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Original Research Article

A Comparative Study of the Incidence of Inguinodynia after Open and Laparoscopic Inguinal Hernia Mesh Repair at a Tertiary Centre in the Eastern Region of India

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Conflict of interest: Nil

Abstract

Background: Inguinal hernia repair is one of the most frequently performed procedures in general surgery, with approximately 20 million repairs every year worldwide. Either open surgery or minimal access laparoscopy is used to repair the hernia. The most common laparoscopic techniques for inguinal repair are transabdominal preperitoneal (TAPP) repair and totally extraperitoneal (TEP) repair.

Aims and Objective: To compare the incidence of inguinodynia in both methods of inguinal hernia repair, Lichtenstein's and the laparoscopic method.

Materials and Methods: The present prospective and observational study comprised 100 patients who were operated on for inguinal hernia repair, which included 50 cases of open inguinal hernia mesh repair and 50 cases of laparoscopic inguinal hernia repair of both genders. All patients with an elective inguinal hernia repair were carried out over a two-year period, from July 2018 to June 2020, at the Department of Surgery, All India Institute of Medical Science, Patna, Bihar (India), and the Department of Surgery, Katihar Medical College and Hospital, Katihar, Bihar (India), after receiving approval from the institutional ethical committee and permission from the heads of the departments. Consent was taken from all enrolled patients. The scores for pain were evaluated using a Visual Analogue Scale (VAS).

Results: There was no statistically significant difference between the incidence of inguinodynia after open Lichtenstein's and laparoscopic repairs of inguinal hernia. No statistically significant difference was observed in the incidence of inguinodynia in the two groups with respect to age, gender, duration, and complications. There was no difference in the incidence of inguinodynia after open Lichtenstein's and laparoscopic repairs of inguinal hernia.

Conclusion: In the present study of inguinal hernia repair, there was no difference observed between the incidences of inguinodynia with respect to the method of inguinal hernia repair used; open Lichtenstein's repair and laparoscopic repair.

Keywords: Inguinal hernia, Repair, Laparoscopic, Open, Inguinodynia, Visual analogue score.

Introduction

Inguinal hernia repair is one of the most frequently performed procedures in general surgery, with approximately 20 million repairs every year worldwide [1]. Either open surgery or minimal access laparoscopy is used to repair the hernia. The most common laparoscopic techniques for inguinal repair are transabdominal preperitoneal (TAPP) repair and totally extraperitoneal (TEP) repair [2]. Hernia postoperative chronic pain syndrome known as inguinodynia can be brought on by a number of factors, including mesh shrinking, inflammation, scarring, and surgical technique. Chronic postoperative inguinal pain (post-hernio rrhaphy inguinodynia or CPIP) is defined by the International Association for the Study of Pain as "pain beyond three months after inguinal hernia surgery" [3]. CPIP is generally classified as neuropathic and non-neuropathic (inflammatory or nociceptive) pain. Neuropathic post-herni orrhaphy pain can be a result of nerve entrapment by the inserted mesh or direct damage to inguinal nerves during surgery [4]. Sharp, burning, or "shooting" pain that progresses with repeated stimulation is the main clinical feature of neuropathic pain. "Tingling", "crawling", or electrical sensations) and dysaesthesia (spontaneous or evoked unpleasant abnormal sensations) with radiation towards the associated skin area of the involved inguinal nerve are often reported. On the other hand, laparoscopy, on the other hand, is no better than open surgery at reducing recurrence or chronic pain, albeit with less pain and superficial wounds [5]. Chronic pain after prosthetic inguinal hernia repair is considered to be one of the unsolved problems after prosthetic inguinal hernia repair [6,7]. Its incidence is referred to as being from 0.03 to 31% in the scientific literature [8,9].

Aims and Objective: The present study was carried out with the aim of comparing the incidence of inguinodynia in both methods of inguinal hernia repair; open Lichtenstein's and the laparoscopic method.

Materials & Methods

The present prospective and observational study comprised 100 patients who were operated for inguinal hernia repair, which included 50 patients (group A) of open inguinal hernia mesh (Lichtenstien) repair and 50 patients (group B) of laparoscopic inguinal hernia repair of both genders. All patients with an elective inguinal hernia repair were carried out over a two-year period, from July 2018 to June 2020, at the Department of Surgery, All India Institute of Medical Science, Patna, Bihar (India), and the Department of Surgery, Katihar Medical College and Hospital, Katihar, Bihar (India), after receiving approval from the institutional ethical committee and permission from the heads of the departments. Consent was taken from all enrolled patients. Data such as name, age, gender, etc. was recorded. By considering the occurrence of visual analogue score (VAS) or pain in the open Lichteinstein's group of 24% and the laparoscopic group of 5.4%, calculated by using a pilot study of 20 patients, we have used the simple random method to divide the patients into two groups. By considering inclusion, exclusion, and loss of follow-up, we have examined a total of 100 patients, with 50 patients in each group. Patients were selected on the basis of the inclusion and exclusion criteria below:

Inclusion criteria

Patients who were clinically diagnosed to have inguinal hernia and who had undergone inguinal hernia repair during the time period of this study were aged >20 but < 70 yrs.

Exclusion criteria

a. Bilateral inguinal (to avoid bias)
b. Psychiatric patients
c. Patients who have a preoperative inguinal region pain
d. Recurrent inguinal
e. Complicated inguinal hernia (obstructed, strangled, incarcerated).
f. Non-compliant
g. Patients suffering from other pain syndromes and chronic disorders like spine traumas, diagnosed neuropathies, collagen vascular disease, chronic renal failure, bleeding disorders, and immune compromised status

Patients were evaluated at the end of the 1st week of postoperative day in OPD and also at the end of the 3rd and 6th postoperative months. Patients with inguinal region pain for more than 3 months after elective inguinal hernia repair were considered to have inguinodynia and were further evaluated. At the end of the first week of post-operative day evaluation in OPD was included as routine post-operative follow up for all hernia cases, while further follow ups were done for patients who had complaints of inguinal region pain or discomfort or delayed resumption of routine activities, based on telephonic or email conversation as part of the follow up questionnaire designed for the study. This questionnaire evaluated the outcome and satisfaction with the surgical procedure. All patients were asked if they had pain in their groin/scrotal/thigh region or at the site of the hernia repair at any point. In addition, men were asked if they had pain in their testicles on the same side. People who experienced pain were asked to grade it according to how severe it was. Patients were also asked about numbness around the groyne and in the thigh on the side of the hernia operation. They were asked about the character of their pain, the effect of pain on general activities, mood, walking ability, normal work, personal relations, sleep, and enjoyment of life. Patients complaining of pain or discomfort were called to the OPD for examinations. All of these patients had thorough history-taking, which included a history of their pain, including its onset, duration, progression, severity, and type. A visual analogue scale (VAS 0-10) was used to assess the severity of pain Patients with inguinodynia were classified according to VAS into mild (score 1-3), moderate (4-7) and severe (8-10). The words used to characterise the patient's pain were used to classify the pain into neuropathic (sharp, shooting and radiating pain or numbness/pins and needle sensation) and nociceptive (dull, aching or irritating) pain or visceral. Additionally, participants were questioned about their history of other chronic pain conditions, such as headaches, backaches, irritable bowel syndrome, or any other chronic pain-related conditions. The patient was asked if they were on any medications. The history-taking was followed by a thorough clinical examination. Physical examination included local examination of the inguinal region to look for local swelling, scarring, neuropathy, etc. A systemic examination was also done to rule out systemic diseases complicating the pain. Inguinal hernia recurrence was also examined in the patients. Also, for other complications like hematoma, which include only wound or hernia site hematoma or ecchymosis but not bruising. Seroma included fluid collections at the hernia site. A wound or superficial infection was defined as a wound related to infection only and included pus from the wound, fistula, and sinus formation. The length of hospital stay was measured in terms of time. from the day of surgery to discharge from the hospital. Time to return to usual activities was defined as the number of days required to resume normal social activities. Patients were also inquired about the requirements of the treatment they needed for the pain (non-pharmacological, pharmacological, interventional, surgical).

Statistical Analysis

The data was analysed by the Statistical Package for Social Sciences (SPSS, version 22) and by using Microsoft Excel 16. For inferential statistics, the Chi-square test and Fisher's exact test were used to find the association and significance between two groups with various quantitative parameters like gender, type of hernia, type of pain, severity of pain, occurrence of complications etc. A p value of 0.05 was considered as significant.

Results

A total of 100 patients were included in the study, of which 94 were males and 6were females. The majority of the patients, 57 patients, were in the age group of 55–70, followed by the 40–54 age group, with 35 patients, while only 8 patients belonged to the 20–39 age group.

Table 1: Distribution of patients with respect to age and method of hernia repair

Method	Number of patients	Mean Age (years) ± SD
Open (Lichtenstein)	50	65.20 ± 11.13
Laparoscopy	50	54.16 ± 12.37

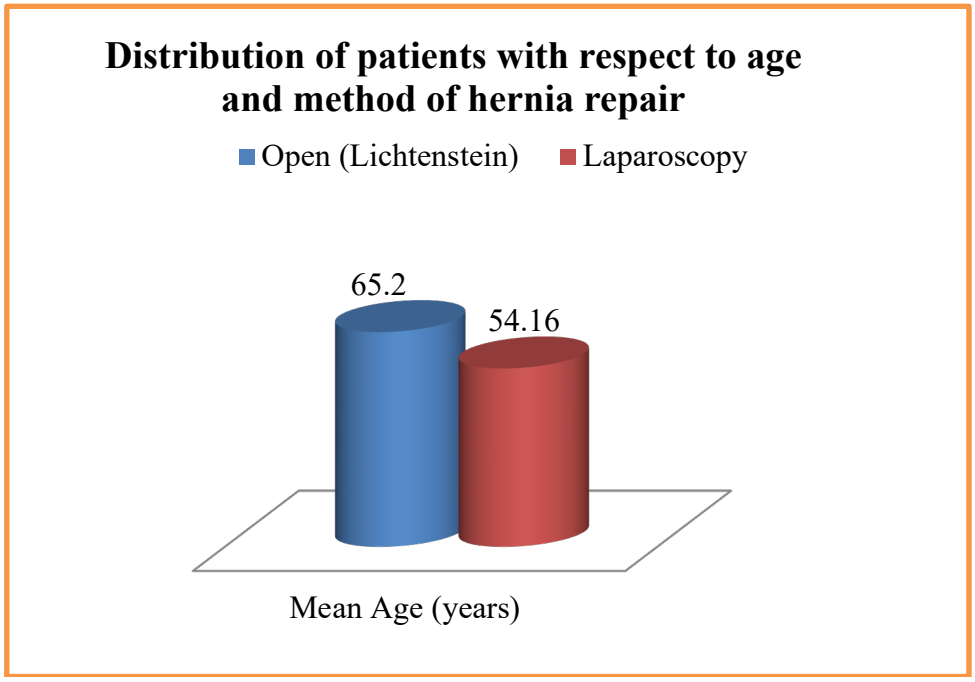

Table 2: The distribution of patients with respect to age and method of hernia repair

Gender	Method		Total
	Open (Lichtenstein)	Laparoscopy	
Male	48	46	94
Female	2	4	06
Total	50	50	100

There is no significant association between inguinodynia with regard to age and gender of the patients.

Table 3: Association between the incidence of inguinodynia (overall VAS score) and the type of repair method used (open and laparoscopic).

Method	Visual analogue score				Total	p value
	Nil	Mild	Moderate	Severe		
Open	38	7	4	1	50	0.68
Laparoscopy	42	6	2	0	50	0.63
Total	80	13	6	1	100	0.65

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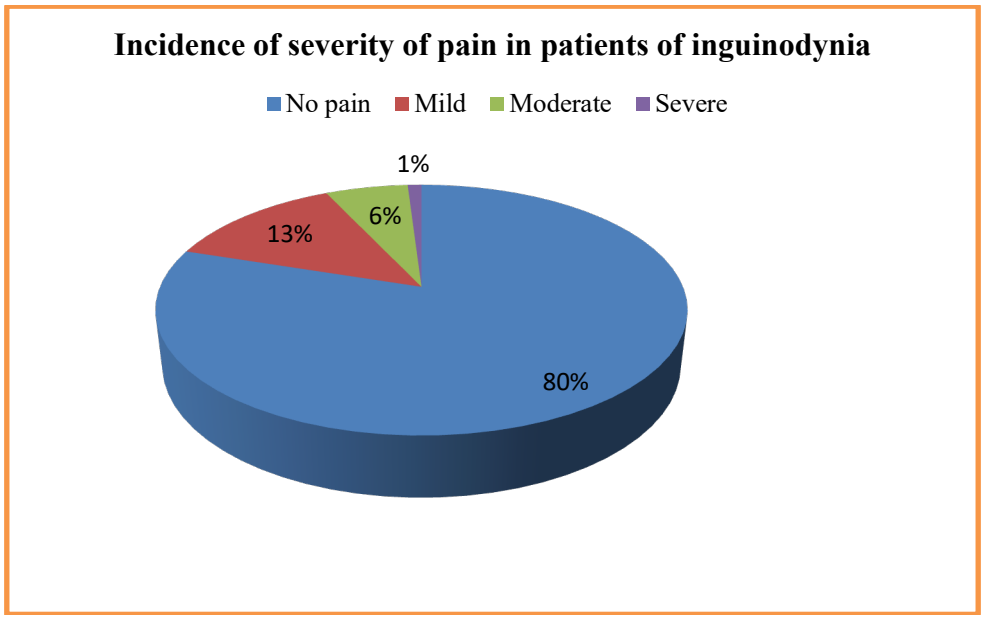

There was no significant association between inguinodynia with respect to the method used, open or laparoscopic.

Table 4: Association between occurrence of complications and method of repair used

Method	Complication		Total	p value
	Yes	No		0.15
Open	10	40	50	0.27
Laparoscopy	4	46	50	0.13
Total	14	86	100	0.36

There was no significant association between the occurrence of complications and the method used.

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

Method	Type of pain			Total	p value
	NC	NP	Mixed		0.45
Open	12	8	3	23	0.37
Laparoscopy	13	4	3	20	0.23
Total	25	12	6	43	0.16

NC=Nociceptive pain, NP=Neuropathic pain

There was no significant association between the type of pain and the method of repair used.

Table 6: Comparison between Open (Lichtenstein's) repair and Laparoscopic repair with respect to incidence of pain

Duration	Method	Visual analogue score				Total	p value
		Nil	Mild	Moderate	Severe		
1st week	Open	26	16	08	0	50	0.12
	Laparoscopy	32	14	4	0	50	0.25
3rd month	Open	42	5	3	0	50	0.11
	Laparoscopy	41	6	3	0	50	0.23
6th month	Open	45	3	1	1	50	0.63
	Laparoscopy	47	2	1	0	50	0.72

There was no significant difference between VAS score distribution (at 1st week, 3rd month and 6 th month) with respect to method used.

Discussion

Inguinodynia, or post-inguinoplasty pain syndrome, is an entity that has gained importance in recent times. It is because of the decline in recurrence rate after inguinal hernia repairs that has shifted attention of surgeons to this entity, which is one of the important factors that decides the success of operative treatment of inguinal hernia. Also, it can be used to determine the superiority of one method of inguinal hernia repair over the other. As pain is a subjective criterion, it is very difficult to assess the true incidence of inguinodynia. Traditionally, Lichtenstein's tension-free mesh repair is considered the standard surgical procedure for the repair of inguinal hernias. Laparoscopic inguinal hernia repair has gained popularity in recent times. We have thus made an attempt to compare the incidence of inguinodynia after these two approaches to inguinal hernia repair. Comparison of incidence of inguinodynia between open and laparoscopic groups at 1st week has p value of 0.12 and 0.25 respectively (not significant) whereas at 3 months has p value of 0.11 and 0.23 respectively (not significant) and at 6 months it was 0.63 and 0.72(not significant). Grant et al reported severe incapacitating pain in 2% to 5% of patients [10]. In 2003, Poobalan et al., in their own follow-up study, identified around 10% of patients who reported having moderate pain [11]. For comparison, 3 age groups of patients were divided. The groups were of age groups between 20 to 39 years, 40 to 54 years, and 55 to 70 years. In a group of less than 40 years of age, only 3 patient had mild postoperative pain out of a total of eight patients. In a group of age between 40 and 59 years, out of a total of 35 patients, 4 had mild pain while 4 had moderate pain. In the age group of 60 to 79 years, 6 patients had mild pain, 2 had moderate pain, and 1 patient had severe pain. The comparison between the incidence of inguinodynia and these age groups showed a p value of 0.65(not significant). This shows there is no association between the age of the patient undergoing hernia surgery and the incidence of inguinodynia. Langeveld et al stated that younger patients (18–40 years) presented more often with CPIP than middle-aged patients (40–60 years) and the elderly (>60 years), 43% vs. 29% vs. 19% [12]. Female sex, according to Bay - Nielsen M et al., is an independent risk factor for the development of inguinodynia. This is possibly because females repor the pain more and also have a lower pain threshold [13]. In our study, the incidence of pain in females was lower, possibly due to the smaller number of female patients. A larger sample size is required to find the true association. [14]

Conclusion

In the present study of inguinal hernia repair, there was no difference observed

between the incidences of inguinodynia with respect to the method of inguinal hernia repair used; open Lichtenstein's repair and laparoscopic repair. Though factors like younger age and female gender have been mentioned in literature to be the risk factors for the development of inguinodynia, in the present study there was no statistically significant association between these two factors and inguinodynia. There was no significant difference in the incidence of complications between open and laparoscopic repairs. There was no association between the occurrence of inguinodynia and the type of hernia and length of stay.

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