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Comparative Study of Preservation versus Division of Ilioinguinal, Iliohypogastric and Genital Nerves during Lichtenstein Hernioplasty

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Abstract

Background: Identification & preservation of all three inguinal nerves (Ilioinguinal nerve (IIN), Iliohypogastric nerve (IHN), Genital branch of Genitofemoral nerve (GFN)) during Lichtenstein hernia repair compared to neurectomy of all nerves in terms of complications like chronic groin pain and altered sensation.

Methods: This comparative study was conducted from the patients admitted with unilateral primary uncomplicated indirect and direct inguinal hernia. The diagnosis of unilateral primary inguinal hernia was made essentially on clinical examination and with appropriate investigations; patients were assessed for fitness for surgery. The study included 100 male patients of age 20-50 years with unilateral primary inguinal hernia divided into two groups (group A and B) of 50 each.

Results: Overall Chronic pain among patients of group A at 1 month, 3 month, and 6 months follow up was seen in 22 (44%), 26(52.00%) and 17 (34.00%) of the patients compared to 35 (70%) ,16 (32.00%)and 3(6.00%) patients of group B implying a significant reduction in incidence of pain with time in nerve resection group. Overall pain assessment scores for groups when compared, showed a statistically significant difference with a mean pain score over 6 months follow up of 2.94±2.67v/s 1.52±1.05 ($p< 0.05$) favoring a reduced pain in nerve resection group. At no point of assessment for complaints of pain during normal daily activities, pain on walking stairs and for pain on prolonged standing any statistically significant difference was found among groups. On comparing incidence of altered sensation, a high incidence was noted at first month (46.00% v/s 30.00%), with gradual decrease in incidence over follow up period, at 3 month (32.00% v/s 20.00%) and at 6 months (20% v/s 10.00%) but the difference was statistically insignificant

Conclusion: A planned resection of the inguinal nerves at the time of hernioplasty is associated with a decrease in the incidence of chronic post-operative groin pain without any significant neurosensory disturbances. Hence neurectomy can be considered as a routine surgical step during Lichtenstein hernia repair

Keywords: Inguinal hernia, Lichtenstein's repair, Chronic inguinodynia, Neurectomy, Ilioinguinal nerve

Introduction

Inguinal hernia repair has long been one of the most common operations performed by general surgeons. Despite the frequency of this procedure, complications continue to challenge surgeons, particularly those of recurrence, infection, testicular atrophy, post-operative pain, and nerve injury. With the recurrence rates decreasing as techniques of prosthetic hernia repair evolve, hernia surgeons have focused their attention on chronic post-herniorrhaphy inguinodynia.[1] with a reported incidence ranging from 19% to 62.9%, chronic groin pain is a significant problem following open inguinal hernia repair.[2]

As the recurrence rate is reduced to less than 5% after mesh repair, nowadays long term morbidity associated with open inguinal hernia repair is mainly related to chronic groin pain. Most recent prospective and population based studies have indicated, up to 6% of patients may have moderate to severe pain one year after surgery.[2] In all, over a third will report some form of pain at one year after operation, but only 2-4% are adversely affected by chronic pain in daily life.[4]

This study was undertaken to assess the feasibility of identification & preservation of all three inguinal nerves-Ilioinguinal nerve (IIN), Iliohypogastric nerve (IHN), Genital branch of Genito femoral nerve (GFN) during Lichtenstein hernia repair compared to neurectomy of all nerves in terms of post-operative chronic groin pain and altered sensation.

Methods

This comparative study was conducted from the patients admitted with unilateral primary uncomplicated indirect and direct inguinal herniae.

The diagnosis of unilateral primary inguinal hernia was made essentially on clinical examination and with appropriate investigations; patients were assessed for fitness for surgery.

Inclusion criteria- The study included 100 male patients of age 20-50 years with unilateral primary inguinal hernia divided into two groups (group A and B) of 50 each.

Exclusion criteria

- Patients aged less than 20 years and more than 50 years.
- Female patients, recurrent hernia, complicated hernia, and patients undergoing other surgical procedures concurrently

Informed consent was obtained before surgery, describing the benefits or problems associated with planned intervention. Under spinal anaesthesia the inguinal hernia was repaired using open tension free mesh repair as described by Lichtenstein et al.[5] similar surgical methodology was followed in both the groups. Nerve preservation was done in group of 50 patients of group A and resection in another 50 patients of Group B, neurectomy specimen was confirmed by histopathological analysis.

Nerve division was done using surgical blade and neither cautery nor suture ligations were used. Prolene mesh of size 6x11cms manufactured by Ethicon was used in the Lichtenstein mesh repair. Polypropylene 2-0 was used to suture the mesh in place. Sutures were removed on post-operative day 7 and patients were discharged if there was no wound related complications.

Subsequently patients were called to outpatient department for follow up at 1, 3 and 6 months post-surgery. Follow up Assessment: Assessment of pain: Assessment for pain was done using Visual analogue scale (VAS).

Results

Table 1: General characteristics

Variable		Nerve Preservation group -A	Nerve Resection group-B	p-value
Mean age		44.21±5.31 yrs	41.36±6.02 yrs	>0.05
Incidence of pain	At 1 month	22(44.00%)	35(70.00%)	<0.05
	At 3 month	26(52.00%)	16(32.00%)	<0.05
	At 6 month	17(34.00%)	3(6.00%)	<0.05
Mean pain score over 6 months		2.94±2.67	1.52±1.05	<0.05
Altered Sensation	At 1 month	23(46.00%)	15(30.00%)	>0.05
	At 3 month	16(32.00%)	10(20.00%)	>0.05
	At 6 month	10(20.00%)	5(10.00%)	>0.05

Overall Chronic pain among patients of group A at 1 month, 3 month, and 6 months follow up was seen in 22 (44%), 26(52.00%) and 17 (34.00%) of the patients compared to 35 (70%) ,16 (32.00%)and 3(6.00%) patients of group B implying a significant reduction in incidence of pain with time in nerve resection group. Overall pain assessment scores for groups when compared, showed a statistically significant difference with a mean pain score over 6 months follow up of 2.94±2.67v/s 1.52±1.05 (p< 0.05) favoring a reduced pain in nerve resection group.

At no point of assessment for complaints of pain during normal daily activities, pain on walking stairs and for pain on prolonged standing any statistically significant difference was found among groups. On comparing incidence of altered sensation, a high incidence was noted at first month (46.00% v/s 30.00%), with gradual decrease in incidence over follow up period, at 3 month (32.00% v/s 20.00%) and at 6 months (20% v/s 10.00%) but the difference was statistically insignificant

Discussion

All inguinal herniae share the common feature of emerging through the myopectineal orifice of Fruchaud, the opening in the lower abdominal wall bounded above by the myoaponeurotic arch of the lower edges of the Internal Oblique and the Transverses Abdominus muscle, and below by the pectineal line of the superior pubic ramus. Inguinal hernia surgeries are one of the most frequently performed operations in general surgery.

Lichtenstein tension-free pre shaped mesh hernioplasty has become a gold standard for hernia repair. The use of open mesh repair is associated with a reduction in recurrence rate of between 50%- 75% compared with open repair without mesh. As the recurrence rate is reduced to less than 5% after mesh repair, nowadays long term morbidity associated with open inguinal hernia repair is mainly related to chronic pain. Chronic post hernioplasty groin pain, defined as pain lasting for more than 3 months after surgery is one of the most important complications occurring after inguinal hernia repair, occurs with a frequency more than previously thought.

The most common types of chronic post-operative pain are of somatic or neuropathic origin. The neuropathic chronic groin pain is one of the most debilitating long term complications, which can significantly affect the patient's satisfaction and quality of life. A proposed mechanism for the development of post- operative chronic groin pain is the inflammation and fibrosis induced by the mesh, which is in close proximity to nerves. In addition unintentional injury or strangulation of the nerves during suturing may also contribute to the phenomenon.

Present study in comparison to other studies showed similar trend of decreasing incidence of altered sensation with time but was not statistically significant between the

groups, inferring that neurectomy is not associated with increased incidence of neurosensory disturbances.[6-8]

Conclusion

A planned resection of the inguinal nerves at the time of inguinal hernia repair is associated with a decrease in the incidence of chronic post-operative pain, without any significant neurosensory disturbances. Carrying out this simple maneuver at the time of operation might decrease a major source of postoperative patient morbidity and thus it can beconsidered as a routine surgical step during herniolasty. Assessing time interval in patients before they resume working and impact on quality of life can be useful and is recommended for future studies.

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