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Research Paper

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Results of Unilateral paraspinal muscle sparing bilateral laminotomy

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ABSTRACT

Objective: To evaluate efficacy of unilateral paraspinal muscle spsaring bilateral laminotomy by means of spinous process osteotomy compared with conventional laminectomy in management of lumbar canal stenosis and lumbar disc prolapse.

Methods: Forty consecutive patients of lumbar canal stenosis and lumbar disc prolapsed were operated using these two techniques. Patients were operated randomly using either of the technique with or without discectomy. Results between the groups were compared using following measures: duration of hospital stay, post operative pain free sitting and return to work, complication rate.

Result: both the group did not differ significantly in terms of age, sex or level of operation. Results were graded primarily using GREENGOUGH scoring system pre and post operatively. Using this scoring system outcome did not differ much in either of the technique although patients operated by laminotomy did well in terms of post operative reduced hospital stay, earlier pain free sitting and overall reduction in complication and faster and improved rehabilitation.

Conclusion: Although overall outcome of the patients at final follow up remains mostly unchanged, technique of sparing unilateral paraspinal muscles and there by sparing supraspinous and interspinous ligaments does help in earlier rehabilitations of the patients, fastens the recovery and brings in overall feeling of well being and patient satisfaction.

KEYWORDS: lumbar stenosis, spinous process , laminotomy , laminectomy

Introduction:

Low back pain-sciatica is one of the common problems of patient in orthopaedic clinic. First description of lumbar canal stenosis was given by SACHS and FRANKEL in 1900 but its first clinical description is attributed to HENK VERBIEST – a Dutch neurosurgeon --given in 1954[1]. Since then surgeon are searching for accurate method of definite diagnosis and operative treatment for the same. Weiner and colleagues and Yong-Hing and Kirkaldy-Willis reported results of successful spinous-process osteotomies for spinal stenosis decompression, in which one side of the paraspinal muscle is divided and the spinous processes are cut horizontally at the junction of the lamina and spinous process[2,3]. We have also compared the same technique of unilateral paraspinal muscle sparing bilateral laminotomy with or without discectomy against conventional laminectomy and discectomy for the patients having lumbar canal stenosis and lumbar disc prolapsed.

Material and methods:

A retrospective and prospective study of 40 patients who had undergone surgery for prolapsed intervertebral disc or lumbar canal stenosis was carried out. Patients were operated using two different techniques namely unilateral paraspinal muscle sparing bilateral laminotomy with or without discectomy and other being conventional laminectomy with discectomy. Patients with minimum follow up of five months were included; those not satisfying it were excluded from the study. A total no of patient included in either of the group are 20. Patients were distributed in both the groups randomly.

Procedure for laminotomy

After giving general anaesthesia, patient is shifted on table in prone position on spine frame, after painting and drapping , skin incision and cutting subcutaneous tissue is cut and lumbar fascia is cut in the line with incision, then paraspinal muscles from only one side of the spinous process are erased leaving the other side of muscles intact. Then with the use of osteotome spinous process are osteotomised at the base with the junction of the lamina. Now spinous process along with the intact paraspinal muscles of one side are retracted and decompression is done. If indicated discectomy is done. After completing the procedure spinous process reverts back to the postion.

Procedure for conventional laminectomy

In this paraspinal muscles from both the sides are erased and spinous process is sacrified, leaving a wide open space post operatively.

Patient assessment

Patients were evaluated using GREENGOUGH scoring system pre and post operatively. Also post operative pain free sitting, return to work, overall complication rate, complications requiring active intervention were compared.

Scoring system used is GREENBOUGH scoring system [4]

Results:

Laminotomy

A total no of 20 patients were operated using this technique over a period of three years. Patients ranged from 25 years to 65 years (mean age 41.2 years).17 patients were operated for single level and three patients were operated for more than one level. Duration of hospital stay ranged from 4 to 13 days mean being 7 days. More than 85% of the patients were able for pain free sitting within first 8 weeks post operatively with 55% of the patients being able to return to work within 6 months. Only 15% of the patients developed complication amongst them all were treated conservatively and all doing well at final follow up. At final follow up 60% of the patients had either excellent or good result against only 5% patient had poor result.

Table 1

	Laminotomy	Laminectomy
Pain free sitting within 8 week	85%	50%
Return to work in 6 months	55%	35%
Complication rate	15%	25%

Conventional Laminotomy

A total no of 20 patients were operated using this technique over a period of three years. Patients ranged from 21 years to 65 years (mean age 47.8 years).15 patients were operated for single level and 5 patients were operated for more than one level. Duration of hospital stay ranged from 3 to 30 days mean being 9.55 days. Approximately 50 % of the patients were able for pain free sitting within first 8 weeks post operatively with 35% of the patients being able to return to work within 6 months. 25% of the patients developed complication amongst them 15% of the patients required active intervention. 65% of the patients had either excellent or good result against only 10% patient had poor result.

Table 2-- results

	Laminotomy	Laminectomy
Excellent	45%	40%
Good	15%	25%
Fair	35%	25%
Poor	5%	10%

Discussion:

Duration of hospital stay

Amongst the **LAMINOTOMY** group 65% of the patients were discharged within 7 days of operation while in **LAMINECTOMY** operated patients only 35% of the patients could be discharged within a week. Suggesting that overall duration of hospital stay could be reduced with choosing laminotomy as a procedure and this could be attributed to reduced soft tissue dissection and preventing damage to unilateral paraspinal muscles, supraspinous and interspinous ligaments in this procedure with minimizing damage and reducing operative time there by further reducing chances of developing procedure related complications in perioperative and postoperative period and there by patients could be discharged uneventfully.

Pain free sitting from

85% percent of the patients IN LAMINOTOMY group had started sitting in first eight weeks with minimum pain as compared to only 50% percent patients in LAMINECTOMY group. This suggest that the sparing supraspinous and interspinous ligaments with causing minimum damage to paraspinal muscles prevents gross instability and help in early mobilization of the patients.

Return to normal work

IN LAMINOTOMY group at least 55% of the patients returned to their work within 6 months of duration as compared to 35% in LAMINECTOMY group. This is again reflecting overall earlier rehabilitation of the patients operated by laminotomy with discectomy against laminectomy

More than one level

When more than one level is to be operated, laminotomy and decompression provides good option as duration of hospital stay could be reduced, early mobilization of the patient could be achieved in the form of earlier pain free sitting and feeling of wellness further complications requiring active interventions are low thereby improving functional outcome.

Complication rate

Overall complication rate is higher amongst the laminectomy operated patients may it be major or minor also those requiring active intervention. This could be attributed to more soft tissue damage occurring during wide area of dissection and consequent long duration of surgery, also more soft tissue damage results in more post operative instability causing pain.

Result

When comparing the outcomes by the the scoring system (GREENBOUGH) we used, 45 % of the patients operated for laminotomy had excellent results and 40% of the patients operated for laminectomy had excellent results and 5 and 10% of the patients operated by laminotmy and laminectomy respectively had poor results.This suggest that patients operated by either of the technique had no effect on overall outcome of the patient, it is the proper diagnosis and properly operated procedure that is the required thing for good outcome though laminotomy operated patients do suffer less with reduced morbidity with earlier rehabilitation and overall improved patient satisfaction.

Conclusion:

Rehabilitation of the patient becomes faster as patient starts earlier sitting when operated by laminotomy as compared with laminectomy and consequent earlier return to normal routine life can be expected. Duration of hospital stay is significantly reduced amongst the patients operated by unilateral laminotomy and decompression as compared with laminectomy, thereby reducing morbidity and burden to hospital and preventing hospital acquired complications. When more one level is to be operated duration of hospital stay is reduced, patient can be mobilized earlier and complication rate is reduced by laminotomy. Complications requiring active interventions are far less in patients operated by laminotomy as compared to operated by laminectomy. Although overall outcome of the patients at final follow remains mostly unchanged, technique of sparing unilateral paraspinal muscles and there by sparing supraspinous and interspinous ligaments does help in earlier rehabilitations of the patients, fastens the recovery from one of the most debilitating disease- disc prolapse and lumbar canal stenosis and thereby reducing psychiatric problems related to it, saves many man hours of one's' life going in wastage and brings in overall feeling of well being and patient satisfaction.

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