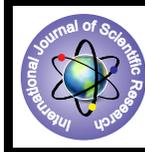


Study of comparison between Anterior V/S Posterior Decompression and various factors affecting surgical outcome of compressive cervical myelopathy



Medical Science

KEYWORDS : CCM, predictive factors, surgical outcome

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ABSTRACT

Introduction: Compressive cervical myelopathy (CCM) is one of the commonest problem for aged patients.

Methods and material: Retrospectively analysed 35 patients for factors affecting outcome of CCM including Age,

Neurology including myelopathy, spasticity, flaccidity, radiculopathy, sphincter involvement, ambulation, dynamic X-rays, MRI (cord changes), single to multiple compressive segments, anterior/posterior or combined pathology, type including spondylotic, flourotic, OPLL. Pre op score including Nurick score and JOA score, types of surgery anterior/posterior/combined and staged with/without fixation and fusion, associated comorbidities.

Result: At minimum of 9-months and average 1-year follow up showed Nurick's grade I pts having Excellent, Grade II & III having good to excellent and Grade IV & V having fair outcome. JOA Score >10 had Excellent and <10 is having good outcome after surgery according to Odom's criteria.

Conclusion: Various factors affect surgical outcome of this problem, which needs thorough assessment and decision making rather than considering single factors.

AIM OF STUDY

- To evaluate the results of different approaches and modalities of treatment in cervical spondylotic myelopathy.
- To evaluate various factors affecting surgical outcome of this problem which needs thorough assessment and helps decision making.

MATERIALS AND METHODS

This is a prospective study of 35 patients with cervical spondylotic myelopathy carried out from 2011 to 2013 in Orthopaedics Department, Civil Hospital Ahmedabad. A complete clinical examination of patients is carried out through a standard Performa.

Out of 42 patient, 7 patients were excluded either due to loss of follow up or inadequate follow up, so 35 patients included for study.

Aim of study: To evaluate the results of different approaches and modalities of treatment in cervical spondylotic myelopathy.

Study level II - Prospective study with 83% follow up.

Study design:

All patients with cervical spondylotic myelopathy were admitted in hospital and treated by different surgeons. Thorough local and neurological examination done as per Performa. Patient is assessed pre-operatively and post-operatively by using NDI (Neck Disability Index), Nurick's grading and JOA score. X-rays cervical spine with lateral flexion extension view was taken. M.R.I was taken in all patients. Plan was decided according to clinical and radiological features. Types of operations are decided by site of pathology, level of pathology & curvature of spine. Operative patient were either discharged on 5th or 6th post operative days after confirming dressing status or were sent to Rehabilitation centre for physiotherapy. All patients were given Philadelphia cervical collar for 6 weeks with isometric neck muscle exercise. Patient was called in follow up on 1 ½ month, 3 month, 6 month and 1 year. Minimum follow up duration is 9 months and average follow up is 1 year. Final outcome is assessed using Odom's Criteria and Percentage Recovery rate of JOA score and improvement in Nurick grade.

OBSERVATION AND RESULTS

Results as per Odom's criteria:

1. Result according to Procedure:

Table 1

Results	Anterior Procedure	Posterior Procedure	Total	Statistics
Excellent	9 (45%)	5 (33%)	14 (40%)	Z value= 0.7 p >0.05
Good	7 (35%)	5 (33%)	12 (34%)	Z value= 0.1 p >0.05
Fair	3 (15%)	4 (27%)	7 (20%)	Z value= 0.9 p >0.05
Poor	1 (5%)	1(7%)	2(6%)	Z= 0.2 p >0.05
Total	20	15	35	

2. According to Pre Operative Nurick's grade:

Table 2

Nurick's Grade	Excellent	Good	Fair	Poor	Total
I	2	-	-	-	2
II	4	4	0	-	8
III	7	3	2	1	13
IV	1	4	5	1	11
V	-	1	-	-	1
Total	14	12	7	2	35

3. According to Pre Operative JOA Score

Table 3

JOA Score	Excellent	Good	Fair	Poor	Total
6-8	2	2	4	1	9
8-10	3	5	1	1	10
10-12	5	3	2	-	10
12-14	-	2	-	-	2
>14	4	-	-	-	4
Total	14	12	7	2	35

4. Final Result according to Odom's criteria:

Table 4

Odom's Criteria	Number Of Patient(n=32)	Percentage
Excellent	14	40%
Good	12	34%
Fair	7	20%
Poor	2	6%
Total	35	100%

DISCUSSION

Cervical spondylotic myelopathy is a disease associated with degenerative changes in cervical spine leading to myelopathic changes in spinal cord and subsequent specific clinical features.

In this study, 35 randomly selected patients were operated by either anterior or posterior surgical procedure, data analysis is done after average 1 year follow up and results were analysed and discussed.

Majority of patients were between the age of 40 to 60 years at the time of presentation, similar to patients in other studies. It is due to starting of degenerative changes, disc protrusion and osteophytes formation and ossification of posterior longitudinal ligament in this age patients with mobile cervical spine region compared to dorsolumbar region.

Most of the patients at the time of primary presentation are having average 6 to 8 months duration of illness with Nurick's grade III or IV and JOA Score between 8 – 10. Due to lack of early diagnosis at primary centres and patient unawareness, we always get patients late in their presentation with average Nurick's grade of III or IV and associated multiple segment involvement.

Anterior pathology (OPLL, Osteophytes, Calcified protruded disc etc.) is a causative factor in majority of cases with cervical spondylotic myelopathy suggests greater incidence of OPLL and disc diseases compared to ligamentum flavum thickening. Anterior discogenic pathology usually affects up to 2 segments but Posterior pathology (ligamentum flavum ossification) usually produces multiple level compressions. In case of OPLL, it produces multiple level anterior pathology but amount of compression is different at each segment.

Number of segments involvement is important for decision making regarding anterior and posterior procedure. Anterior Procedure (Discectomy/Corpectomy with fusion) is performed in patients with anterior pathology and up to 2 segment involvement. In multiple segment involvement and posterior pathology we have preferred posterior procedure. Though majority of patients are having anterior pathology, but all patients were not operated by anterior procedure. The patients with anterior pathology who had multiple segment involvement and lordotic cervical spinal alignment are operated by posterior procedure because lordosis of cervical spine allows drift of spinal cord after laminectomy and decompresses the cord.

Most of the patients with posterior pathology or combined pathology with multiple segment involvement were operated by posterior procedure. In a multiple segment pathology anterior surgery is morbid compared to posterior surgery, so it is better to perform posterior surgery in stable lordotic cervical spine.

Post operative neck pain, stiffness and instability is more commonly associated with posterior procedure due to soft tissue injury, facet arthrosis and multiple segment dissection in this

procedure. C5 radiculopathy is also common with posterior procedure because post operative posterior shifting of spinal cord stretches short C5 nerve roots. Post operative kyphosis is not seen in any patient even up to 3 yrs follow up in some patients, this could be due to proper dissection, repair of muscles (C2 muscle attachment) and ligaments and preserving lateral mass structures during surgery and isometric exercise of neck muscle post operatively. Adjacent segment degeneration is seen more with anterior procedure with non-lordotic curve and fusion at 2 or 3 levels leads to stress load over adjacent upper segment.

Up to 2 level pathology, anterior surgery gives better result compared to posterior surgery because of direct decompression of the cord is achieved, where as in cases of multiple segment pathology less morbid posterior surgery is considered in aged patients to get indirect decompression of the cord. Anterior procedure has 80% excellent to good outcome in most of the patients. While posterior procedure is also having 66% excellent to good outcome in patients. P value is >0.05 in comparing both the procedure. It establishes that both the procedures have similar good to excellent outcome.

Three patients with anterior pathology had fair results; the reason is long duration of symptoms, Nurick's grade IV and focal myelomalacia changes in cervical spinal cord in MRI. Compared to focal myelomalacia changes, diffuse myelomalacia changes have good prognosis.

Early diagnosis and treatment within stage of Nurick's grade I or II and JOA score >10 have excellent outcome. But patient presenting with Nurick's grade III or IV and JOA score <10 have less rewarding outcome after surgery. It suggests that permanent degenerative and myelopathic changes in cord in late presentation have poor outcome. Anterior surgery in patients having up to 2 level pathology gives excellent result compared to multiple level anterior pathology. Posterior surgery results are equivocal in multiple segment disease irrespective to site of pathology.

As per Edward CC (2002) and J. Vaquaro (1982) study posterior surgery gives better results in multiple segment pathology. In our study out of 14 patients having more than 2 segments involvement, 7 (50%) patients have good results by posterior surgery compared to 2 (15%) patients by anterior surgery. This data again suggest that posterior procedure is better in patients with multiple segment involvement.

Study of Anterior procedure done in PGIMER-2009 (n=25) have 80% excellent to good results in patients with up to 2 segment involvement with anterior pathology. In our study also 80% excellent to good results by anterior surgery in patients with up to 2 segment involvement. Similar results are observed in comparing with study of posterior procedure done in AIIMS-2002 (n=34)

In multiple segment pathology posterior surgery is less morbid and gives better results than anterior surgery but up to 2 segments anterior pathology, anterior surgery also gives comparable results.

CONCLUSION

Majority of patients are having Nurick' grade III or IV and JOA Score of 8-10 at the time of presentation. Spasticity, exaggerated reflexes and pathological reflexes, kinetic elements of hand and finger escape sign are present in majority of patients and are useful diagnostic tools. Operative treatment is always having better outcome in all the cases of Cervical Spondylotic Myelopathy patients. Patients with Nurick's grade III or less with JOA score >10 at the time of presentation have better prognosis while Nurick's grade IV or V and JOA score <8 usually have poor prognosis. Focal myelomalacia have a bad prognosis irrespective of type of surgery Anterior surgery shows excellent result with

anterior pathology up to 2 segment involvement. While posterior surgery gives better results in multiple segment involvement irrespective of site of pathology in a normal lordotic cervical spine. Anterior procedure and posterior procedure both are having good outcome if done in properly indicated patients considering the site of pathology, alignment of cervical spine and number of segments involvement.

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