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COMPARATIVE STUDY OF NERVE BLOCK V/S SPINAL ANESTHESIA IN LICHTENSTEIN TENSION FREE MESH INGUINAL HERNIA REPAIR

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ABSTRACT

Introduction

Inguinal hernia most frequent problem in human being adult as well as children suffer with it. Inguinal hernia repair done under “anesthesia” {such as local anesthesia, spinal anesthesia, nerve block, epidural anesthesia, & general anesthesia}, depending upon number of variables i.e. patient’s acceptance, surgeon’s preference, safety, practicality and cost effectiveness.

Objectives

To compare nerve block versus spinal Anesthesia in Lichtenstein tension-free mesh inguinal hernia repair

Methods

The Present study, conducted as a hospital-based comparative prospective study at the Department of General Surgery, Muzaffarnagar Medical College & Hospital, Muzaffarnagar, U.P., aimed to investigate the efficacy of two different anesthesia techniques in inguinal hernia repair. Over an 18-month period, 100 patients meeting the inclusion criteria. The study utilized a combination of ilioinguinal and iliohypogastric nerve blocks alongside field blocks for anesthesia administration, ensuring proper analgesia and relaxation. Cases were grouped based upon fitness for spinal anesthesia, comorbidities, and patient preference. Group A underwent mesh repair under spinal anesthesia, while Group B received nerve block via inguinal field block technique.

Results

In the <40 year group, Nerve Block accounts for 2.0% of cases while Spinal Anaesthesia accounts for 10.0%. In the 41-50year group, Nerve Block represents 64.0% of cases, whereas Spinal Anaesthesia represents 60.0%. In the >50 age group, Nerve Block represents 34.0% of cases, and Spinal Anesthesia represents 30.0%.

On comparison of seroma occurrence between Group A and Group B revealed interesting insights. In Group A, comprising 50 cases, 45 cases (90.0%) exhibited seroma, while 5 cases (10.0%) did not. Similarly, in Group B, consisting of another 50 cases, 47 cases (94.0%) showed seroma, with 3 cases (6.0%) without it. When considering both groups collectively, out of 100 cases, 92 cases (92.0%) had seroma, while 8 cases (8.0%) did not.

Conclusion

We came to the conclusion that all patients with primary inguinal hernias benefit from Lichtenstein mesh repair performed under local anesthesia for a number of reasons. Simpleness, dependability, efficacy, safety, a smooth recovery period marked by easily managed pain, a prompt return to full range of activities, and high patient satisfaction are a few of these.

Keywords

Lichtenstein mesh, Hernia, VAS score

INTRODUCTION

Surgery is the definitive treatment of hernia and remains one of the most common operations in general surgery worldwide. Inguinal hernias are 9 times more common in male than in females. Lifetime risk of developing groin hernias being approximately 15% in males and 5% in females. Open method of inguinal hernia repair remains popular worldwide. It can be performed under all types of anesthesia- general, spinal, epidural and local. Open repair under local anesthesia has been reported to be both safe and economic. With the arrival of “Day care Surgery” in inguinal hernia repair, local anesthesia has a pivotal role as it reduces the cost, anesthesia complications and duration of hospital stay.

AIM AND OBJECTIVES

To compare nerve block versus spinal anesthesia in Lichtenstein tension-free mesh inguinal hernia repair

OBJECTIVE

Compare two method of anesthesia that is nerve block v/s spinal anesthesia in Lichtenstein tension-free mesh inguinal hernia repair in terms of

1. Operative time 2. Complication 3. Length of hospital stay 4. Post operative pain 5. Cost effectiveness.

MATERIALS AND METHODS

1. Study design: Hospital based Comparative prospective study.

2. Study place : Department Of General Surgery, Muzaffarnagar Medical College & Hospital, Muzaffarnagar, U.P.

3. Study Population: Patients presenting with inguinal hernia who are admitted indoor patients (IPD) of department of General Surgery, Muzaffarnagar Medical College will be considered for the study.

4. Study Duration: 18 months .

5. Sample Size: 100 patients

6 Inclusion Criteria :

18-90 year male patient with bilateral/unilateral inguinal hernia , who are willing to participate in the study and are able to understand and give consent for study in Hindi and/or English

7 Exclusion Criteria :

1. Complicated hernia

    a. irreducible hernia,

    b. Obstructed hernia,

    c. Strangulated hernia

2. All patients who underwent abdominal emergency operations,

3. Morbid obese.

4. Groin hernia other than inguinal hernia

5. Recurrent hernia

FOLLOW UP: 10 day

Procedure of local block for inguinal hernia repair

Study included the IIN and IHN blocks with the field block to achieve improved analgesia and relaxation. Following all aseptic precautions, a local anesthetic solution is prepared with the following ingredients: 15 mL of 2% Xylocaine with ADR, 15 mL of 0.5% Bupivacaine, and 15 mL of normal saline. There is a patient on the operating table, face down.

After the aspiration test came back negative, a local anesthetic was given at each of the designated sites .

A mark situated two millimeters medial to the ASIS and two cm above it. The next step was to insert a 23-gauge, 4cm needle perpendicular to the skin.

A syringe containing a diluted local anesthetic solution was also used. There was a resistance in the region of the external oblique aponeurosis and another in the region of the internal oblique muscle.

After this second resistance, 5-7 ml of local anesthetic solution was injected. After injecting the medication, the needle is withdrawn. We then administered a local anesthetic solution that was 1-2 mm and 5-7 ml in volume. Two or three

milliliters of medicine is injected into the subcutaneous tissue using a needle shaped like a fan.

The classic incision is made 2.5cm above and parallel to the medial three -fifth of the inguinal ligament, but more horizontally placed skin crease incision will produce more acceptable scar and then 2-3 milliliters of LA is injected into it to obstruct the genital branch of the genitofemoral nerve, which has now been severely constricted. Next, the operating side's pubic tubercle is used to demarcate the surgical site.

Procedure started by inserting a 23 gauge needle with an attached syringe towards the anterior superior iliac spine at an angle of approximately 50/60 degrees. blocked sub dermic nerve endings by injecting 5-7 ml of local anesthetic solution into the sub dermic plane. To block crossover fibers, 3 ml intradermally. Subcutaneous and intradermal infiltrations utilizing 5-7 ml of mixture are administered beginning at the pubic tubercle and progressing upwards to the umbilicus.

It took the surgeon about ten minutes to verify the anesthesia at the incision site, and then the operation could proceed. The Patient’s vital sign (ECG, NIBP, HR, and SPO2) were constantly monitored until the procedure was completed. The symptoms of local anesthetic toxicity were documented. A pulling or dragging sensation may be experienced by the patient after the inguinal canal has been opened and the hernia sac has been gripped by the surgeon. The next step is to inject a local anesthetic solution into the sac's neck. If the patient feels pain throughout the procedure, the surgeon is free to inject a local

anesthetic whenever necessary. During surgery, analgesia and relaxation were evaluated using the following scale.

Surgery goes well; patient is relaxed and pain-free

Great: Adequate analgesia and relaxation, with minimal discomfort during surgery that was relieved by administering an additional local anesthetic agent around the neck of the sac.

Good: Patients need narcotic supplementation in addition to appropriate analgesia and relaxation, and infiltration of the sac.

Patients who did not receive GA and complained of unbearable pain during surgery had a poor outcome. This block was deemed to have failed.

The entire duration of analgesia was evaluated in all patients, which is defined as the time it takes from the onset to effect of the medication till the patient reports feeling pain.

PATIENTS WERE DIVIDE IN GROUP A AND GROUP B.

IN group A 50 patients AND GROUP B 50 patients ON THE BASIS OF :-

- Fitness for spinal Anesthesia
- Comorbidity OF the PATIENTS
- Choice of patients for local Anesthesia /spinal Anesthesia after explaining procedure

GROUP –A

MESH REPAIR UNDER SPINAL ANESTHESIA TECHNIQUE:- Spinal anesthesia involves administering local anesthetic agent

(BUPIVACAINE) into the subarachnoid space.

GROUP B:-

Mesh hernia repair under nerve block by inguinal field block technique (lignocaine with Adrenaline: bupivacaine: normal saline). After the procedure, patients were asked how they felt regarding the pain or discomfort: none, severe, or some. When necessary, the pain was alleviated by injecting a solution of the medication at the operation site, up to the maximum amount that is allowed.

- Tension free Lichtenstein hernioplasty was done in both groups. The material used for hernioplasty was polypropylene prosthetic mesh.

EVALUATION

1. OPERATIVE TIME: Operative time was noted in minutes using a stop watch from skin incision till last suture taken

2. PAIN :-Immediately post operatively injection diclofenac 75 mg i/m is given to the patients of both groups, subsequently putting them on oral aceclofenac (100mg) plus paracetamol(325mg) twice a day.

POST OPERATIVE PAIN : immediately 6 hour, 24 hour, 3rd post operative DAY pain was noted according visual analogue scale .

3. DURATION OF HOSPITAL STAY:-from the day of surgery to the day of discharge is recorded

4. COMPLICATI0NS like a) seroma/haematoma b) surgical site of infection c) urinary retention is noted during post operative period the removal of sutures

5. COST:- Approximate total cost for hospital admission investigation and medication was calculated for the both the groups from the day of surgery till removal of sutures.

6. STATISTICAL DATA ANALYSIS & SOFTWARE:

In order to get the quantitative data, the Mean + Standard deviation is computed. For qualitative data, we shall compute percentages and proportions. To determine the degree of connection between the categorical variables, the chi-square test employed. A p-value less than 0.05 is considered as statistically significant when using SPSS (Version 20) Software.

RESULTS

In the Present study on comparison of the distribution of cases between the two groups (Nerve Block and Spinal Anesthesia), we can look at the percentages of cases in each group within each age category:

- **Table 1 Duration of surgery in between the two groups**

The mean duration of surgery in the nerve block group was 69.50±8.94 min and spinal anesthesia group was 37.70±6.08 minutes

	Nerve Block		Spinal anesthesia		Z	p-value
	Mean	SD	Mean	SD		
DURATION OF SX(MINS)	69.50	8.94	37.70	6.08	-8.682	0.001

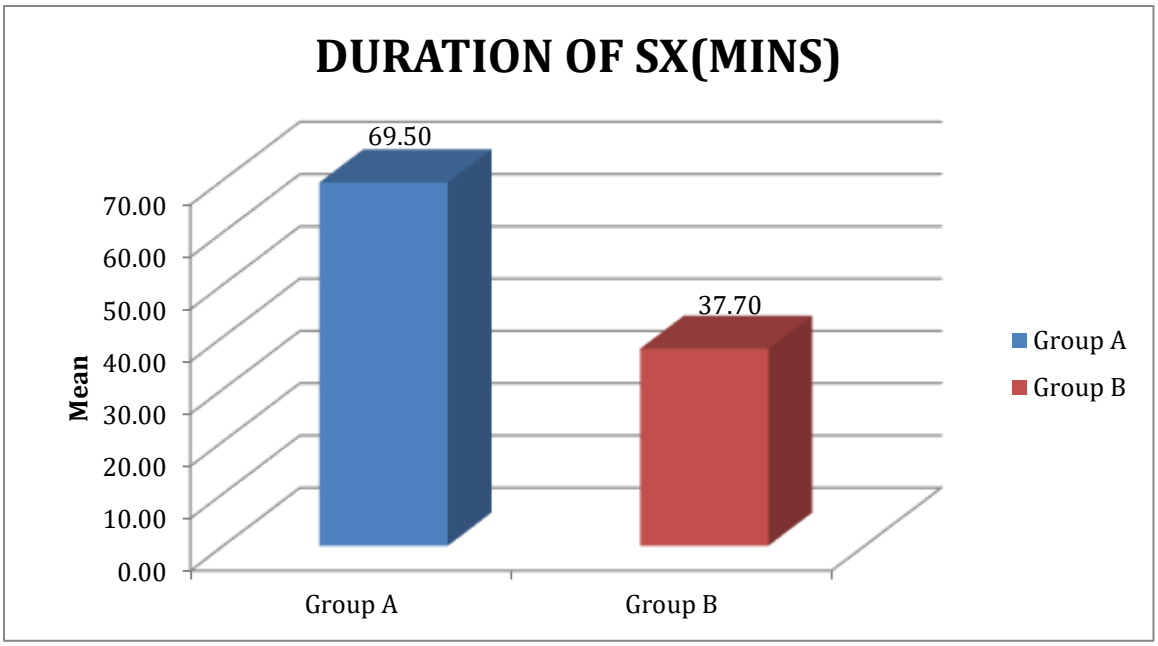

Figure 1 Duration of surgery between the two groups

Table 2 Length of hospital stay between the two groups

The mean length of hospital stay in the nerve block group was 16.88±8.48 hours and in spinal anesthesia group was 38.88±10.44hour

	Group A		Group B		Z	p-value
	Mean	SD	Mean	SD		
LENGTH OF HOSPITAL STAY (Hours)	16.88	8.48	38.88	10.44	-7.610	0.001

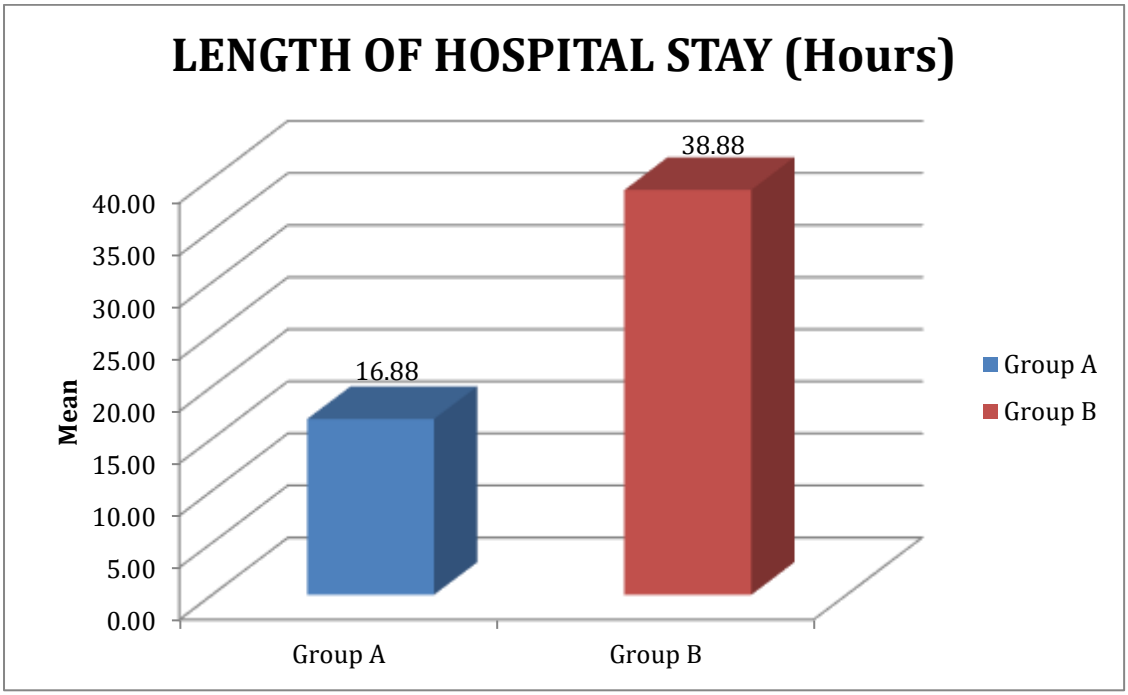

Figure 2 Length of hospital stay in between the two groups

Table 3 Cost effectiveness in between two groups

table 3 presents a comparison of the cost-effectiveness between the two groups The p-value associated with this comparison is 0.001, which is less than the conventional threshold of 0.05, indicating a statistically significant difference in cost-effectiveness between the two groups.

	Group A		Group B		Z	p-value
	Mean	SD	Mean	SD		

COST EFFECTIVNESS	**2404.00**	**124.47**	**6620.00**	**435.19**	**-8.827**	**0.001**

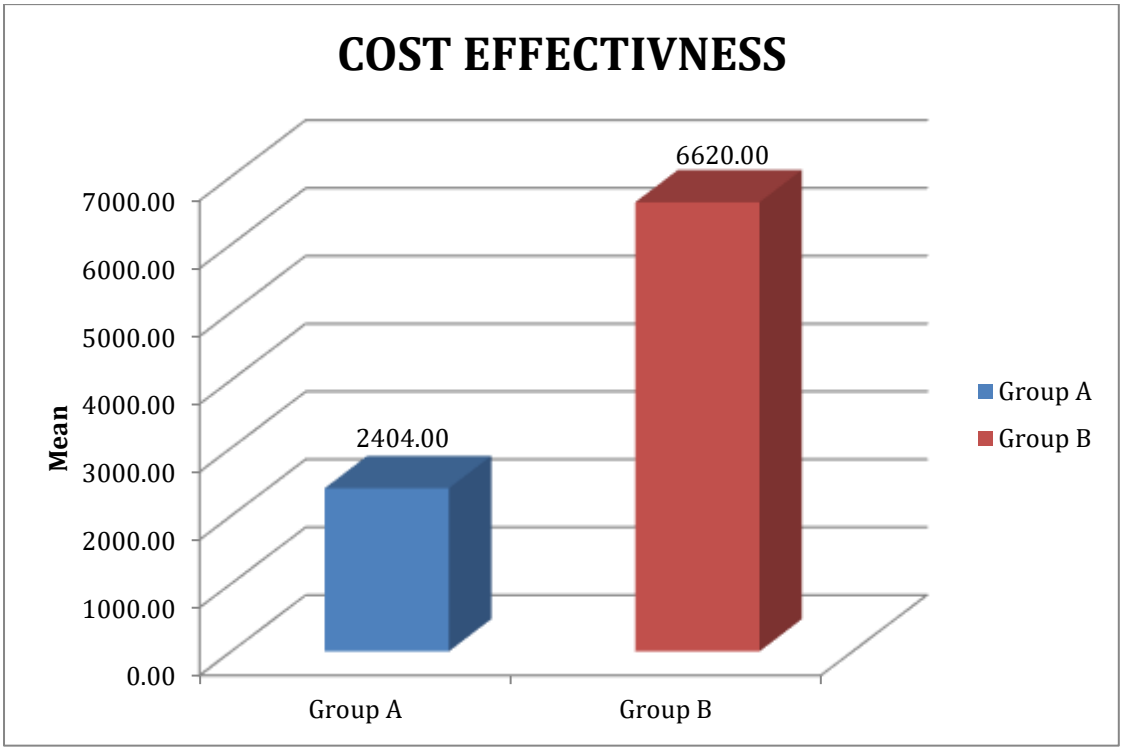

Figure 3: Cost effective ness in between two groups

Table 4 Vas score in between two groups

Table 4 shows that the comparison of means and standard deviations (SD) for several pain-related parameters between the two groups along with the results of a Z-test and its associated p-value. There is a significant difference between VAS score from 6 hours.

	Group A		Group B		Z	p-value
	Mean	SD	Mean	SD		
VAS 6HR	5.78	1.09	2.66	0.94	-8.445	0.001
VAS 24 HR	1.60	0.49	1.34	1.10	-1.398	0.162
VAS 3 DAY	0.80	0.40	0.76	0.89	-1.195	0.232

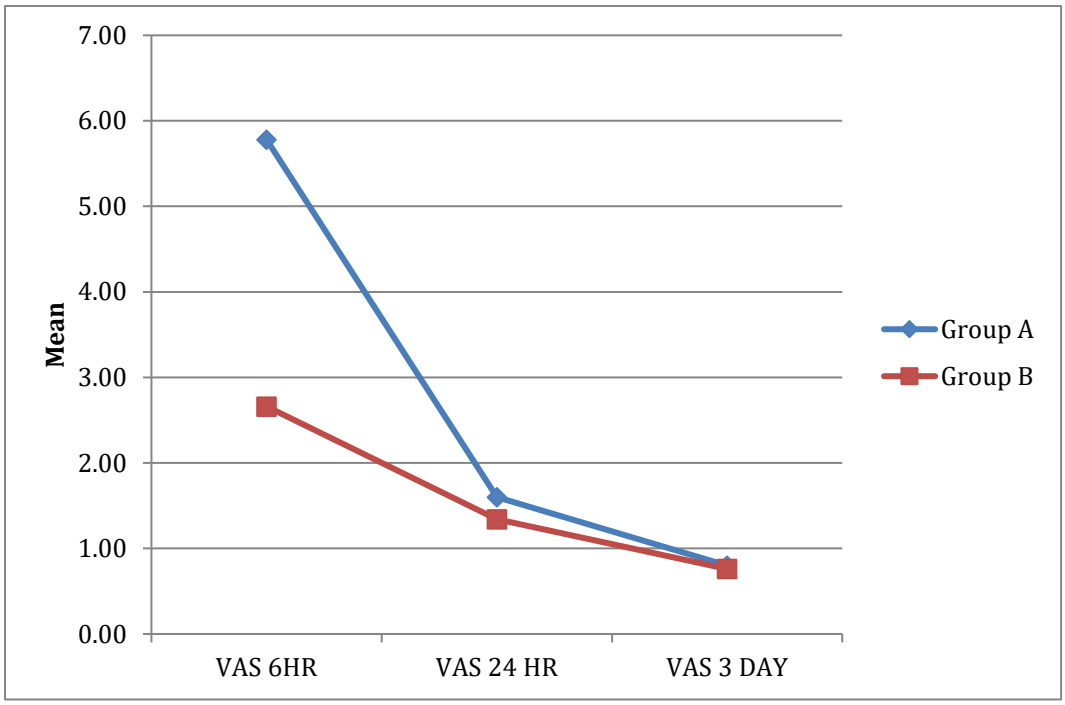

Figure 4: Vas score between two groups

Table 5 Wound Hematoma between two groups

Table 5 shows the distribution of cases between two anesthesia techniques, Nerve Block and Spinal Anesthesia, based on the occurrence of wound hematoma (presence or absence). There is insignificant difference between the two groups

		Nerve Block		Spinal anesthesia		Total	Chi-square value	p-value
		No. of cases	percentage	No. of cases	percentage			
Wound Hematoma	N	47	94.0%	48	96.0%	95	0.211	0.646
	Y	3	6.0%	2	4.0%	5		
Total		50	100.0%	50	100.0%	100		

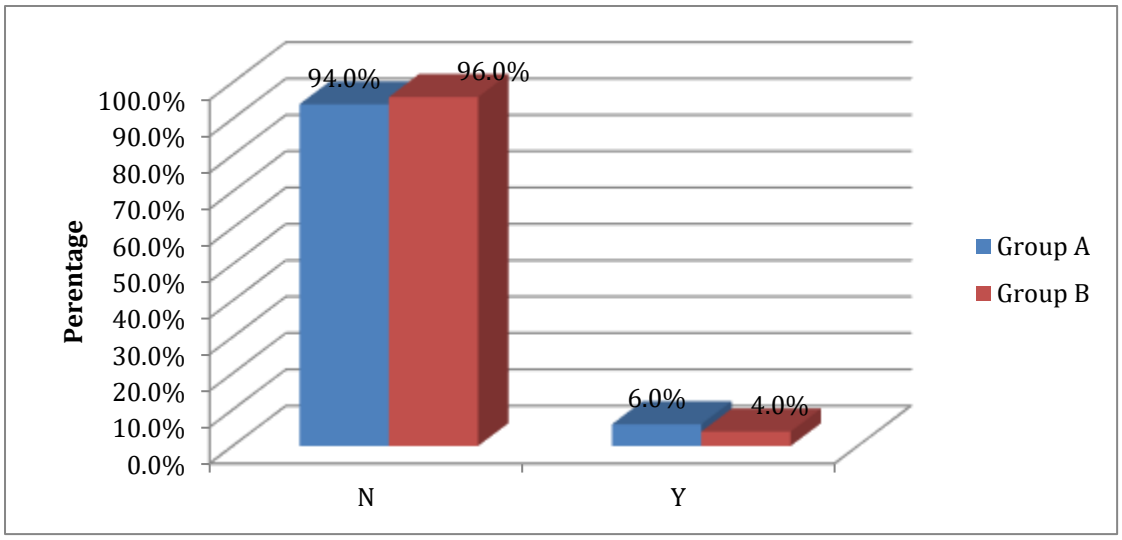

Figure 5 Wound Hematoma in between two groups

Table 6 Distribution of surgical site infection in between the two groups

table 6 displays the distribution of cases between the two anesthesia techniques, Nerve Block and Spinal Anesthesia, based on the occurrence of Surgical Site Infection. On Comparison there is a insignificant difference between the two groups

		Nerve Block		Spinal anesthesia		Total	Chi-square value	p-value
		No. of cases	percentage	No. of cases	percentage			
SSI	N	47	94.0%	47	94.0%	94	0.00	1.00
	Y	3	6.0%	3	6.0%	6		
Total		50	100.0%	50	100.0%	100		

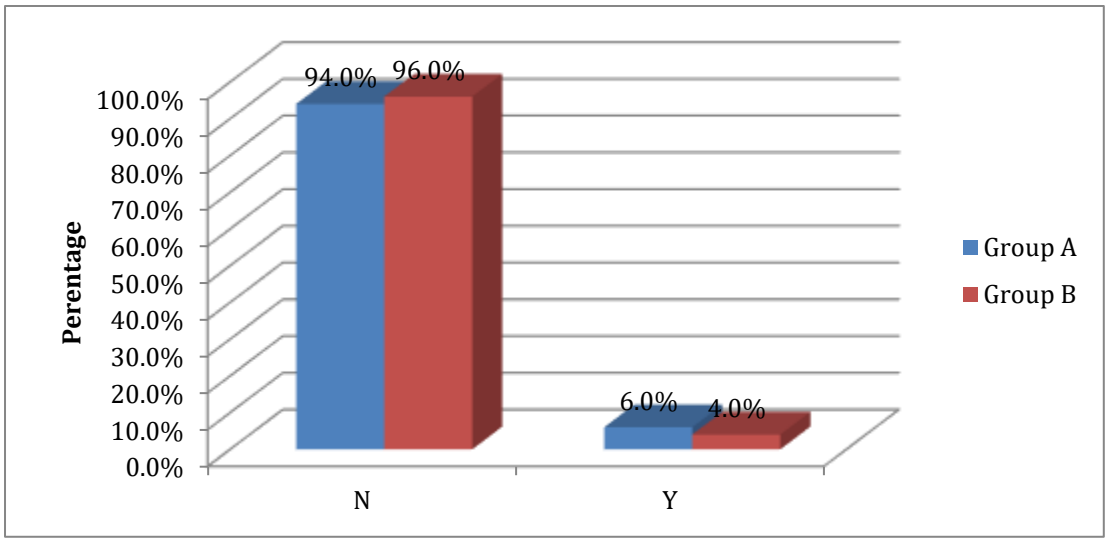

Figure 6 Distribution of surgical site infection between the two groups

Table 7: Presence of Seroma

Table 7 shows the comparison of seroma occurrence between Group A and Group B revealed interesting insights. On Comparison there is a insignificant difference in between the two groups.

		Group A		Group B		Total	Chi-square value	p-value
		No. of cases	Percentage	No. of cases	Percentage			
SEROMA	N	45	90.0%	47	94.0%	92	0.538	0.468
	Y	5	10.0%	3	6.0%	8		
Total		50	100.0%	50	100.0%	100		

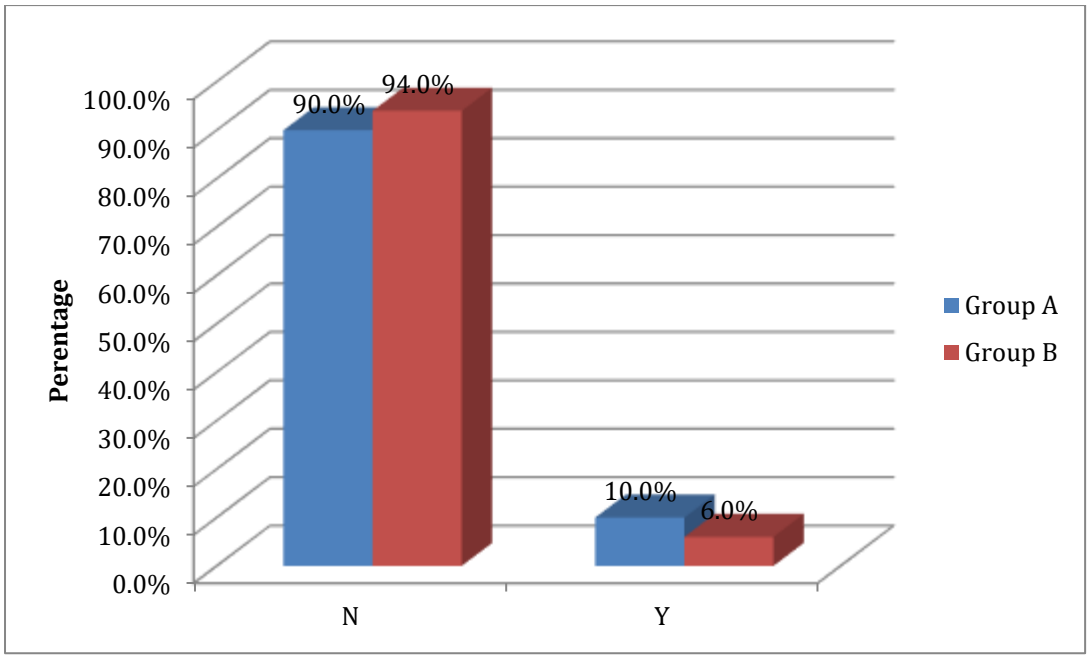

Figure 7 Presence of Seroma

DISCUSSION

What matters most in out-patient surgery is that the patient feels comfortable and can return to their normal routine as soon as possible. In order to minimize unwanted effects, hasten recovery, and assure a favorable outcome, there has been a multitude of studies into procedures, anesthetic medicines, and ideal doses for postoperative pain control after inguinal hernia surgery.[1]

Surgeons have begun to appreciate the Lichtenstein mesh technique for inguinal hernia repair because of its minimal morbidity and recurrence rates. The well-known practicality, affordability, and safety of this surgery are enhanced by these attributes. It has become the gold standard for hernia repairs, to the point that alternative procedures are compared to it.

When inguinal hernia surgeries are done as day care cases by general surgeons, there are a lot of crucial factors utilized to assess whether the repair strategy is successful. Minimizing discomfort after surgery, ensuring cost-effectiveness, and achieving a low risk of hernia recurrence are all part of the plan. These prerequisites are critical for ensuring great results, increasing patient comfort, and making outpatient hernia repair procedures more realistic.[2]

Reducible inguinal hernia treatments may be performed under local anesthesia in adults. There is little risk of problems after anesthesia in this fast, easy, and inexpensive procedure.[3,4] Hospital stay, postoperative pain, recovery time, recurrence rate, and cost-effectiveness were among the outcomes of hernia surgery that Amid et al.[5] discovered to be significantly affected by the utilization of tension-free mesh repair in conjunction with local anesthetic and light sedation. Furthermore, as shown by RN

van Veen et al.[6], local anesthesia has some advantages over spinal anesthesia. The benefits included easing mobilization, shortening recovery time, reducing surgical pain, improving intraoperative analgesia, allowing patients to return to their regular activities sooner, and increasing patient satisfaction. Patients report a significant improvement in their quality of life after local anesthetic Lichtenstein tension-free inguinal hernia repair.[7]

Sensation is sent to the inguinal region—which encompasses the spermatic cord, the inguinal canal, and the surrounding soft tissues—through the genitofemoral, iliohypogastric, and ilioinguinal nerves.[8] The ilioinguinal nerve and the spermatic cord both utilize the external inguinal ring.[8] One branch of the genitofemoral nerve (L1,2) innervates the inguinal cord and structures in the anterior scrotum, whereas the other branch supplies the skin and subcutaneous tissues of the femoral triangle. Restricting sensation to these and neighboring nerves that provide overlapping sensory supplies is the goal of the inguinal regional block. Because of the local anesthetic, the skin around the incision will be numb. Furthermore, it alleviates discomfort in the parietal peritoneum around the hernia and, in particular, the very sensitive neck of the sac. In addition, administering local anesthetic before making the incision lengthens the time that patients need to take pain medication after surgery. Theoretically, local infiltration is superior to other methods for managing postoperative pain because it stops the buildup of local nociceptive molecules

The purpose of this study is to compare spinal blocks to nerve blocks. The Procedure for the anesthetized repair of inguinal hernias with Lichtenstein tension free mesh.

In hernioplasty found that intraoperative pain was greater in the Local anesthesia group compared to the Spinal anesthesia group. This is due to the fact that patients

may encounter discomfort throughout the treatment when dissecting a big hernia under local anesthetic becomes difficult due to adhesions in the sac.[7]

Reyes LA et al. found that only five patients (9.8% of the total) in the Los Angeles group reported any discomfort at all three days after surgery (defined as a VAS score below 2 for pain).[9] On the seventh day after surgery, almost all patients in the LA group (98%) reported no pain, as evaluated by VAS values of 0. This study shows that local anesthetic is superior to other techniques for treating postoperative pain.[9]

Our findings, along with those of Song et al. and Amid et al., demonstrated that the main rationale for transitioning from local anesthetic to general anesthesia during hernia sac relocation or dissection was pain.[9,10]

In this study, compared to the LA group, participants reported somewhat reduced pain on the visual analog scale (VAS) at 12,24, and 48 hours after surgery. Consistent with earlier work by Song et al.[10], we observed that patients undergoing local anesthetic surgery had lower VAS ratings compared to those undergoing spinal anesthesia.[11]

Patients who underwent a local anesthetic reported much less discomfort while moving about six hours after surgery, according to O'Dwyer et al.[12]

There remains space for improvement in the management of intraoperative pain, however Callesen et al. did find that LA is a safe alternative to conventional anesthetic methods with an adequate degree of satisfaction.[13]

In this research, the average operating time for group A was 69.50 minutes, whereas for group B it was 37.70 minutes. Reyes Procedures performed under spinal anesthesia took no more time than those performed under local anesthesia, according to research by LA et al. [14] The time it took to fix inguinal hernias was not substantially different between surgical experts and surgical trainees, according to a new Finnish

paper that included a ten-year audit of Lichtenstein hernioplasty under local anesthesia.[14] The group that received the procedure with a local anesthetic had a much shorter total operating time, as reported by Van Veen et al.[15].

The only major adverse effect seen in this experiment was urinary retention, which affected four participants in the SA group but none in the LA group. In a study conducted by Van Veen et al., it was shown that spinal anesthesia significantly increased the risk of urine retention compared to local anesthesia.[16] Ozgun et al. also came to the same result in their research.[16]

Compared to patients in the Spinal anesthesia group, individuals in the Local Anesthesia group were able to move about after surgery more promptly after anesthesia recovery. According to Van Veen et al. [15], there were no notable differences in the two groups' post-operative ambulation.

We found no difference in the amount of time patients stayed in the hospital after surgery between the two groups.[17] This is due to the fact that what determines a patient's hospital stay—rather than their choice of anesthesia—are social factors.

While choosing an anesthetic and a surgical strategy, it is essential to keep problems to a minimum. Our investigation found that two individuals in each group had skin infections. The mesh-related infection rate was undetected.[18]

The available research suggests that Local Anesthesia treatments with infiltration and peripheral blocks provide more pain relief, less morbidity, fewer instances of urine retention, and increased cost-effectiveness. [18] General anesthesia (GA) is preferred over neuraxial anesthesia when these procedures are not possible. Patients undergoing outpatient surgery may be unable to be released because to the risks of urine retention and ambulation delay associated with Spinal anesthesia, despite the

fact that Spinal Anesthesia offers excellent postoperative anesthesia and pain control.[18] In this study, patients in both groups did not have retention of urine.

There were no cases of hernia recurrence, mesh-related problems, or deep venous thrombosis in any of the patients. Franklin went on to say that during the follow-up period, there had been zero mesh-related problems.[8]

There is no mortality rate for Lichtenstein's hernioplasty done under local anesthetic, although the procedure is long and painful. Nonetheless, it is safe, easy, effective, and affordable. This was caused by a case selection of hernias that lasted for a long time.

Local anesthetic (LA) has less hazards than other forms of anesthesia, which means it might be a better choice for people who have cardiac or pulmonary problems. Surgeons may use the patient's cough to detect small sacs or sliding hernias during surgeries performed with LA since it does not paralyze the abdominal muscles. Since there is no drowsiness or sedation after the operation, early ambulation is feasible, and large recuperation facilities are not necessary.[19,20,

CONCLUSION

In Conclusion, during the follow-up period, there was a significant difference in the Visual Analog Scale (VAS) scores between the two groups. Our research led us to the conclusion that all patients suffering from primary inguinal hernia would benefit from having the Lichtenstein mesh repaired under local anesthesia. A postoperative course with easily controlled pain, quick resumption of unrestricted activities, high levels of patient satisfaction, and simplicity, reliability, effectiveness, and safety are all part of it.

Fig: Infiltrating local anesthesia

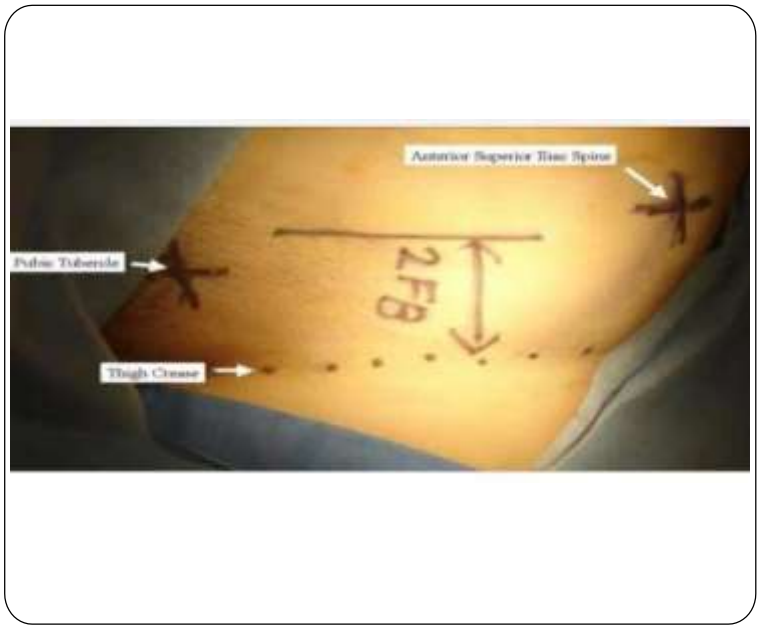

Fig: incision for hernia operation

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