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## Is Routine Ilio Inguinal Neurectomy the Saviour for Post Operative Sexual Dysfunction and Chronic Inguinodynia in Open Inguinal Mesh Hernia Repair

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**Abstract**

**Background:** Chronic inguinal neuralgia and post-operative sexual dysfunction are some of the significant complication following inguinal hernia repair. Routine ilioinguinal neurectomy has been proposed to avoid this complication. The aim of this study was to prospectively compare post-operative sexual function and pain in patients undergoing inguinal hernia surgical repair with or without excision of the ilio-inguinal nerve. Routine ilioinguinal neurectomy has been proposed as a means to avoid this complication.

**Materials and Methods:** About 56 patients with a unilateral inguinal hernia underwent an open tension free repair with mesh implantation ("Lichtenstein" technique). The ilio-inguinal nerve was identified and was either preserved or divided. Patients were asked to answer a pretested standardized questionnaire about their sexual function pre-operatively, 3 months postoperatively and every 6 months afterwards during the follow up and postoperative pain was assessed by visual analogue scale.

**Results:** About 20% of the patients in both groups reported an improvement of their pre-operative sexual disorders. New sexual functional symptoms were reported significantly more in the preservation group compared to the excision group. Six months after surgery the number of patients with functional sexual symptoms was lower in both groups but significantly higher in the preservation group. Groin Pain score was comparatively less during 1 month, when nerve is excised where as there was no statistically significant decrease was seen in groin pain at 6 month between the groups.

**Conclusion:** Although results are nearly similar in both groups, routine ilio inguinal neurectomy has no major complications and reduces the intensity of groin pain and early recovery of sexual functions in the early post-operative periods and reduces the risk of ilio inguinal nerve entrapment under the mesh, sutures, staples and reduces the incidence of chronic inguinodynia.

**Keywords:** Hernia; Hernia; Ilio inguinal Nerve; Neuralgia; Neurectomy; Sexual functions.

**Introduction**

Sexual dysfunction is a significant problem although not thoroughly investigated after inguinal hernia surgery. Postoperative sexual function is an important factor to consider because the operation is performed in the inguinal region, in close proximity to the testicular structures and nerves which are important for sexual function.

Furthermore, modern techniques of hernia repair are based on the implantation of a mesh to reinforce the inguinal floor. Additionally, the presence of a hernia may negatively affect sexual activity due to pain and cosmetic concerns.<sup>1</sup>

The open inguinal hernia surgical repair with mesh implantation is a reliable and comfortable technique, because in contrast to the classical tension techniques it permits an early and stable

physical loading of the patient. Meanwhile local inguinal nerves (ilio-inguinal nerve, iliohypogastric nerve and the genital branch of the genitofemoral nerve) can be either transected intra-operatively, be entrapped by suture material or even be involved in the postoperative scar tissue.<sup>2,3</sup> As a result, patients suffer from chronic groin pain, one of the most debilitating long-term complications after inguinal hernia repair, which can significantly affect the patient satisfaction and quality of life after the operation.<sup>4,5</sup>

Inguinodynia (groin pain > 3 months after hernioplasty) is the second most common complication occurring after inguinal hernia repair with an incidence rates from 0% to >37%.<sup>2</sup> The pain is usually due to post hernioplasty nerve entrapment. These patients usually present with groin pain for varying lengths of time, while most report pain immediately after their inguinal operation. Various groin pain syndromes may develop usually from scar tissue, reaction to prosthetic material, or involvement of a nerve in staples or suture material during repair of the hernia. Postoperative groin pain, or neuralgia, is common to varying degrees following groin hernioplasty. During open hernia repair, the ilioinguinal, iliohypogastric, and the genitofemoral nerves are most injured and cause mesh inguinodynia.<sup>6</sup>

Nerve injury is usually due to entrapment of a portion of the nerve in the mesh or suture line placed in one of the soft tissue.<sup>3</sup> When the conservative approach fails, groin re-exploration can be performed to ligate, or excise affected nerve branches. The concept of routine neurectomy in surgery is not unique to inguinal hernia repairs.<sup>7,8</sup> Routine excision of the ilioinguinal nerve to decrease the incidence of chronic inguinodynia has been proposed yet controversies persist, and the procedure is not widely accepted.<sup>8</sup> Inguinodynia is seen in 21% of the ilio-inguinal nerve preservation group in earlier studies which is a high incidence of postoperative surgical pain. Although many studies have been made on the efficiency of inguinal hernia surgeries with reference to their effects on quality of life, there are only several studies which specifically evaluate postoperative sexual activity & groin pain. There is a need to know the outcome of nerve excision on postoperative groin pain & sexual dysfunction. Hence this study has been taken to compare the postoperative sexual functions and inguinodynia in open mesh hernia repair after ilioinguinal nerve excision or preservation.

## Methodology

A prospective study was done for a period of one and half year during October 2018 to April 2020 in the Department of Urology, Parul Institute of Medical Sciences. The study included patients admitted with inguinal hernia above 18 years of age (undergoing open mesh hernia repair) and excluded those with incarcerated hernia, bilateral hernia, recurrent hernia, comorbidities like Diabetes & Peripheral Neuropathy. About 56 Patients were randomly selected either to control group (Group A- where ilioinguinal nerve is preserved) or study group (Group B - where ilioinguinal nerve is excised) in the operating room. Each study group (Preservation vs. Excision group) included 28 patients. Probable benefits or problems according to nerve preservation or excision were explained and consent was taken from patients. Details of cases were recorded including history, clinical examination, and investigations. Inguinal hernia of patients was repaired using the open tension free mesh technique described by Lichtenstein.

The main outcome criterion of this study was sexual function & inguinodynia after groin hernia surgical repair with or without excision of the ilioinguinal nerve. Post-operatively the patients were asked to answer about their sexual function using a pretested questionnaire by the Institute of Sexual Medicine of the Charité University Hospital. The questionnaire consists of 40 questions about sexual life, experiences and behavior, paying attention to the detection of sexual disorders (potency disorders, orgasm disorders, pain or discomfort during sexual intercourse). Postoperative pain is assessed by visual analogue scale at 1 month, 6month after the surgery.

A standardized documentation of the clinical symptoms and treatment results of each patient was carried out. Patients were observed at pre-operatively & with routine follow-up at 3 months postoperatively and every 6 months afterwards during the observation period.

### Statistical analysis

Chi square test was used compare the proportions. Continuous variables are presented as mean + SD and were compared using the Student's t-test. P < 0.05 was considered as significant. Analysis was performed using SPSS version.<sup>22</sup>

## Results

The study consisted of 56 patients with 28 each in both study and control groups who were prospectively randomised for open mesh repair out of which a male preponderance of inguinal hernia was seen in 54 (96%) and Female incidence was 4 (4%). The average age of our study participants was found to be  $47 \pm 18$  years. Among the patients 45 (80%) had indirect hernia & 11 (20%) had direct inguinal hernia. Both groups were comparable regarding their demographic data and operative findings. There were no intra-operative complications. Complications like seroma, hypoesthesia, pus collection, haematoma, neuralgia-ilio-inguinal neuritis and hernia recurrence were assessed in our study. Seroma was seen in 5 patients (9%) (Excision group: n = 3 ; Preservation group: n = 2;  $p > 0.05$ ). Hypoesthesia was seen in 10 patients (17.8%) (Excision group: n = 8; Preservation group: n = 2;  $p < 0.05$ ) and was statistically significant. The wound healing complications receded spontaneously with no further problems within the first 3 postoperative months, while the neuritis persisted partially in 8 patients (11%) (Excision group: n = 2; Preservation group: n = 8). No haematoma, No pus collection and no hernial recurrence were seen in any patients in either group when followed upto 6 months.

Groin Pain score was comparatively less during 1 month, when nerve is excised where as there was no statistically significant decrease was seen in groin pain at 6 month between the ilio inguinal nerve excised and preserved group (Table 1, Fig 2).

Thirty-three patients (excision group: n = 17; preservation group: n = 15;  $p < 0.05$ ) reported pre-operative sexual dysfunction related to the symptoms of the groin hernia which was found to be statistically significant. These complaints had an equally negative influence on potency, erection and orgasm. Three months after surgery 16 patients reported a clear improvement of their pre-operative complaints while 10 patients reported new functional problems (Table 2). About 20% of the patients in both groups reported an improvement of their pre-operative sexual functional disorders. On the other hand, new functional symptoms were reported significantly more in the preservation group compared to the excision group. Six months after surgery the number of patients with functional sexual symptoms was lower but still significantly higher in the preservation group. This is mainly because new functional symptoms were reported in these group 3 months following surgery and later (n = 3). It should be mentioned,

however, that patients gave different explanations of their symptoms and sexual dysfunction in the preservation group, besides chronic pain and paresthesias, local induration of the inguinal region was a fundamental postoperative complication.

**Table 1:** Groin Pain Score.

Postoperative	Nerve Preserved Group	Nerve Excised Group (Mean $\pm$ SD)	P value
1 month	3.0 $\pm$ 0.77	2.57 $\pm$ 1.0	0.013
6 month	1.61 $\pm$ 1.03	1.04 $\pm$ 1.07	0.485

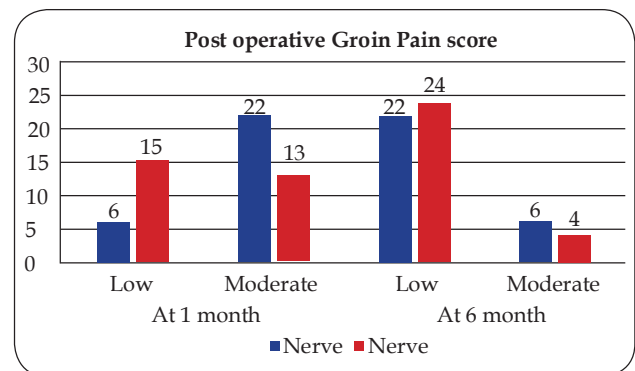


Fig 1: Groin pain score over the time post-operatively.

**Table 2:** Results of sexual function assessment.

Duration	Sexual function assessment	Excision group (n=28)	Preservation group (n=28)
Pre-operative	Sexual dysfunction [n (%)]	12 {40%}	10 {33%}
	Subjective cause of inguinal pain	6	5
	New sexual dysfunction	0	0
3 months Post-operative	Sexual dysfunction [n (%)]	7	10
	Improvement of pre-op dysfunction	7	9
	New sexual dysfunction	2	8
6 months Post-operative	Sexual dysfunction [n (%)]	4	7
	Improvement of pre-op dysfunction	3	3
	New sexual dysfunction	0	1

## Discussion

Chronic groin pain is one of the most debilitating long-term complications after inguinal hernia repair, which can significantly affect the patient's satisfaction and quality of life after the operation. A proposed mechanism for the development of postoperative chronic groin pain is the inflammation and fibrosis induced by the mesh, which is near the ilioinguinal nerve.<sup>9</sup> In addition,

unintentional injury, or strangulation of the ilioinguinal nerve during suturing may also contribute to the phenomenon. There is increasing evidence to suggest that prophylactic excision of ilioinguinal nerve during open hernia repair is not only associated with minimal morbidities but also can potentially decrease the incidence of chronic groin pain following operation.<sup>10</sup>

The first randomized trial to address this problem by Ravichandran et al was underpowered and no definite conclusion could be made.<sup>11</sup> Results from subsequent trials regarding chronic groin pain following elective neurectomy have been inconsistent. Dittrick et al reported a significantly lower incidence of chronic groin pain in patients who had elective neurectomy during open inguinal hernia repair when compared with the control group.<sup>10</sup> However, these results were not confirmed in a recent randomized controlled trial by Picchio et al, who found similar incidence of chronic groin pain between ilioinguinal nerve excision group and control.<sup>13</sup> The results of present study was compared with those of previous studies and we found a groin pain score in ilio inguinal nerve excised group assessed on visual analog scale of 2.57+/- 1.0 at 1 month which is comparable with Dittrick et al study 2.0+/-0.0 but Malekpour et al study at 1 month noted a score of 0.7+/- 0.7 which is less when compared to nerve preserved group and is statically significant .10,14 This is comparable with Makekpour et al.

At 6 months in present study, we noted a pain score of 1.04+/- 1.07 in ilioinguinal nerve preserved group when compared with Dittrick et al of 2.5+/- 0.7 and Malekpour et al of 0.6+/-0.8 which shows no statically significant decrease in groin pain (P=0.485 ; > 0.05).<sup>10,14</sup> This comparable with Dittrick et al.<sup>10</sup> In Zacest et al after ilio inguinal neurectomy at 2 weeks follow up 14 (74%) of 19 patients noted pain improvement.<sup>15</sup> When followed up for 3 yrs 27.8% patients had completely relieved of pain better in 38.9% and no better in 16.7% patients in nerve excised group.

In Wilfred Lik-Man Mui et al study incidence of groin pain at 6 months was significantly lower in nerve excised group than nerve preserved group i.e,8% vs 28.6 % (p= 0.008).<sup>16</sup> In Picchio et al study post-operative groin pain was absent in 73% in ilioinguinal nerve excised group 70% nerve preserved group.<sup>13</sup> At 1 month and 6 months follow up no difference was found between the 2 groups in groin pain, but loss of touch sensation was significantly greater when ilioinguinal nerve was

excised. 1 year after operation the 2 groups were comparable with respect to loss of pain, but touch sensation remained decreased in nerve excised group, which is not comparable with present study.

Complications like seroma, hypoesthesia, pus collection, haematoma and hernia recurrence were assessed in our study Seroma rate of 7 % in nerve preserved group and 11% in nerve excised group was noted in our study which is comparable with 18% and 24% respectively in malekpour et al study.<sup>14</sup>

Hypoesthesia in present study was noted 29% in ilioinguinal nerve excised as compared to 7 % in nerve preserved group more during 1 month follow up. In malekpour et al the intensity of hypoesthesia decrease from 0-3 to 0 by 6 month on visual analog scale and no cases of hypoesthesia occurred in any patient in either group at 1 yr after surgery.<sup>14</sup> No haematoma , No pus collection and no hernial recurrence were seen in any patients in either group when followed upto 6 months . In malekpour et al study complication consisted of 12 cases of post-surgical haematoma, 5 in nerve preservation group and 7 in nerve excised group and 1 hernial recurrence in the nerve preserved group, which is not comparable with our study.<sup>15</sup>

In line with the available literature, in our study it was detected that 33 patients reported pre-operative sexual dysfunction related to the symptoms of the groin hernia which was found to be statistically significant. These complaints had an equally negative influence on potency, erection and orgasm. Three months after surgery<sup>16</sup> patients reported a clear improvement of their pre-operative complaints while 10 patients reported new functional problems. About 20% of the patients in both groups reported an improvement of their pre-operative sexual functional disorders. Similarly Zieren et al. performed a study consisting of 224 patients and investigated the effect of operation on sexual functions after inguinal hernia operation and evaluated patients preoperatively and in the postoperative third and sixth months. They showed that in patients with sexual function disorders, there was recovery in sexual functions after the operation and that the operation had no significant effect on patients with a normal preoperative sexual life.<sup>17</sup> Also El-Awady et al. evaluated sexual functions of 40 patients who had tension-free inguinal hernioplasty in the postoperative third and ninth months and stated that there was recovery in all sexual function parameters, apart from orgasm, after the operation.<sup>18</sup> The results of these studies,

except the study by all indicated improvement of sexual function after hernioplasty

On the other hand, new functional symptoms were reported significantly more in the preservation group compared to the excision group. Six months after surgery the number of patients with functional sexual symptoms was lower but still significantly higher in the preservation group. This is mainly because new functional symptoms were reported in these group 3 months following surgery and later. It should be mentioned, however, that patients gave different explanations of their symptoms and sexual dysfunction in the preservation group, besides chronic pain and paresthesias, local induration of the inguinal region was a fundamental postoperative complication.

Since our patient profile consisted of sexually active patients, there were no serious post-operative complications in the patients and patients who had second inguinal operations were not included in the study, we conclude that the results were positive. We also think that pain is a more important factor. The occurrence of pain during sexual activity can affect overall satisfaction. Furthermore, we think that the presence of hernia has a higher influence on the sexual activity than the effects of the surgery. The patients with no preoperative complaints were not negatively influenced by the surgery as far as their sexual life was concerned. This may be evidence of benefit of surgery.

## CONCLUSION

Ilioinguinal neurectomy is associated with lower incidence of postoperative groin pain when compared to nerve preservation and reduces the risk of nerve entrapment. primary neurectomy of the ilioinguinal nerve during groin hernia surgical repair with a mesh implantation could have a favourable influence on postoperative sexual function without any significant relevant complications. It causes significantly less sexual problems compared to preservation of the nerve and it is recommended especially for patients with preoperative sexual dysfunction due to the groin hernia.

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