pain. None of the patients belonged to severe pain group. In spinal anesthesia 6% of patient had severe pain, 22% patients had mild pain and 72% patients had moderate degree of pain as per **Table - 5**.

Patients operated under local anesthesia were mobilized immediately. Three patients of spinal anesthesia group had retention of urine, simple red rubber catheterization done and bladder emptied, later they can pass urine themselves as per **Table - 6**.

Local anesthesia is associated with less post-operative complications; in our study no patient developed complication like nausea, vomiting, urinary retention, or headache. Two patients had wound infection single stitch was removed and purulent discharge came out. Both patients were given oral antibiotics, none of the patient required re-admission or mesh removal as per **Table - 7**.

Patients operated under local anesthesia had less postoperative pain on day-0 (64%-P1, 38%-P2) compared to spinal anesthesia group (22%-P1, 72%-P2, 6%-P3). This difference was also significant on 1st postoperative day. (Local 92%-P1 and 38%-P2 compare to spinal 66%-P1 and 34%-P2) as per **Table - 8**. On day 15th, 30th, 60th there was no significant difference in pain score in both the group of the patients.

Local anesthesia was cost effective than spinal anesthesia as per **Table - 9**.

Discussion

A study performed by Uma Srivastva, et al. [7] had taken 92 male patients of ASA grade I and II, age 26-27 years with unilateral, reducible inguinal hernia. They exclude the patients with significant systemic illness and those with huge hernial sac, sensitive to local anesthetic. In study

performed by Uma Srivastva, et al. [7], mild pain or discomfort was reported by 27 % patients in local (14% in our study) and 7% patients in spinal group. In most of the patients no analgesic supplementation required. In one patient of local anesthesia group conversion to GA was required. A most commonly perceived problem of local anesthesia is pain at infiltration. This can be extreme enough to dissatisfy the patients with procedure [8]. In our study, local anesthesia group 3 patients had good operative condition, but had pain while infiltration of local, so these patients were not satisfied. Study done at Royal College of Surgeon of England by P Sanjay and A Woodward said that addition of Sodium Bicarbonate to buffer local anesthetic solution reduce pain, both during administration and during the procedure [9]. In indirect inguinal hernia there is more dissection require compare to direct. In local anesthesia pain occur mostly while separating sac from cord and this can be minimized by isolating nerve first and minimum traction on sac. Young patients have good muscle tone compare to old age so while dissection more traction need to apply in young patients that may be one the reason of more per-operative discomfort in young age group.

Study of Hedef Ozgun, et al. [10], Adnan Menderes Hospital, Aydin, Turkey also shows that at 24 hours the local anesthetic group had lower pain score than the spinal group (p=0.02) and local anesthetic group had 26 Diclofenac injection and spinal anesthetic group had 35. In a study done by Uma Srivastva, et al. [7], also mention in their study majority of patients in local anesthetic group were able to walk (83%), take oral (03%) and passed urine (11%) by 6hrs after the surgery. In study performed by Hedef Ozgun, et al. [10], Adnan Menderes Hospital, Aydin, Turkey, Two patients in the local group had minor complication; one patient developed a hematoma that didn't required reoperation and settled. One superficial wound infection



resolved with oral antibiotics. No mesh infection occurred.

In a study done by Uma Srivastva, et al. [7], urinary retention requiring catheterization occurred in 7 (22%) patients in spinal anesthesia group. Study of Young of comparison of local, spinal and general anesthesia for inguinal hernia repair shows that local anesthesia was superior to spinal anesthesia term of urinary retention [11]. In study of study done at Royal Collage of Surgeon of England by P Sanjay and A Woodward incidence of chronic groin pain is 27.6% the majority of the patients complained of very mild chronic groin pain (78.6%) [9]. In Study performed by Hedef Ozgun, et al., Adnan Menderes Hospital, Aydin, Turkey, also mention that there was no difference in the time taken to return to normal activities, work [10].

Conclusion

Hernioplasty under local anesthesia was an acceptable alternative to spinal anesthesia for hernioplasty especially with regard to operative condition, patient's surgeon's satisfaction, post-operative pain relief, complications and cost effectiveness.

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Table – 1: Patients’ characteristics.

Characteristics	LA (n=50)	SA (n=50)
Mean age (years)	50.4	46.48
Mean body weight (kg)	64.4	66
ASA Grade		
(No. and %) I	32 (64%)	39 (78%)
II	16 (32%)	10 (20%)
III	2 (4%)	1 (2%)
Type of hernia (No. and %)		
Right/Left/Bilateral	31/11/8 (62%, 22%, 16%)	21/19/10(42%, 38%, 20%)
Direct/Indirect	21/29 (42%, 58%)	22/28 (44%, 56%)
Grade-1	39 (78%)	35 (70%)
Grade-2	9 (18%)	11 (22%)
Grade-3	2 (4%)	4 (8%)

Table – 2: Operative condition, intra-operative discomfort and satisfaction with anesthesia.

Variables (No. and %)	LA (n=50)	SA (n=50)
Operative condition		
Excellent/Good/Poor	43/6/1 (86%, 12%, 2%)	50 (100%)/0/0
Intra-operative discomfort	7 (14%)	0
Satisfaction with anesthesia (Satisfy/Not Satisfy)		
Surgeon	43/7 (86%, 14%)	50 (100%)/0
Patients	40/10 (80%, 20%)	50 (100%)/0

Table – 3: Per-operative discomforts related to type and grade of hernia (for LA only).

Hernia (n=50)	Yes (No. and %)	No (No. and %)
Direct (n=21)	2 (9.5%)	19 (90.5%)
Indirect (n=29)	6 (20.7%)	23 (79.3%)

Table – 4: Per-operative discomforts related to the age-group of patients (for SA only).

Age in years	Yes (No. and %)	No (No. and %)
20-49 (n=22)	5 (22.7%)	17 (77.3%)
50-89 (n=28)	3 (10.7%)	25 (89.3%)

Table – 5: Post-operative pains (1st 24 hours).

Grade	LA (n=50)	SA (n=50)
P0 (VAS 0)	0	0
P1 (VAS 1-3)	31 (64%)	11 (22%)
P2 (VAS 4-6)	19 (38%)	36 (72%)
P3 (VAS 7-10)	0	3 (6%)

Table – 6: Activities after 6 hours of surgery.

Activities	LA (n=50)	SA (n=50)
Ambulation	43 (86%)	37 (74%)
Oral intake	50 (100%)	50 (100%)
Passing urine	50 (100%)	47 (94%)

Table – 7: Post-operative complications.

Complication	LA (n=50)	SA (n=50)
Nausea / Vomiting	0	2 (4%)
Urinary retention	0	3 (6%)
Headache	0	3 (6%)
Local wound	6 (12%)	0

Table – 8: Post-operative pains in follow-up period from 0 to 60 days.

Post operative day	Local (n=50)				Spinal (n=50)			
	P0	P1	P2	P3	P0	P1	P2	P3
0	0	31 (64%)	19 (38%)	0	0	11 (22%)	36 (72%)	3 (6%)
1	0	46 (92%)	4 (8%)	0	0	33 (66%)	17 (34%)	0
2	30 (60%)	20 (40%)	0	0	4 (8%)	46 (92%)	0	0
7	35 (70%)	15 (30%)	0	0	23 (46%)	27 (54%)	0	0
15	41 (82%)	9 (18%)	0	0	38 (76%)	12 (24%)	0	0
30	44 (88%)	6 (12%)	0	0	44 (88%)	6 (12%)	0	0
60	47 (94%)	3 (6%)	0	0	46 (92%)	4 (8%)	0	0



Table – 9: Cost effectiveness in rupees.

	Local (Rs.)	Spinal (Rs.)
Post-operative ward	-	200
Investigations	400	600
Operative charge	500	500
Anesthetic charges	-	300
Drugs	600	1000
Mesh and sutures	1000	1000
Total	2500	3600