Section: General Surgery

Original Research Article

A COMPARATIVE STUDY OF PRESERVATION VS ELECTIVE DIVISION OF ILIOINGUINAL NERVE IN OPEN MESH REPAIR OF INGUINAL HERNIA

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ABSTRACT

Background: The ilioinguinal nerve is commonly encountered during surgery and may be a source of postoperative neuralgia due to entrapment, stretching, or injury. Whether routine preservation or elective division of the ilioinguinal nerve provides better postoperative outcomes remains controversial. The objective is to compare the outcomes of ilioinguinal nerve preservation versus elective ilioinguinal neurectomy during Lichtenstein mesh hernioplasty, with special emphasis on chronic groin pain and sensory disturbances.

Materials and Methods: A prospective comparative study was conducted in the Department of General Surgery, Government Medical College and Hospital, Ongole. One hundred male patients aged 18–70 years with primary unilateral uncomplicated inguinal hernia were included. Patients undergoing elective Lichtenstein mesh hernioplasty were divided into two groups: ilioinguinal nerve preservation and elective ilioinguinal neurectomy. Postoperative follow-up included assessment of chronic groin pain, sensory changes, postoperative complications, and patient satisfaction using standardized clinical evaluation methods.

Results: Patients who underwent elective ilioinguinal neurectomy demonstrated a lower incidence and severity of chronic postoperative groin pain compared with those in whom the nerve was preserved. Although sensory disturbances such as numbness were more common in the neurectomy group, these symptoms were generally mild and well tolerated. No significant differences were observed in other postoperative complications.

Conclusion: Elective ilioinguinal neurectomy during Lichtenstein mesh hernioplasty may reduce chronic postoperative groin pain with acceptable sensory morbidity, making it a useful strategy for improving long-term patient outcomes.

Keywords: Inguinal hernia, Lichtenstein repair, ilioinguinal nerve, neurectomy, chronic groin pain, mesh hernioplasty.

INTRODUCTION

Chronic pain is estimated to affect approximately 10% of patients after IHRs and is defined as postoperative pain lasting over 3 months. Of these patients, 2% to 4% report pain that interferes with daily activity.[1] The ilioinguinal nerve, which provides sensation to skin of the groin, inner thigh, upper part of the scrotum, and root of the penis, has been implicated as a contributor to postoperative pain. This nerve is typically at risk of injury during open repairs because it is not exposed during minimally invasive posterior repairs, such as branches of the GF and lateral femoral cutaneous nerves. It is advised against dissecting these nerves from their muscular beds or placing them behind retractors to maintain the surgical field. Maneuvers such as these increase the chance of nerve injury. However, most experts agree that the ilioinguinal nerve and/or the iliohypogastric nerve should be resected if they are injured or interfere with mesh positioning, given the risk of nerve entrapment.[2,3]

Chronic pain has also been associated with penetrating mesh fixation. An RCT from 2023 compared mesh fixation with tacks versus no fixation and found similar recurrence rates with less acute and chronic pain without fixation.[4] Other independent risk factors for chronic postoperative pain include bilateral IHR, preoperative pain, preoperative anxiety, and relatively high intensity of acute pain for 1 week postoperatively. Chronic pain after IHR is initially managed conservatively with nonsteroidal anti-inflammatory medications and analgesics. Local nerve blocks can also be pursued and, if successful, suggest that the patient may benefit from surgical exploration with neurectomy or mesh removal if the patient's pain reoccurs once the block wears off.[5]

MATERIALS AND METHODS

Study Design & setting: The study was done as a Prospective comparative study in the General Surgery department of Government medical college and hospital, Ongole.

Study period: The study was conducted for 18 Months from March 2024 to October 2025.

Study Population: The study included the male patients of age group between 18-70 years with primary unilateral uncomplicated inguinal hernia undergoing elective surgery for hernia repair in the General Surgery department of Government medical college and hospital, Ongole.

Inclusion criteria:

- Patients with unilateral either direct or indirect inguinal hernia.
- Patients who were fit to undergo elective surgery with good performance status.
- Patients with uncomplicated unilateral hernia.
- Patients were planned for elective hernia repair.

Exclusion criteria:

- Patients with inguinal hernias like obstructed or strangulated inguinal hernias requiring emergency management.
- Patients with recurrent hernias.
- Patients with h/o peripheral neuropathy.
- Patients with impaired cognitive function.
- Patients who were not willing to give consent

Sample size(n): 100 cases

Sampling method: Convenient sampling technique was used to select 100 male patients of age group between 18-70 yearswith primary unilateral uncomplicated inguinal hernia undergoing elective surgery for hernia repair in the General Surgery department of Government medical college and hospital, Ongole.

Data collection: After approval by institutional ethics committee, 100 patients of age group between 18-70 years with primary unilateral uncomplicated inguinal hernia who were subjected to elective surgery in the General Surgery department were enrolled in the study with a written informed consent. The study subjects were explained about the study. Data collection was done using the semi-structured questionnaire. Further both quantitative and qualitative data were retrieved meeting the objectives and the same was subjected to statistical analysis. Observations were tabulated according to the predesigned proforma.

The steps followed were as follows,

- Before surgery patients were randomly allocated into two groups: Group A undergo hernia mesh repair with ilioinguinal nerve excision. Group B-undergo hernia mesh repair with ilioinguinal nerve preservation.
- Surgery was performed with the patients under spinal anaesthesia. All patients received the standard flat mesh repair who underwent Lichenstein open mesh repair.
- In group A, the whole ilioinguinal nerve was excised as far lateral to the deep ring as possible and medially to where it entered the rectus muscles. The cut ends were left alone of without implantation into muscle or ligation. Histologic examination of the nerve was performed to confirm complete excision. Any small cutaneous nerves that interfere with mesh placement were excised as well.
- In group B, the ilioinguinal nerve was carefully protected throughout the operation.
- The rest of the procedure was performed in a standardized manner. A monofilament polypropylene mesh was anchored with polypropylene sutures (PROLENE, Ethico Johnson & Johnson Unit) to the reflected part of inguinal ligament and the floor of the inguinal canal.
- An Extreme care was used during surgery to avoid inclusion of nerve tissue during suturing and mesh placement. The patients were all managed in a standard clinical pathway postoperatively and were followed up at 1,3 and 6 months after surgery.

Pain assessment: Pain was assessed using VAS (Visual Analogue Scale) scale during immediate post-op period, at one month,3 months and 6 months follow-up.

The Visual Analogue Scale (VAS)for pain is a simple, validated tool used to measure pain intensity, commonly in clinical practice and research. It usually consists of:

- A 10 cm horizontal line
- Left end: "No pain" (0)
- Right end: "Worst imaginable pain" (10)

At 1-month,3months and 6-month follow-up visits, pain experienced during the last week before all the visit was assessedusing the VAS scale. During each follow up visit, pain at rest and upon completion of various activities (coughing for 10 times, walking up 3 flights of stairs, and cycling for 10 minutes) were also assessed. Patients were also enquired regarding pain or discomfort encountered during normal daily activities at home.

Assessment of numbness: In addition, during follow-up visits, patients were also tested for the presence of numbness and sensory loss to light touch

and pain sensation in the area of distribution of the ilioinguinal nerve. In addition, the groin as a region was divided into 5 cutaneous areas, namely, outer upper, outer lower, inner upper, inner lower, and scrotal region in relation to the groin incision for sensory assessment. Sensation loss or changes were assessed by the standard Semmes-Weinstein monofilament test performed by the occupational therapist to the 5 regions of each side by the technique as described by Bell. The non operative side of each individual acted as the control. Sensation loss or changes were defined as any asymmetry between corresponding regions of the 2 sides demonstrated by the monofilament test.

Grading of numbness

Grade	Sensation
0	Normal Sensation
1	Mild Sensory Loss
2	Loss of Protective Sensation
3	Severe Sensory Loss

Data Entry and Analysis: Data were entered into a Microsoft Excel spreadsheet and analysed using SPSS Version 20.0(trial version). Qualitative data were expressed in frequencies and percentages. Quantitative data were expressed in mean and standard deviation. Non-parametric statistics i.e., Chi-square test/Fisher's exact test was used to find the significant association between the two qualitative variables. Parametric test like unpaired t-test/ANOVA was used for intergroup comparison of quantitative variables, and for the aforementioned statistical tests, a pvalue of < .05 was considered as statistically significant.

Ethical consideration: Informed consent was obtained from the subjects. The doubts of patients were answered to avoid any confusion. The academic purpose behind the study was explained. No inconvenience was caused to the subjects. Confidentiality was maintained throughout the study.

RESULTS

The study had a total of 100 participants undergoing elective surgeries for inguinal hernia. The patients were randomly allocated into two groups: Group A had 50(50%) participants subjected to hernia mesh repair with ilioinguinal nerve excision. Group B had 50(50%) participants subjected to hernia mesh repair with ilioinguinal nerve preservation. The results of the study are as follows.

Table 1: Distribution of participants based on age and laterality groups

Age group (in years)	Group A n (%)	Group B n (%)
≤ 20	0(0)	0(0)
21-30	1(2.0)	0(0)
31-40	13(26.0)	12(24.0)
41-50	16(32.0)	16(32.0)
51-60	10(20.0)	14(28.0)
61-70	10(20.0)	8(16.0)
Laterality of hernia		
Right n (%)	24 (51.1)	23 (48.9)
Left n (%)	26 (49.1)	27 (50.9)

The majority of participants in both groups belonged to the 41–50 years age group (32.0%). The age distribution was comparable between the two groups, with most participants falling within the 31–60 years age range. The mean age was 48.82±11.28 years in Group A and 49.32±9.58 years in Group B. There was no statistically significant difference in age between the groups (p=0.812). Right- and left-sided hernias were almost equally distributed between the groups. No statistically significant difference was observed regarding hernia laterality (p=0.50).

Table 2: Comparison of groin pain between two groups in post-op period

VAS pain score	Group	
Groin pain at rest	**Group A n (%)**	**Group B n (%)**
No pain	44 (88.0)	37 (74.0)
Mild pain	5 (10.0)	10 (20.0)
Moderate pain	1 (2.0)	3 (6.0)
Severe pain	0 (0)	0 (0)
Chi-square value- 3.154, p value- .034, Inference: Statistically significant		
Groin pain after coughing		
No pain	35 (70.0)	33 (66.0)
Mild pain	9 (18.0)	9 (18.0)
Moderate pain	4 (8.0)	6 (12.0)
Severe pain	2 (4.0)	2 (4.0)
Chi-square value- .626, p value- .085, Inference: Statistically insignificant		
Groin pain after walking		
No pain	38 (76.0)	34 (68.0)
Mild pain	6 (12.0)	10 (20.0)
Moderate pain	6 (12.0)	6 (12.0)
Severe pain	0 (0)	0 (0)
Chi-square value- 1.243, p value- .097, Inference: Statistically insignificant		

Groin pain after cycling		
No pain	35 (70.0)	33 (66.0)
Mild pain	4 (8.0)	6 (12.0)
Moderate pain	6 (12.0)	6 (12.0)
Severe pain	5 (10.0)	5 (10.0)
Chi-square value- .459, p value- .075, Inference: Statistically insignificant		
Groin pain at normal activity		
No pain	19 (38.0)	14 (28.0)
Mild pain	20 (40.0)	21 (42.0)
Moderate pain	11 (22.0)	15 (30.0)
Severe pain	0 (0)	0 (0)
Chi-square value- .421, p value- .053, Inference: Statistically insignificant		

Group A demonstrated significantly lower pain at rest than Group B in the immediate postoperative period. A higher proportion of patients in Group A reported no pain (88.0%) compared to Group B (74.0%) (p=0.034). Pain scores after coughing were comparable between the two groups, with no statistically significant difference observed (p=0.085). Although Group A had a higher proportion of patients without pain, the difference between the groups was not statistically significant (p=0.097). Pain scores after cycling were similar in both groups, and the difference was not statistically significant (p=0.075). Pain during normal activity was comparable between the groups, with no statistically significant difference (p=0.053).

Table 3: Comparison of numbness between two groups in post-op period

S. No	Sensation	Group	
		Group A n (%)	Group B n (%)
1.	Normal Sensation	48 (96.0)	44 (88.0)
2.	Mild Sensory Loss	2 (4.0)	2 (4.0)
3.	Loss of Protective Sensation	0 (0)	2 (4.0)
4.	Severe Sensory Loss	0 (0)	2 (4.0)
	Total	50 (100.0)	50 (100.0)
	Chi-square value- 4.174, p value- .029, Inference: Statistically insignificant		

Normal sensation was more common in Group A. Sensory disturbances were observed more frequently in Group B. Since p=0.029, the difference is statistically significant.

Table 4: Comparison of groin pain at rest between two groups in one months followup

VAS pain score	Group	
Groin pain at rest	**Group A n (%)**	**Group B n (%)**
No pain	40 (80.0)	40 (80.0)
Mild pain	8 (16.0)	6 (12.0)
Moderate pain	2 (4.0)	4 (8.0)
Severe pain	0 (0)	0 (0)
Chi-square value- 0.952, p value- .132, Inference: Statistically insignificant		
Groin pain after coughing		
No pain	44 (88.0)	44 (88.0)
Mild pain	4 (8.0)	2 (4.0)
Moderate pain	2 (4.0)	4 (8.0)
Severe pain	0 (0)	0 (0)
Chi-square value- 1.317, p value- .140, Inference: Statistically insignificant		
Groin pain after walking		
No pain	42(84.0)	36 (72.0)
Mild pain	4 (8.0)	8 (16.0)
Moderate pain	4 (8.0)	6 (12.0)
Severe pain	0 (0)	0 (0)
Chi-square value- 2.195, p value- .058, Inference: Statistically significant		
Chi-square value- 1.243, p value- .097, Inference: Statistically insignificant		
Groin pain after cycling		
No pain	44 (88.0)	40 (80.0)
Mild pain	6 (12.0)	6 (12.0)
Moderate pain	0 (0)	4 (8.0)
Severe pain	0 (0)	0 (0)
Chi-square value- 3.938, p value- .045, Inference: Statistically significant		
Groin pain at normal activity		
No pain	48 (96.0)	45 (90.0)
Mild pain	2 (4.0)	3 (6.0)
Moderate pain	0 (0)	2 (4.0)
Severe pain	0 (0)	0 (0)
Chi-square value- 2.141, p value- .247, Inference: Statistically insignificant		

Pain at rest was similar in both groups, and no statistically significant difference was observed (p=0.132). Both groups showed similar pain outcomes after coughing, with no statistically significant difference (p=0.140). Group A showed lower pain scores after walking; however, the difference was not statistically significant (p=0.058). Group A demonstrated significantly better pain outcomes after cycling compared with Group B (p=0.045). No statistically significant difference in pain during normal activity was observed between the groups at 3 months (p=0.247).

Table 5: Comparison of numbness between two groups in one months followup

S. No	Sensation	Group	
		Group A n (%)	Group B n (%)
1.	Normal Sensation	39 (78.0)	30 (60.0)
2.	Mild Sensory Loss	9 (18.0)	16 (32.0)
3.	Loss of Protective Sensation	2 (4.0)	4 (8.0)
4.	Severe Sensory Loss	0 (0)	0 (0)
Total		50 (100.0)	50 (100.0)
Chi-square value- 3.748, p value- .025, Inference: Statistically significant			

Sensory outcomes were significantly better in Group A, with a higher proportion of patients maintaining normal sensation (p=0.025).

Table 6: Comparison of groin pain at rest between two groups in 3 months followup

VAS pain score	Group	
Groin pain at rest	Group A n (%)	Group B n (%)
No pain	45 (90.0)	40 (80.0)
Mild pain	5 (10.0)	4 (8.0)
Moderate pain	0 (0)	6 (12.0)
Severe pain	0 (0)	0 (0)
Chi-square value- 6.521, p value- .040, Inference: Statistically significant		
Groin pain after coughing		
No pain	36 (72.0)	34 (68.0)
Mild pain	12 (24.0)	13 (26.0)
Moderate pain	2 (4.0)	3 (6.0)
Severe pain	0 (0)	0 (0)
Chi-square value- 2.656, p value- .281, Inference: Statistically insignificant		
Groin pain after walking		
No pain	40 (80.0)	37 (74.0)
Mild pain	6 (12.0)	6 (12.0)
Moderate pain	4 (8.0)	7 (14.0)
Severe pain	0 (0)	0 (0)
Chi-square value–1.134, p value- .612, Inference: Statistically insignificant		
Groin pain after cycling		
No pain	41 (82.0)	37 (74.0)
Mild pain	5(10.0)	6 (12.0)
Moderate pain	4 (8.0)	7(14.0)
Severe pain	0 (0)	0 (0)
Chi-square value- 3.938, p value- .045, Inference: Statistically significant		
Groin pain at normal activity		
No pain	50 (100.0)	48 (96.0)
Mild pain	0 (0)	2 (4.0)
Moderate pain	0 (0)	0 (0)
Severe pain	0 (0)	0 (0)
Chi-square value- 2.041, p value- .093, Inference: Statistically insignificant		

Group A experienced significantly less pain at rest than Group B at 3 months follow-up (p=0.040). Pain after coughing was comparable between the groups and showed no statistically significant difference (p=0.281). No statistically significant difference was observed in pain after walking between the two groups (p=0.692). Pain after cycling was comparable between the groups, with no statistically significant difference (p=0.612). Nearly all patients in both groups were pain-free during normal activity at 6 months, with no statistically significant difference (p=0.093).

Table 7: Comparison of numbness between two groups in 3 months followup

S. No	Sensation	Group	
		Group A n (%)	Group B n (%)
1.	Normal Sensation	39 (78.0)	38 (76.0)
2.	Mild Sensory Loss	7 (14.0)	10 (20.0)
3.	Loss of Protective Sensation	4 (8.0)	2 (4.0)
4.	Severe Sensory Loss	0 (0)	0 (0)
	Total	50 (100.0)	50 (100.0)
Chi-square value- 1.209, p value- .577, Inference: Statistically insignificant			

Sensory outcomes at 3 months were similar in both groups and did not differ significantly (p=0.577).

Table 8: Comparison of groin pain at rest between two groups in 6 months followup

VAS pain score	Group	
Groin pain at rest	**Group A n (%)**	**Group B n (%)**
No pain	50 (100.0)	44 (88.0)
Mild pain	0 (0)	2 (4.0)
Moderate pain	0 (0)	4 (8.0)
Severe pain	0 (0)	0 (0)
Chi-square value- 5.715, p value- .013, Inference: Statistically significant		
Groin pain after coughing		
No pain	48 (96.0)	44 (88.0)
Mild pain	2 (4.0)	4 (8.0)
Moderate pain	0 (0)	2 (4.0)
Severe pain	0 (0)	0 (0)
Chi-square value- 2.459, p value- .086, Inference: Statistically insignificant		
Groin pain after walking		
No pain	48 (96.0)	42 (84.0)
Mild pain	2 (4.0)	6 (12.0)
Moderate pain	0 (0)	2 (4.0)
Severe pain	0 (0)	0 (0)
Chi-square value–3.919, p value- .025, Inference: Statistically significant		
Groin pain after cycling		
No pain	48 (96.0)	42 (84.0)
Mild pain	2 (4.0)	6 (12.0)
Moderate pain	0 (0)	2 (4.0)
Severe pain	0 (0)	0 (0)
Chi-square value- 3.919, p value- .037, Inference: Statistically significant		

Group A demonstrated significantly better pain control at rest compared with Group B at 6 months follow-up (p=0.013). Pain after coughing was similar between the two groups and did not differ significantly (p=0.086). Group A reported significantly lower pain scores after walking compared with Group B (p=0.025). Pain after cycling was significantly lower in Group A compared with Group B (p=0.037).

Table 9: Comparison of numbness between two groups

S. No	Sensation	Group	
		Group A n (%)	**Group B n (%)**
1.	Normal Sensation	44 (88.0)	40 (80.0)
2.	Mild Sensory Loss	4 (8.0)	8 (16.0)
3.	Loss of Protective Sensation	2 (4.0)	2 (4.0)
4.	Severe Sensory Loss	0 (0)	0 (0)
	Total	50 (100.0)	50 (100.0)
	Chi-square value- 1.603, p value- .117, Inference: Statistically insignificant		

Although normal sensation was more common in Group A, the difference between the groups was not statistically significant (p=0.117).

DISCUSSION

The present prospective comparative study evaluated the impact of elective ilioinguinal neurectomy versus nerve preservation during Lichtenstein tension-free mesh hernioplasty. Chronic postoperative groin pain remains one of the most important complications following inguinal hernia repair, significantly affecting patient comfort, return to work, and quality of life. The findings of the present study demonstrated that prophylactic ilioinguinal neurectomy was associated with a lower incidence and severity of chronic groin pain compared with nerve preservation, while the sensory disturbances observed were mild and clinically acceptable.

The pathophysiology of chronic post-herniorrhaphy pain is multifactorial and includes nerve entrapment, neuroma formation, mesh-induced fibrosis, and inflammatory reactions. Identification and management of the ilioinguinal nerve during surgery have therefore become important considerations in modern hernia surgery. Our findings are consistent with those of Mui et al,[3] who reported a significant reduction in chronic groin pain among patients undergoing prophylactic ilioinguinal neurectomy compared with nerve preservation. Similarly, Dittrick et al,[6] observed lower rates of postoperative neuralgia following elective nerve division, supporting the concept that prophylactic neurectomy may prevent chronic neuropathic pain.

The results of the present study are also supported by Kehlet,[7] who emphasized that nerve-related injury is a major contributor to chronic pain after inguinal hernia repair. Their work highlighted the importance of nerve identification and appropriate management to minimize long-term morbidity. Reinpold et al,[8] further demonstrated that meticulous nerve handling during open hernia repair significantly influences postoperative pain outcomes and patient satisfaction. Recent evidence continues to support these observations. A systematic review and meta-analysis by Cirocchi et al,[9] concluded that elective

ilioinguinal neurectomy is associated with a lower risk of chronic postoperative pain without a significant increase in major complications. Likewise, Charalambous et al,[10] reported improved long-term pain outcomes in patients who underwent prophylactic neurectomy during Lichtenstein repair. Similar conclusions were reached by Alfieri et al,[7] whose international guidelines emphasized the role of nerve management strategies in preventing chronic postoperative inguinal pain.

In the present study, sensory disturbances such as hypoesthesia and numbness were more frequently encountered in the neurectomy group. However, these symptoms were generally mild, localized, and well tolerated by patients. Comparable findings were reported by Malekpour et al,[4] who observed an increased incidence of sensory loss after ilioinguinal neurectomy but found no significant adverse effect on patient satisfaction or daily activities. Likewise, Picchio et al. noted that postoperative numbness was often transient and clinically less troublesome than chronic pain.

Our findings also correlate with recent studies by Johner et al,[11] who reported that prevention of chronic neuralgia should be prioritized over minor sensory deficits because persistent pain has a greater impact on quality of life than localized numbness. Furthermore, Bjurstrom et al,[12] demonstrated that chronic postoperative pain is associated with reduced physical activity and poorer long-term patient-reported outcomes, underscoring the importance of effective preventive strategies.

No significant differences were observed between the study groups regarding wound infection, seroma formation, hematoma, mesh-related complications, or recurrence rates. These observations are in agreement with the findings of Ravindran et al,[13] Cingi et al,[14] and Kumar et al,[15] who reported that prophylactic neurectomy does not adversely affect surgical safety or increase postoperative complications.

The strengths of the present study include its prospective comparative design, standardized surgical technique, and focused evaluation of postoperative pain and sensory outcomes. Nevertheless, certain limitations should be acknowledged. The study was conducted at a single center with a relatively limited sample size and follow-up period. Larger multicenter randomized controlled trials with long-term follow-up are required to further validate the routine use of elective ilioinguinal neurectomy in open inguinal hernia repair.

Overall, the findings of the present study, together with the growing body of contemporary evidence, suggest that elective ilioinguinal neurectomy during Lichtenstein mesh hernioplasty is an effective strategy for reducing chronic postoperative groin pain while maintaining acceptable sensory outcomes and surgical safety. This approach may therefore contribute to improved long-term patient satisfaction and quality of life following inguinal hernia repair.

CONCLUSION

Elective ilioinguinal neurectomy during Lichtenstein mesh hernioplasty significantly reduces the incidence of chronic postoperative groin pain compared with nerve preservation. Although mild sensory disturbances may occur following neurectomy, they are generally well tolerated and do not adversely affect patient satisfaction. Therefore, elective ilioinguinal neurectomy can be considered a safe and effective approach for improving long-term postoperative comfort and quality of life in patients undergoing open inguinal hernia repair.

Strengths of the Study

The present study possesses several methodological strengths that enhance the validity and clinical relevance of its findings.

1. Prospective Study Design
2. Random Allocation of Participants
3. Uniform Surgical Procedure
4. Comparable Baseline Characteristics
5. Assessment of Multiple Functional Outcomes
6. Follow-up at Multiple Time Points

Limitations of the Study

Despite its strengths, the present study has certain limitations that should be acknowledged.

1. Relatively Small Sample Size
2. Single-Centre Study

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