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Patient's satisfaction after discectomy of lumbar spine through fenestration in lumbar intervertebral disc prolapse using McNab's criteria

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Abstract
Aim: was to evaluate patient's satisfaction after discectomy of lumbar spine through fenestration in lumbar intervertebral disc prolapse using McNab's criteria.
Material and Method: The present prospective longitudinal study was conducted in the Department of Orthopaedic surgery of SRMS-IMS, Bareilly for a period of 18 months from November 2017 to June 2019 among 20 patients having PIVD of Lumber spine and had undergone Fenestration and Discectomy of lumbar spine after obtaining approval from Hospital Ethics Committee. Subjective evaluation was done using McNab'S criteria. All the cases were carefully evaluated preoperatively which included detailed history and examination. All patients were followed at regular intervals of by either OPD visit, at 2 weeks, 4 weeks, 3 months and 6 months. The patient was asked to rate his level of well-being, generally after surgery according to MacNab's outcome assessment of patient satisfaction. The patients choose one of the four: Excellent, Good, Fair and Poor.
Results: The mean age of cases was 41.5±11.19 years with range 23 – 66 years. Maximum number of patients had excellent result (80%), 15% had good and 5% had fair and none of the patients had poor outcome. Superficial wound infection, failed back surgery syndrome, discitis and post-operative ileus was reported among 10%, 5%, 5% and 5% of the subjects respectively.
Conclusion: Good functional recovery has been noted following the surgical procedure of fenestration discectomy. Thus, results of this study states that fenestration technique in PIVD of lumbar spine is a safe.

Keywords: lumbar spine, fenestration, McNab's criteria

Introduction

Disc prolapse commonly occurs in males with a male to female ratio of 2:1, highest prevalence is found to be in the age group of 30- 50 years. Clinically significant radiculopathy due to lumber disc prolapse occur in 4-6% of population [1]. Symptoms and signs constitute sharp pain localized to lower back which increases on walking, standing, coughing and sneezing while decreases with sitting and lying and have radicular pain on straight-leg raising. Patients with disc herniation have pain with forward flexion, whereas patients with spinal stenosis have pain with extension [2].

Neurological features may show muscle weakness later on muscle wasting and diminished reflexes, Sensory loss corresponding to the affected level. Neurological claudication (i.e. bilateral leg pain of nonvascular etiology elicited by walking or prolonged standing), weakness of the lower extremities, and diminished reflexes. Neurological claudication is usually bilateral. Nerve root compression or irritation may also lead to a dermatomal distribution of pain, paresthesia, and numbness. Feature of cauda-equina include Bladder and Bowel Involvement, Perineal numbness, B/L radiculopathy, Lower Limb Weakness, positive Crossed Straight –Leg Raising Sign [3, 4].

Therapeutic treatment can be either conservative or surgical. In surgery, various operative modalities are there i.e. Laminectomy, Hemi-laminectomy and Fenestration [5, 6]. Fenestration is the surgical procedure which is less damaging to the stability of the spine, has a shorter surgical time, less blood loss, lesser incidence of post-operative complications has a shorter convalescence period would be more beneficial and that can be performed at centers like small periphery without any sophisticated instrumentation and approach. In this study we evaluated patients satisfaction after discectomy of lumbar spine through fenestration in lumbar intervertebral disc prolapse using McNab's criteria.

Material and Methods

The present prospective longitudinal study was conducted in the Department of Orthopaedic surgery of SRMS-IMS, Bareilly for a period of 18 months from November 2017 to June 2019 among 20 patients having PIVD of Lumber spine and had undergone Fenestration and Discectomy of lumbar spine after obtaining approval from Hospital Ethics Committee. Subjective evaluation was done using McNab'S criteria. All the cases were carefully evaluated preoperatively which included detailed history and examination. The patients were recruited according to the following inclusion and exclusion criteria:

Inclusion Criteria

Patients with low back pain who failed to respond to

conservative treatment of minimum 6 weeks duration, patients with PIVD who were having neurological deficits and intractable pain and patients with postero-lateral disc protrusion in MRI L-S spine.

Exclusion criteria

Patient having entities i.e. spinal tumor, spinal infection, spinal trauma, degenerative spine disease, metabolic bone disease, pregnancy, other systemic diseases and patients with bladder and bowel involvement (cauda-equina syndrome) were not be included in the study.

Procedure

Patient underwent complete blood picture, LFT, KFT, X-ray (AP and Lateral view in Flexion and Extension) and MRI L-S SPINE. All patients were operated in prone position on bolsters under controlled general anaesthesia. A surgical procedure was carried out with standard procedure of Fenestration technique at surgeon's discretion. A vertical midline incision of 3-4 cm was given after localizing the level of disc under the c-arm. Para spinal muscle were retracted with kobb's retracter and inter laminar space exposed. Only Ligamentum flavum was excised removing only small part of the lamina (laminotomy). Lower 3rd part of upper lamina or upper 3rd of lower lamina was cut to enlarge a fenestration for clear view in case of large disc with the help of kerrison forceps. Thecal sac was retracted using root retractor and after identifying herniated disc it was removed using Disc removing forcep. Adherent part of the disc was not removed. Then using 20ML syringe normal saline is forced through the rent made to clear the space of free fibres of the disc.

Postoperatively patients was allowed sitting on first postoperative day. Gradual walking had to be encouraged but lifting weights, bending and stooping was prohibited for 6-12 weeks. Patients who were heavy labourer or long-distance drivers have to be advised to modify their duties for 6 weeks. All patients had to be advised a regular postoperative back exercise program after 3 weeks. All patients were followed at regular intervals of by either OPD visit, at 2 weeks, 4 weeks, 3 months and 6 months. On follow up patient and his/her relative was enquired about any changes in the posture while walking, increase in the walking distance, improvement in sensation like burning or tingling in lower limb, the motor power, capability to negotiate stairs and sphincter function. Patient was called at 2 weeks after discharge for clinical assessment and suture removal. At every follow up there functional and neurological assessment had been done using MacNab'c criteria.

MacNab's outcome assessment of patient satisfaction

The patient was asked to rate his level of well-being, generally after surgery. The patients choose one of the four: Excellent, Good, Fair and Poor.

Statistical analysis

Data entry was made in MS Office Excel software in codes and analysis was done by SPSS software® version 24. Descriptive statistical analysis, which included frequency, percentages, mean and standard deviation was used to characterize the data.

Results

The mean age of cases was 41.5±11.19 years with range 23 – 66 years. Among the 20 cases three groups were formed i.e. group A: 2 cases (10%) have BMI below 18.5, group B: 17 cases (85%) having BMI between 18.5-24.9 and group C: 1 case (5%) with BMI above 29.9. Among 20 cases 11 cases (55%) have acute onset or less than 12 weeks of duration of symptoms while 9 cases (45%) have more than 12 weeks of onset of duration of symptoms.

The subjective evaluation of the patients satisfaction at the final follow-up when asked about what he thought about the outcome of the surgical procedure was done. The patient was asked choose between excellent, good, fair and poor outcome. Maximum number of patients had excellent result (80%), 15% had good and 5% had fair and none of the patients had poor outcome (table 1).

Complications among the study subjects are shown in table 2. Superficial wound infection, failed back surgery syndrome, discitis and post-operative ileus was reported among 10%, 5%, 5% and 5% of the subjects respectively (table 2).

Table 1: MacNab criteria among the study cases

MacNab criteria	N	%
Excellent	16	80
Good	3	15
Fair	1	5

Table 2: Complications following surgery

Complications	N	%
Superficial Wound Infection	2	10
Failed Back Surgery Syndrome	1	5
Discitis	1	5
Post-Operative Ileus	1	5

Discussion

The origins of disc related sciatica with its clear morphologic and clinical neurologic findings were not recognized until the 20th century. Mixter and Barr [7] in 1934 described disc protrusions and showed the effectiveness of surgery in its management, then there has been an increasing enthusiasm to solve sciatica problems surgically by disc excision [8]. Early surgery is likely to be more cost effective than prolong conservative care. The traditional view has been that wide laminectomy produces increased morbidity compared to less extensive procedures like inter-laminar fenestration. Hence fenestration has been done for all patients in the present study.

Macnab criteria reflect well a surgeon's impression about the surgery's overall success in terms of patient's satisfaction, and how that particular patient should be categorized. The present study showed that maximum number of patients had excellent result (80%), 15% had good and 5% had fair and none of the patients had poor outcome. Mohan Kumar *et al*[8] achieved 86.6% good outcomes and 10% fair outcomes. Pappas *et al*[9] and Davis *et al*. [10] reported 6.4% and 3.3% poor results respectively. Imran BM *et al*. [11] found contradictory results i.e. good outcome in 56.3%, excellent outcome in 35.4% and fair outcome in 8.3% of the subjects.

The average surgical time was 84 minute (54 to 128 minute). The average blood loss was 120 ml during surgery.

Patient was mobilized on second postoperative day with lumbo sacral corset. Two patients developed superficial wound infection at surgical site which was treated with intravenous antibiotic and daily dressing, one case of post-op discitis was treated with bed rest and antibiotics. One patient diagnosed as failed back surgery syndrome was reinvestigated with an MRI LS spine(3T) which showed prolapsed disc on opposite side(right) at same level L5-S1 for which repeat surgery(fenestration) done after 6 months and got relieved from persisting symptoms except motor weakness at EHL(0/5) which did'nt improve till the end of our study. One patient of postoperative ileus recovered with conservative management. Mohan Kumar *et al*. [8] reported low incidence of complications (10%), with one case of superficial wound infection, one case of dural rupture and one case of discitis. Wankhade UG *et al*. [12] found complications in 4 (08%) cases, among them 1 had dural tear while 3 (6%) cases had superficial wound infection.

However, this study has limitations. Our study had short term follow up so we were not in position to comment on long term follow-up of same patients. Also, our study did not provide in depth insight into psychological factors affecting functional outcome of surgery.

Conclusion

The results revealed that maximum number of patients had excellent result (80%), 15% had good and 5% had fair and none of the patients had poor outcome. Good functional recovery has been noted following the surgical procedure of fenestration discectomy. Thus, results of this study states that fenestration technique in PIVD of lumbar spine is a safe, effective and reliable method for treating selected patients with herniated lumbar discs.

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