Leg Pain Relief After Fenestration and Microdiscectomy in Patients Having Sciatica due to Lumbar Intervertebral Disc Prolapse.

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Abstract

Background: To assess the relief of leg pain after fenestration and microdiscectomy in patients having sciatica due to lumbar intervertebral disc prolapse.

Methods: In this descriptive cross sectional study 100 patients both male and female, undergoing fenestration and microdiscectomy for prolapsed unilateral single level lumbar intervertebral disc, were selected. Leg pain was assessed using visual analogue scale (VAS) before surgery. Postoperative leg pain was assessed using VAS on 3rd postoperative day and 7th postoperative day. Preoperative and postoperative pain scores were noted and compared.

Results: Out of total 100 patients 74 were male and 26 were female. Age distribution was from 20 to 65 years. Mean age was 38.18 ± 9.29. The mean decrease in VAS leg pain score was 3.72 points (mean preoperative 7.07 to mean postoperative 3.35 at 3rd postoperative day). The mean decrease in VAS leg pain score was 3.87 points (mean preoperative 7.07 to mean postoperative 3.20 at 7th postoperative day). Majority (92%) reported a decrease in greater than 2 points at both 3rd and 7th postoperative days.

Conclusion: In comparison to microdiscectomy, disc excision by fenestration has yielded almost comparable results.

Key Words: Fenestration, Microdiscectomy, Leg pain.

Introduction

Approximately 12-33% of the adult work force is affected by low back pain each year, and it has been suggested that between 70% and 95% of adults will suffer from low back pain at some time during their lifetime. Lumbar disc herniation is among the most common causes of lower-back pain and sciatica. Lumbar radicular pain (sciatic pain, radiating low back pain) is a common cause of work disability. It is usually caused by compression or irritation of one of the lumbosacral nerve roots, and is a common symptom of lumbar disc herniation. Straight leg raising restriction or other clinical signs of rhizopathy can be usually found in patients with disc herniation-induced radicular pain. The Straight Leg Raising (SLR) test has been used as the primary test to diagnose lumbar disc herniations and found to have high correlation with findings on operation since its sensitivity is high in only disc herniations leading to root compression that may eventually need operation. When the nucleus of a lumbar intervertebral disc extrudes through the enveloping annulus fibrosus capsule the adjacent nerve roots may be compressed. Sciatica, a myotomal pain radiating to either of the legs along the nerve, is the most characteristic symptom of a herniated intervertebral disc. Disc prolapse is by far the most popular and common cause of sciatica with lesions occurring most often at L4-L5 and L5-S1 segments.

Various nonoperative and operative treatment strategies have been tried with varying degrees of success. Treatment often involves patient education, physical therapy, alternative medicine options, and pharmaco-therapy. If these fail, surgical intervention is usually recommended. Early surgery achieved more rapid relief of sciatica than conservative care.

Diagnosis mainly involves history taking and physical examination. MRI is the preferred imaging modality, as it can visualize soft tissues better than CT and does not expose the patient to ionizing radiation. During the last two decades, new microinvasive techniques have been introduced into the treatment of lumbar disc herniation. The potential benefits of microinvasive disc surgery are the reduced surgical trauma to the tissue, increased safety due to good visualization of the operation field under the microscope and, consequently, reduced postoperative morbidity and shorter hospitalization in comparison to conventional surgery. Surgeons have sought to reduce operative trauma to the spine by adopting microdiscectomy, (microscope-assisted or endoscopic), which is used to treat single-level disc injury in working-age adults. Lumbar microdiscectomy, relies on the operating microscope.
Procedure of interlaminar fenestration and open disc excision under direct vision offers adequate exposure for lumbar disc excision with a smaller incision, lesser morbidity, shorter convalescence, early return to work and comparable overall results in the centers where facilities for endoscopic or percutaneous discectomy are not available. A wide fenestration procedure is preferred to prevent the occurrence of post-operative instability. With proper patient selection, surgery for lumbar disc herniation and sciatica can be expected to lead to excellent results in the majority of patients.

Patients and Methods

This descriptive study was carried out from September 2009 to March 2011, at Neurosurgery department of District Headquarters Hospital and Holy Family Hospital Rawalpindi. One hundred patients both male and female, undergoing fenestration and microdiscectomy for prolapsed unilateral single level lumbar intervertebral disc, were selected for the present study. Leg pain was assessed using VAS before surgery. All the patients who presented with backache, typical radiating pain, weakness, muscle wasting or reflex abnormality were evaluated. Clinical history, examination and MRI were the main diagnostic modalities. SLR test was done for assessing restriction in leg raising. Patients were given a general endotracheal anesthesia and placed on the operating table in the knee-chest position. A lateral lumbar radiograph confirmed the correct interspace, which was then marked. A midline incision followed by a unilateral subperiosteal dissection of the muscles and tendons from the spinous processes and laminae was performed. The ligamentum flavum was excised till the neural tube and a small laminotomy was carried out to expose the outer part of the nerve root compressed by the disc fragment. Once the root was retracted, the bulging annulus was identified and incised in a cruciate fashion, and discectomy was performed. The target root and interspace were explored to ensure complete decompression of the thecal sac and root sleeve. The wound was then closed in three layers. Postoperative leg pain was assessed using VAS on 3rd postoperative day and 7th postoperative day. Score (0) was considered no pain while score (10) was considered severe most pain. Score in between showed the progressive increase in severity of pain in ascending order. Preoperative and postoperative pain scores were noted and compared.

Results

Out of total 100 patients 74 were male and 26 were female. The age distribution was from 20 to 65 years. Mean age was 38.18 ± 29. Weight of the patients was between 42 to 82 kg with the mean weight of 64.82 kg. MRI revealed most common prolapsed disc at L4-5 levels and L3-4 levels in few.

The mean decrease in VAS leg pain score was 3.72 points (mean preoperative 7.07 to mean postoperative 3.35 at 3rd postoperative day). The mean decrease in VAS leg pain score was 3.87 points (mean preoperative 7.07 to mean postoperative 3.20 at 7th postoperative day). Majority (92%) reported a decrease in greater than 2 points at both 3rd and 7th postoperative days. SLR with 60° or less was considered positive and with more than 60° was considered negative. Patients with positive SLR preoperatively were 95. Postoperatively at 3rd postoperative day SLR was negative in 95 patients and remained positive in 5 patients. At 7th postoperative day SLR was negative in 97 patients and remained persistently positive in 3 patients (Table 1).

Table 1: Pre and Postoperative Straight Leg Raise (SLR) test in patients with sciatica

<table>
<thead>
<tr>
<th></th>
<th>Positive</th>
<th>Negative</th>
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<tbody>
<tr>
<td>Preoperative SLR</td>
<td>95</td>
<td>5</td>
</tr>
<tr>
<td>SLR on 3rd postoperative day</td>
<td>5</td>
<td>95</td>
</tr>
<tr>
<td>SLR on 7th postoperative day</td>
<td>3</td>
<td>97</td>
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</table>

Discussion

Prolapsed intervertebral disc occurs in 5-10% of all the patients who present with backache and it is a common cause of sciatica. Even a small herniated disc in the presence of a slightly narrow spinal canal can lead to significant compression of cauda equina and its nerve roots. Patients in present study had unilateral and single level lumbar disc prolapse who presented with the leg pain radiating along the distribution of sciatic nerve, muscular weakness, wasting, restricted SLR, reflex abnormalities and sensory impairment due to compression of nerve roots.

On the VAS patient indicates pain intensity on a typical day by marking a line from 0-10 corresponding to level of pain. In present study preoperative mean VAS score was 7.07, at 3rd postoperative day mean VAS score was 3.35 and at 7th postoperative day mean VAS was 3.20. A paired t-test when applied for comparison of changes in pain score preoperatively, 3rd post operative day and 7th postoperative day
showed that changes in pain score were statistically significant (p<0.001) which demonstrated a significant reduction in patients perception of pain and improved functional capacity after surgery. On third post operative day difference in pain score of 2 points was found in 8 patients, of 3 points in 31 patients, 4 points in 37 patients, 5 points in 22 patients and of 6 points in 2 patients. On 7th post operative day difference in pain score as compared with the preoperative score was of 2 points in 8 patients, 3 points in 29 patients, 4 points in 36 patients, 5 points in 23 patients and 6 points in 4 patients.

A prospective longitudinal study to assess the clinical outcomes in young active individuals carried out by Dewing CB, et al (2008), where one hundred ninety-seven (197) consecutive single-level lumbar microdiscectomies performed by a single surgeon were prospectively followed over a 3-year period. One hundred eighty-three patients with a mean age of 27.0 years (range 19-46 years) were prospectively followed for a mean of 26 months (range, 12-38 months). Outcomes were assessed using VAS. The mean decrease in VAS leg pain score was 4.7 points (from mean preoperative 7.2 to mean postoperative 2.5); 80% (146) reported a decrease of greater than 2 points. Six patients had recurrent herniations (3%) with 4 of the 6 undergoing additional surgery. Patients with preoperative VAS scores consistent with a preponderance of radicular leg pain versus back pain demonstrated better surgical outcomes in all categories (p < 0.001).13

Conclusions

Procedure of fenestration and open disc excision under direct vision, using microscope offers the complete visualization of nerve root and complete removal of the offending disc along with loose fragments.

References