



A STUDY OF CLINICAL OUTCOME IN THE SURGICAL MANAGEMENT OF PROLAPSED INTERVERTEBRAL DISC IN LUMBAR SPINE.

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ABSTRACT

INTRODUCTION - Low backache is as ancient as mankind. About 90% of people suffer from it at some point in their life. The socioeconomic burden of chronic low back pain is substantial. Surgical management of disc prolapsed is usually considered when the conservative means have been exhausted or in patients with neurological deficits.

AIM - The aim of present research was to study the clinical presentation of IVD, to evaluate the outcome of surgical management by open laminectomy and discectomy and to quantify the results of surgical procedure with other treatment options.

MATERIAL AND METHODS - The study analysed 30 patients reporting to the department of Orthopedics at MMIMSR over a period of two years.

RESULTS AND OBSERVATIONS - 9(30%) patients showed excellent results, 16(53.3%) showed good results, 3(10%) patients showed fair results while only two patients(6.7%) showed poor results.

CONCLUSION - This prospective study concluded that open laminectomy and discectomy has comparable results to Microdiscectomy and foraminotomy as far as subjective and clinical improvement in neurological dysfunction was concerned. Certain variables though showed significant differences.

KEYWORDS : Intervertebral disc prolapse, Laminectomy, Discectomy, Decompression, Neurological deficit.

INTRODUCTION

Low backache is the second most common cause for a medical consultation in the primary care setting and a leading cause of disability worldwide(1). The diagnosis of lowback pain is complex and multifactorial, and a clear etiology responsible for the symptoms is often not detectable.(2)

About 90% of the people suffer from low backache at some point in their life(3). Large majority of these cases recover completely within 3 months(4,5). However, amongst the remaining 10-20% of the patients, less than 50% patients return to their original employment (4,6).

The cost of treatment of chronic backache is substantial, in fact, total health care cost per patient is more than twice as high in patients with chronic backache when compared to age matched controls without chronic low backache(7,8). With advance in recent medicine most of the back pain patients get their MRI done. MRI is a helpful tool in diagnosing PIVD and Lumbar canal stenosis. (9)

Intervertebral disc is made of two components i.e annulus fibrosus and nucleus pulposus. Both these components tend to degenerate as part of normal ageing process. Nucleus pulposus is a gel like highly elastic structure which is responsible for the flexibility of disc and aids to withstand large compressive forces(10,15,18)

Annulus fibrosus is both proprioceptive and nociceptive while nucleus pulposus is not. Pure discogenic pain is only possible when nucleus pulposus disrupts the outer annular fibres(19). Apart from age related degenerative changes, a multitude of factors like genetic factors, vigorous physical activity, trauma, obesity and psychosocial stress are capable of disc degeneration and subsequent herniation (20,21,22). Mixer and Barr first categorised disc herniation into three categories i.e Protrusion(contained), Extrusion(complete/ noncontained) and Sequestration(24).

North American Spine Society has given a working definition of PIVD as "localised displacement of disc material beyond the normal margins of the intervertebral disc space resulting in pain, weakness or numbness in a myotomal or dermatomal distribution(26).

Clinical diagnosis of PIVD need to be further substantiated with

relevant investigations in the form of X- ray, Myelography, CT and MRI scanning. Treatment for the confirmed cases of PIVD is multimodal ranging from guided spinal strengthening exercises, pain relieving medicines to surgical management in cases with neurological deficit.

AIMS & OBJECTIVES - This study aimed to study the clinical presentation of patients with PIVD, evaluate the outcome of surgical management by open laminectomy with discectomy and quantify the results of open laminectomy and discectomy with other treatment options.

MATERIAL & METHODS

This study was conducted on thirty patients admitted in the indoor ward of Orthopedic department at MMIMSR over a period of two years. Patient age ranged from 20-80 years. Patients with structural scoliosis, spondylolisthesis, congenital anomalies, developmental dysplasia, tumors of lower back, cauda equina syndrome and infections of spine were Excluded from this study.

Back pain was assessed clinically with evaluation of radicular symptoms, motor and sensory function evaluation, bladder, bowel function and reflexes. Radiological investigations included routine anteroposterior and lateral views of the lumbosacral spine, MRI and CT scan wherever indicated.

All patients were operated in prone position over Relton and Hall spinal frame through midline longitudinal incision. Skin marking of the affected spinal level was done with pre operative AP and lateral images with C-arm before making an incision. Disc bulge was seen in almost all cases when the affected nerve root was retracted medially. Incision was given over PLL and Annulus fibrosus and disc material was taken out with disc forceps, end plates were curetted gently and loose fragments were taken out with saline wash. Bone wax was used in cases with excess bleeding from excised laminae and spongiosum to control bleeding from epidural venous plexus. Wound was closed after achieving hemostasis over a suction drain. Patient was allowed rolling in bed from the first post operative day. Sutures were taken out at day 14. Lifting, bending and stooping were gradually restarted after 6 weeks. Pre and Post operative evaluation was done with Japanese Orthopedic association low back score. Observations and results were subjected to standard statistical

analysis using SPSS 16 software on windows 8.P values were calculated and values of $p < .05$ were considered significant.

OBSERVATION and RESULTS

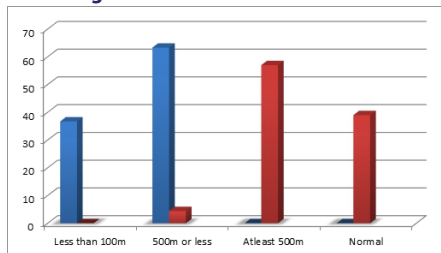
A total of 30 patients were included in this study. Average age of the subjects was 50.96.

years with range of 28-76 years. Majority of the patients were in the age group of 31-40 years. 17(56.7%) were males and 13(43.3%) females. 18(60%) were engaged in occupations demanding heavy weight lifting (Farmers, construction workers).

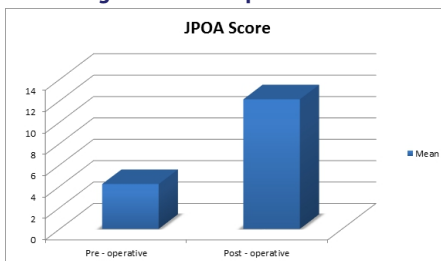
L4-5 level was most frequently involved (14patients, 46.67%) followed by L5-S1 (13patients, 44.33%). 7 patients (23.3%) had severe backache, 16 (53.3%) had occasionally severe while others had mild backache. Claudication distance in most of the patients (19 patients, 63.3%) was less than 500 metres while 11 patients (36.7%) were not even able to walk more than 100 metres.

Pre and post operative SLR, sensory and motor function values (Images above) showed statistically significant difference. Mean time taken for surgery was 103.29 minutes and average blood loss was 88.67ml. Mean post operative hospital stay was 19.77 days. 2 patients had per operative dural tears while 7 patients had post operative urinary retention and one patient had superficial wound infection which required IV antibiotics for 10 days. Mean Pre and post operative Japanese orthopaedic association low backache scores (IMAGE BELOW) were 4.20 and 12.13 respectively with p -value of 0.000 (highly significant).

Graph 1 –Showing Claudication Distance



Graph 2 - Showing Pre and Post Operative JPOA Score.



DISCUSSION

Low back ache is a very common clinical condition. 90% of the people complain of LBA at some point in their life (3). It is the second most leading cause of medical consultation and a leading cause of disability (2).

Low back ache is multifactorial in etiology and prolapsed intervertebral disc is one of the leading cause of LBA. Surgical intervention for IVDP is not new and first laminectomy was performed in 1829 by AG Smith (4). In 1909, Discectomy was performed by Fedor Krause (5).

The studies done by Atlas et al (24), Butterman et al (20) and Weinstein et al (25) compared the management of IVDP by conservative means like Rest, Epidural steroid infiltration and Physiotherapy with that of the surgical management of IVDP. They found that there was a significant improvement in patients treated surgically as compared to those treated surgically. In this study, all

the patients were given a trial of conservative treatment for minimum of 6 weeks. Patients were taken for surgery after conservative treatment failed or patient started having neurological deficit.

There are various treatment options available for disc prolapsed. These include laminectomy, Hemilaminectomy, Microdiscectomy, Laminotomy (fenestration). Present study is based upon open laminectomy and Discectomy. We also compared the results of our surgery with Microdiscectomy and Laminotomy described in other studies with regard to pre, per and post operative variables.

De Palma et al (17) showed 88% improvement in leg and back pain while 50% improvement in sensory and motor functions. Our study showed better results than this study probably due to better patient selection.

The present study included 30 patients of prolapsed intervertebral disc in Lumbar spine. Tycho tullberg et al (19) did laminectomy and discectomy in 30 patients while they managed another 30 patients with Microdiscectomy. Shareef et al (16) performed laminectomy and Discectomy on 55 patients. Sangwan et al (21) performed laminotomy on 26 patients. Deepak et al (22) performed laminotomy on 20 patients. The Mean age of patients in our study was 42 years which is comparable to 43.4 years in study by Shareef et al and 38 years in tycho tullberg et al. In this study, male patients outnumbered the female patients. This can be explained by the fact that more males are involved in occupations demanding strenuous physical labour which is one risk factor for prolapsed intervertebral disc. Shareef et al (16) reported 60% males and 40 % females in their study. Deepak et al (22) reported 70% males and 30 % females in their study.

In the present study, 46.6 % of patients were having L4-5 level disc prolapsed while 43.3% were having disc prolapsed at L5- S1. Spangfort et al (26) reported that L4-5 level disc was more commonly involved as compared to L5-S1 in their study of 2509 patients. Shareef et al (16) reported 54.54% of disc prolapsed at L4-5 level and 41.81% at L5-S1 level. The mean length of incision in our study was 6.28cm. Shareef et al (16) reported mean length of incision as 6.89cm in their study of Laminectomy and discectomy versus 2.99cm incision in cases managed with Microdiscectomy.

The mean blood loss (88.67ml) in our study is comparable to similar studies by Shareef et al (16) (85ml) and Delgado Lopez (8) et al (100ml). However the mean blood loss in Microdiscectomy in the study by Shareef et al was 32ml. In our study, 2 patients (6.7%) had preoperative complication in the form of dural tear. Shareef et al (16) had 7.2 % and 5.7% incidence of dural tears in the open laminectomy and Microdiscectomy group respectively.

In comparing the outcome of surgical management, Sangwan et al (21) had 90% excellent to good results and fair to moderate results in 10%. Deepak et al (22) reported 89% excellent to good, 7.7% fair to moderate and 3.30% poor outcome. Our study showed 83.3% excellent to good results. 10% patients had fair to moderate and 6.66% had poor results.

CONCLUSION

We conclude that surgical procedure is indicated in the patients with failed conservative management. Surgical outcome depends on the patient selection rather than on the type of surgery. On comparing the results, it is found that the outcome of Laminectomy and Discectomy is comparable to the minimally invasive surgeries. Hence, in our opinion, surgery with open laminectomy and discectomy is equally good procedure as compared to other surgical procedures.

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