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Comparison of incidence of inguinodynia in open versus laproscopic hernia repair: A prospective cross sectional study

Dr Dhiraj Bhambhani
People's College of Medical Sciences and University, Bhopal
Email: dhirajbhambhani99@gmail.com

Dr Suresh Bhambhani
Associate Professor, Chirayu Medical College, Bhopal
Email: dr.s.bhambhani@gmail.com

Dr Ashok Mhaske
Medical director and Professor, Department of Surgery, Peoples College of Medical Sciences and Research Centre,
Email: shubhashok2@gmail.com

***Abstract*---**Background: A global average of twenty million inguinal hernia surgeries are accomplished each year, making it one of the most common general surgical procedures. In recent years, inguinodynia, also known as post-inguinal pain syndrome, has become more significant. Aim: To carry out comparison of incidence of inguinodynia in open and laproscopic hernia repair. Methods and Materials: There were 200 cases altogether in the study group, of which 100 study participants (category A) underwent open Lichtenstein inguinal hernia mesh surgery and 100 cases (group B) underwent inguinal hernia surgery by laproscopy. Pain intensity was measured using a visual analogue scale (VAS; range: 0 to 10). According to the VAS, inguinodynia patients were divided into three categories: mild category (score 1 to 3), moderate category (4 to 7) and severe category (8 to10). Results: Overall the incidence of inguinodynia was 23.24% in all patients. The incidence of inguinodynia in patients operated for open inguinal hernia repair was 25.96% while the incidence was 18.23% in laparoscopic method of hernia repair. 192 patients were males and 8 were females. With regard to the methodology, there was no discernible variation in the distribution of VAS scores at the first week, third month, and sixth month. However, the values in the open method were a little bit greater. Conclusion: In this study there was no statistically significant difference between the frequencies of inguinodynia with regard to the inguinal hernia repair

method utilised in the current study, however there were somewhat more episodes of inguinodynia with the open method.

***Keywords*---**Inguinodynia, open hernia repair, laproscopy repair

Introduction

A global average of twenty million inguinal hernia surgeries are accomplished each year, making it among the most common general surgical treatment.Generally open repair approach or laparoscopy approach is used to treat the hernia. Transabdominal preperitoneal procedure considered as TAPP and completely extraperitoneal procedure considered as TEP are the two most used laparoscopic methods for inguinal surgery.[1,2] Post-operative chronic pain syndrome of hernia represented in the form of inguinodynia can be brought on by a number of factors, such as shrinkage of mesh, inflammatory reaction, scarring, and type of surgery. Inguinodynia has been described as condition of persistent pain for more than three months following surgery of inguinal hernia.[3,4]

Neuropathic pain and non-neuropathic pain which may be inflammatory in nature or nociceptive in nature are two general categories for inguinodynia. Inguinal nerves may be directly injured during surgery or may be entraped as a result of the inserted mesh, causing neuropathic postherniorrhaphy discomfort. Sharp, searing, or "shooting" pain that progresses with repeated stimulation is the main clinical feature of neuropathic pain.[5,6] A common symptom of inguinal nerve involvement is inguinal paraesthesia condition or tingling sensation, crawling sensation, or electrical sensations, as well as dysaesthesia, which is a sudden or provoked unpleasant aberrant sensation. Although laparoscopy is not any more effective than open surgery at preventing relapse or chronic pain, individuals do experience reduced postoperative pain and fewer superficial wounds.[7] This study compared the occurrence of inguinodynia between the open and laparoscopic inguinal hernia surgery techniques.

Materials & Methods

The study's target population consisted of patients who underwent inguinal hernia surgery at a tertiary level hospital during the study period and met the inclusion crtiteria and exclusion criteria listed below.
There were 200 cases altogether in the study group, of which 100 study participants (category A) underwent open Lichtenstein inguinal hernia mesh surgery and 100 cases (group B) underwent inguinal hernia surgery by laproscopy.

Calculation of size of sample and method of sampling

By taking into account the incidence of score through visual analogue system in the open surgery group which was 23.6 percent and laproscopic group which was 16.4percent, estimated using a small study of forty patients, we determined a representative sample of 220 participants. To allocate the patients into two categories we used random based sampling technique. We investigated 200 study

participants in total, with 100 study participants in each category, after taking into account inclusion and exclusion of study participants.

Inclusion criteria
Patients who underwent inguinal hernia operation during the study's time period after being clinically diagnosed with an inguinal hernia
Age between 18 to 80 years.

Exclusion criteria
Inguinal hernias on both sides. (to prevent bias)
Inguinal hernia that recurs.
Inguinal hernia with complications (obstructed variant,strangulated variant, incarcerated variant).
Individuals who experience inguinal discomfort before surgery.
Uncooperative patients.
Patients having psychiatry problems.

Detailed study protocol

Based on the aforementioned inclusion criteria and exclusion criteria, patients were chosen. For each patient, a case record worksheet was created. The study included all individuals who underwent elective inguinal hernia surgery at tertiary level hospitals. On the seventh post-operative day, patients were examined in the OPD. They were also evaluated at the conclusion of the third, sixth, and 12-month post-operative months if possible. Patients who experienced discomfort in the inguinal region for longer than three months following surgery for repair of inguinal hernia were considered to more susceptible to have inguinodynia and underwent additional testing.

All hernia cases underwent routine post-operative follow-up evaluations on the seventh postoperative day in the OPD. Patients who complained of pain in the inguinal region or discomfort or latency in resuming normal activities were given additional follow-ups predicated on telephonic or email conversations as part of the study's follow-up questionnaire. This survey measured patient satisfaction regarding the operation's outcomes. Every patient was questioned about if they ever experienced pain in the groin area, scrotum, thigh, or at the location of the procedure of hernia repair. Men were also questioned about whether or not the same side of their testicles hurt. People who experienced pain were required to rate it according to how intense it was.

Patients were also questioned regarding numbness in the leg and groin area on the side where hernia surgery took place. They were questioned regarding the nature of their pain, how it affected daily activities, mood, walking capacity, regular employment, interpersonal relationships, sleep, and enjoyment of life. Individuals were called into the OPD for exams when they complained of pain or discomfort. All of these patients had thorough history-taking, which included a look at their pain history, including its origin, progression, severity, and nature. Pain intensity was measured using a visual analogue scale (VAS; range: 0-10). According to the VAS, inguinodynia patients were divided into three categories:

mild category (score 1 to 3), moderate category (4 to 7) and severe category (8 to10).

The terms used to describe the patient's pain were utilised to categorise it as either visceral pain, dull pain, aching pain, or neuropathic pain (sharp pain, searing, spreading pain with numbness, the sensation of piercing of pins and needles). Patients were also questioned about any chronic pain issues they might have, such as irritable bowel syndrome, chronic headaches, or chronic backaches. The patient was questioned about their current pharmaceutical regimen.

The history taking was followed by a thorough clinical examination. The inguinal region was examined locally as part of the physical examination to check for any localised oedema, scars, neuropathy, etc. To rule out systemic disorders aggravating the pain, a systemic examination was also conducted. Inguinal hernia recurrence was also checked on the patients. Also for other issues like hematoma, which did not include bruising and only included haematoma and ecchymosis present at the wound site of hernia surgery. Fluid aggregates were part of the seroma at the site of surgery. Pus from the incision, fistula, and sinus development were all considered to be signs of wound or superficial infection. The period of time from the day of operation till hospital discharge was referred to as the duration of hospital stay. The number of days needed to resume regular social activities was used to indicate the time to get back to ordinary activities. Patients were also questioned regarding the type of pain management they required (non pharmacological management, pharmacological management, interventional mangement, surgical management)

Statistical Analysis

The analysis of all data was carried out with the help of statistical tests like independent sample t-tests, binary logistic regression and chi-square test. A convergence difficulty developed when we attempted to use a binomial regression analysis to compare the incidence of inguinodynia in open and laproscopic hernia repair.To calculate the values pertaining to overall RRs i.e risk ratios and their 95 CIs i.e confidence intervals, a simplified Poisson regression method was established. All analyses were carried out by applying Stata software version 14.

Results

Total 200 patients were included in the study. 100 patients were operated through open methods while another 100 patients were operated by laproscopic method. Overall the incidence of inguinodynia was 23.24% in all patients. The incidence of inguinodynia in patients operated for open inguinal hernia was 25.96% while the incidence was 18.23% in laparoscopic method of hernia repair. 192 patients were males and 8 were females.

In terms of age, 114 of the patients were between the ages of 60 and 79, followed by 70 patients between the ages of 40 and 59, and just 16 patients between the ages of 20 and 39. Regarding the patients' age and gender, inguinodynia did not significantly correlate with either. (Table 1,2). Although the frequency of

inguinodynia was higher with the open approach, there was no statistically significant correlation between the two. (Table 3). There was no conclusive link between the approach utilised and the occurrence of complications. However, the open method had a little bit more complexities.(Table 4).

There was no discernible link between the type of discomfort and the healing technique. However, the open technique had more painful episodes. (Table 5) With regard to the methodology, there was no discernible variation in the distribution of VAS scores at the first week, third month, and sixth month. However, the values in the open method were a little bit greater. (Table 6).

Table-1: Details regarding age of patients included in category A and category B

Method used	Number of patients examined	Age of study participants (years)	
		Mean values	SD values
Open approach	100	66.71	13.21
Laparoscopy approach	100	56.27	14.02

Table-2: Details of gender with respect to approach of repair used

Gender	Method used		Total
	Open approach	Laparoscopy approach	
Male	98	94	192
Female	2	6	8
Total	100	100	200

Table-3: Details regarding incidence of Inguinodynia i.e overall VAS score in category A and Category B

Method used	Overall Visual analogue score				Total	P-value
	Nil	Mild	Moderate	Severe		
Open approach	80	12	6	2	100	0.769
Laproscopy approach	86	10	4	0	100	
Total	166	22	10	2	200	

Table-4: Details regarding correlation between occurrence of complications and method of hernia repair used

Method used	Complication observed		Total values	P-value obtained
	Yes	No		
Open (Lichtenstein) Method	18	82	100	0.123
Laparoscopy Method	6	94	100	
Total	24	176	200	

Table-5: Association between type of pain and method of hernia repair used

Method employed	Nature of pain observed			Total values	P-value obtained
	NP	NC	Mixed		
Open (Lichtenstein) method	28	12	6	46	0.826
Laparoscopy method	26	8	6	40	
Total values	54	20	12	86	

Table-6: Comparison between Open repair and Laparoscopic repair with respect to incidence of pain at different time positions

Time duration	Method employed	VAS				Total	P-value
		Nil condition	Mild condition	Moderate condition	Severe condition		
First week time interval	Open method	54	34	12	0	100	0.228
	Laparoscopy method	68	30	2	0	100	
Third month time interval	Open method	80	12	8	0	100	0.842
	Laparoscopy method	86	10	4	0	100	
Sixth month	Open method	88	8	2	2	100	0.826
	Laparoscopy method	94	4	2	0	100	

Discussion

In recent years, inguinodynia, also known as post-inguinal pain syndrome, has become more significant.It is due to the drop in the recurrence rate following inguinal hernia repairs that surgeons' focus has been directed toward this phenomenon of inguinodynia, which is one of the crucial criteria that determines the outcome of operational treatment for inguinal hernias. It can also be used to compare the effectiveness of various inguinal hernia repair techniques. It is extremely difficult to determine the exact incidence of inguinodynia because pain is a perceptual criterion. Inguinal hernia surgery has hitherto relied on Lichtenstein's tension-free mesh repair as the gold standard. In recent years, inguinal hernia repair by laproscopy has become more common.[8] Thus, we have sought to evaluate the prevalence of inguinodynia following these two techniques for treating inguinal hernias.

200 patients were enrolled in the trial. One hundred patients underwent open surgery, and one hundred more underwent laparoscopic surgery. Inguinodynia affected 23.24 per cent of all patients overall. Inguinodynia occurred in 25.96% of patients who had open inguinal hernia surgery compared to 18.23% of patients who underwent laparoscopic hernia repair. There were 192 male patients and 8 female patients.Age-wise, there were only 16 patients here between ages of 20 and 39, 114 between the ages of 60 and 79, 70 between the ages of 40 and 59, and 114 between the ages of 40 and 79.

Inguinodynia did not substantially correspond with either the patients' age or gender. Despite the open technique having a higher incidence of inguinodynia, there was no statistically meaningful relationship between the two. No concrete connection could be seen between the strategy used and the occurrence of problems. The open approach, however, involved a little bit more complexity. There was no obvious connection between the discomfort's nature and the treatment method. The open approach, however, had more agonising incidents. Regarding the technique, the distribution of VAS scores at the first week, third month, and sixth month showed no appreciable statitistical variance. However the values in the open technique, however, were slightly greater.

According to Grant et al, 2 to 5 per cent of patients experienced severe, incapacitating pain. In their follow-up study from 2003, Poobalan et al. found that 10% of patients reported having moderate pain. Younger patients (18–40 years) presented with inguinodynia more frequently than middle-aged patients (40–60 years) and elderly patients (>60 years), according to Langeveld et al.[9,10] Female sex has been identified as an independent potential risk factor of inguinodynia by Bay - Nielsen M et al. This may be because of the fact that women report their discomfort more frequently and have lower pain thresholds.[11,12] In our study, there were fewer female patients, which could account for the decreased prevalence of pain in females. True associations can only be discovered with larger sample sizes.

Conclusion

In this study there was no statistically significant difference between the frequencies of inguinodynia with regard to the inguinal hernia repair method utilised in the current study, however there were somewhat more episodes of inguinodynia with the open method.

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