



ISSN: 0975-833X

RESEARCH ARTICLE

STUDY OF FUNCTIONAL OUTCOME OF EARLY VERSUS LATE ANTERIOR CERVICAL DECOMPRESSION AND FUSION FOR DEGENERATIVE CERVICAL SPONDYLOTIC MYELOPATHY WITH MODIFIED JAPANESE ORTHOPEDIC ASSOCIATION SCORE

*Dr. Abdullah Alzahrani, Dr. Mohammad Mahfouz and Mohammad A. Alzahrani

Orthopedic Surgeon, Taif University, Saudi Arabia

ARTICLE INFO

Article History:

Received 24th October, 2016
Received in revised form
19th November, 2016
Accepted 14th December, 2016
Published online 31st January, 2017

Key words:

Cervical myelopathy,
Early surgery,
Late surgery.

ABSTRACT

Objective: To determine functional outcome of anterior cervical decompression and fusion early than 6 months from the symptoms or more than 6 months from the symptoms for degenerative cervical spondylotic myelopathy with modified Japanese orthopedic association score (MJOA).

Materials and Methods: 40 diagnosed cases of one level cervical myelopathy at king abdulaziz hospital in Taif between 2008—2013 were retrospectively analyzed at, 1 year using MJOA.

Results: 20 patients underwent Single level ACDF within 6 months from the start of symptoms with C5-C6 the commonest level to be affected. and 20 patient 20 patients underwent Single level ACDF after more than 6 months from the symptoms but less than one year .The correlation between Duration of Symptoms to Preoperative and postoperative MJOA was statistically significant. We noted statistically significant improvement in symptoms of axial neck pain, radicular arm pain, and gait disturbances post operatively at one year in both groups but was more improvement in group 1. Statically significant difference was noted between the two group while comparison.

Conclusion: Functional outcomes in operated patients at 1-year follow up are better if ACDF surgery is done early within 6 months from the symptoms. Symptoms of axial neck pain; radicular arm pain, clumsy hand and gait disturbances show significant improvement at one year follow up. While bladder and bowel involvement showed the least recovery. Significant improvement in function occurs 1 year postoperatively.

Copyright©2017, Dr. Abdullah Alzahrani et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Citation: Dr. Abdullah Alzahrani, Dr. Mohammad Mahfouz and Mohammad A. Alzahrani, 2017. "Study of Functional Outcome of early versus late Anterior Cervical Decompression and Fusion for Degenerative Cervical Spondylotic Myelopathy with Modified Japanese Orthopedic Association Score", *International Journal of Current Research*, 9, (01), 45803-45805.

INTRODUCTION

Cervical spondylotic myelopathy defined as clinical syndromes arising from a compression of neural structures due to disc herniation, osteophyte formation, hypertrophy of the facet joints and hypertrophy of ligaments. Most of the time the management is conservative treatment, but if it fails, surgical intervention is considered. The aim of surgery is to decompress, stabilize and to restore the alignment of the spine. LaRocca was one of the first to recommended early spinal cord decompression with or without stabilization to stop the progression of the disease for patients presenting with moderate functional disability. (LaRocca, 1988) Common surgical technique includes discectomy without fusion or discectomy with fusion (ACDF) (Ding *et al.*, 2013; Burkhardt *et al.*, 2013; Li *et al.*, 2013; Liu *et al.*, 2012; Basu and Sreeramalingam, 2012; Song *et al.*, 2012; Lin *et al.*, 2012) and corpectomy with fusion (ACCF) (3-5-9-10).

Fusion technique includes use of bone graft or cage and plate. (Gao *et al.*, 2012; Burkhardt *et al.*, 2013) ACDF has confirmed to be beneficial in treatment of cervical myelopathy in both long and short-term follow up (Liu *et al.*, 2014; Yan *et al.*, 2011). In the present study, we have analyzed post-operative functional recovery in patients undergoing early operation within 6 months from the symptoms and late after 6 months from the symptoms anterior cervical decompression and fusion surgery for degenerative cervical spondylotic myelopathy according to 'Modified Japanese Orthopedic Association Scores' (MJOA). On the other hand in case of traumatic cervical cord injury, early surgical intervention show improvement in the result and neurologic return compared to late intervention in cervical spinal cord injured patients (Chagas *et al.*, 2005)

MATERIAL AND METHODS

Study have been in 40 patients diagnosis between january 2006 to april 2011 with clinical and radiological of cervical spondylotic myelopathy of one levels were prospectively

*Corresponding author: Dr. Abdullah Alzahrani
Orthopedic Surgeon, Taif University, Saudi Arabia

analyzed using Modified Japanese Orthopedic Association scoring (MJOA). All cases were operated using anterior approach. Following discectomy autologous tricortical iliac bone graft was used for fusion with plate fixation. MJOA scoring was done pre-operatively and post-operatively at 1 year. Data was collected by direct observations. Radiographs of the cervical spine (Antero posterior and Lateral) and MRI of the spine was done in all cases. Data was analyzed using – McNemar Test: For comparison between preoperative and post-operative symptoms of the two groups at 1 year follow up of axial neck pain, radicular arm pain, gait disturbances and bowel and bladder symptom. For correlation between Duration of symptoms till surgery and Pre-operative MJO. Correlation between Duration of symptoms till and postoperatively MJOA at 1 year, Chi-Square tests (Pearson Chi-Square, Continuity Correction, Fisher’s Exact Test): -For association among the cases between- Number of levels Mann- Whitney test: - For comparison of blood loss and Anesthesia time by number of levels.

RESULTS

The mean age in our study group 1: was 53.2 years with (±9.39 SD) range 30years to 75 years. Out of 20 patients enrolled 12 patients were male and 8 were female. Out of 20 patients, 14 patients presented with signs and symptoms of myelopathy alone while remaining 6 patients had signs and symptoms of myelopathy and radiculopathy. At presentation, 12 patients had mild disability (MJOA 14 and above), 8 patients had moderate disability (MJOA 10 to 13),

The mean age in our study group 2: Was 54.3 years with range 32 years to 76 years. Out of 20 patients enrolled 13 patients were male and 7 were female. Out of 20 patients, 15 patients presented with signs and symptoms of myelopathy alone while remaining 5 patients had signs and symptoms of myelopathy and radiculopathy. At presentation, 13 patients had mild disability (MJOA 14 and above), 7 patients had moderate disability (MJOA 10 to 13).

At one year follow up, group1 17 patients had mild disability (MJOA 14 and above), 3 patients had moderate disability (i.e. MJOA 10 to 13). Group 2: 15 patients had mild disability (MJOA 14 and above) 5 patients had moderate disability (MJOA 10 to 13). The correlation between duration of symptoms (months) to post-operative MJOA scores was statistically significant it is more in group 1 than group 2. This suggests that there was significant improvement after surgery if we operate early within 6 months than late.

One year post operative

	MU	ML	Su	BL	TOTAL
G1	3/5	6/7	2/3	3/3	14 15/18
G1	3/5	5/7	2/3	2/3	6 12/8
G2	4/4	6/4	3/3	3/3	15 16/18
G2	2/5	5/7	2/3	2/3	5 11/18

	MU	ML	SU	BL	TOTAL
G1	4/5	7/7	3/3	3/3	17 16/18
G1	4/5	5/7	2/3	2/3	3 13/18
G2	4/4	6/7	3/3	3/3	15 16/18
G2	3/5	5/7	3/3	3/3	5 12/18

JOA: Japanese Orthopaedic Association score, MU: motor function in the upper extremities, ML: motor function in the lower extremities, SU: sensory function in the upper extremities, BL: bladder function.

DISCUSSION

The management of cervical spondylotic myelopathy continues to be debated due to the inadequacy of information available about natural history of this disorder (Bernard and Whitecloud, 1987; Hukuda et al., 1985). However there is some agreement in literature that a shorter duration of symptoms and milder neurological deficit prior to surgery yields a better post-surgical outcome. And this study support that Successful surgical treatment of cervical myelopathy depend on identifying the specific pathology responsible for clinical syndrome. The surgical approach is then directed to deal with the factors causing the spinal cord compression. In our study, 40 patients of cervical spondylotic myelopathy were treated by anterior cervical decompression and fusion using tricortical iliac bone graft. Majority (60%) of patients presented with symptoms of myelopathy and radiculopathy. C5-C6 levels were most commonly involved in 40% followed by C6-C7 in 20%. Chagas in his article reported C5 to be the most frequently involved vertebral body in spondylotic myelopathy. The correlation between Duration of Symptoms to preoperative and post-operative MJOA scores was significant. Ebersold in his study of 100 cases concluded the only factor related to potential deterioration was the duration of symptoms pre-operatively. Age, severity of disease, number of levels operated, and pre-operative grade were not predictive of outcome (Ebersold et al., 1995). We noted improvement in symptoms of ; radicular arm pain, and gait disturbances at 1 year follow up. r. This suggests that the functional recovery increased significantly patient operated within 6 months from the symptoms. The fusion rate for single level ACDF in our series was 96%.

Conclusion

Anterior cervical decompression and fusion with tricortical iliac bone graft surgery is effective in the treatment of cervical spondylotic myelopathy with one levels affected. From our study it is evident that Duration of symptoms is related to both pre-operative MJOA and post-operative MJOA scores. We recommend early anterior cervical decompression and fusion as soon as the diagnosis of cervical spondylotic myelopathy is made. Functional outcomes in operated patients at 1-year follow up are better if ACDF surgery is done early. Symptoms of axial neck pain radicular arm pain, clumsy hand and gait disturbances show significant improvement at one year follow up following surgery compared to bladder and bowel involvement which showed the least recovery. JOA: Japanese Orthopaedic Association score, MU: motor function in the upper extremities, ML: motor function in the lower extremities, SU: sensory function in the upper extremities, BL: bladder function.

REFERENCES

Basu S, Sreeramalingam R 2012 Adjacent level spondylodiscitis after anterior cervical decompression and fusion. *Indian J Orthop.*, 46: 360-363.
 Bernard TN Jr, Whitecloud TS 3rd 1987 Cervical spondylotic myelopathy and myeloradiculopathy. Anterior decompression and stabilization with autogenous fibula

- strut graft. *ClinOrthopRelatRes.*, 149-160.
- Bolesta MJ,Rechtine GR 2nd, Chrin AM 2002. One- and two-level anterior cervical discectomy and fusion: The effect of plate fixation. *Spine J.*, 2: 197-203.
- Burkhardt JK, Mannion AF, Marbacher S, Dolp PA, Fekete TF, *et al.* 2013. A comparative effectiveness study of patient-rated and radiographic outcome after 2 types of decompression with fusion for spondylotic myelopathy: anterior cervical discectomy versus corpectomy. *Neurosurg Focus*, 35: E4.
- Burkhardt JK, Mannion AF, Marbacher S,Dolp PA, Fekete TF, *et al.* 2013 A comparative effectiveness study of patient-rated and radiographic outcome after 2 types of decompression with fusion for spondylotic myelopathy: anterior cervical discectomy versus corpectomy. *Neurosurg Focus.*, 35:E4.
- Chagas H, Domingues F, Aversa A, Vidal Fonseca AL, de Souza JM 2005. Cervical spondylotic myelopathy: 10 years of prospective outcome analysis of anterior decompression and fusion. *SurgNeurol.*, 64 Suppl 1: S1:30-35.
- Ding C, Hong Y, Liu H, and Shi R, Song Y, *et al.* 2013. Comparison of cervical disc arthroplasty with anterior cervical discectomy and fusion for the treatment of cervical spondylotic myelopathy. *ActaOrthopBelg.*, 79: 338-346.
- Ebersold MJ, Pare MC, Quast LM 1995. Surgical treatment for cervical spondylitic myelopathy. *J Neurosurg.*, 82: 745-751.
- Gao R, Yang L, Chen H, Liu Y, Liang L, *et al.* 2012. Long term results of anterior corpectomy and fusion for cervical spondylotic myelopathy. *PLoS One* 7: e34811.
- Hukuda S, Mochizuki T, Ogata M, Shichikawa K, Shimomura Y. 1985. Operations for cervical spondylotic myelopathy. A comparison of the results of anterior and posterior procedures. *J Bone Joint Surg Br.*, 67: 609-615.
- LaRocca H. 1988. Cervicalspondylotic myelopathy: *natural history*. *Spine Phila Pa.*, 1976 13: 854-855.
- Li J, Zheng Q, Guo X, Zeng X, Zou Z, *et al.* 2013. Anterior surgical options for the treatment of cervical spondylotic myelopathy in a long-term follow-up study. *Arch Orthop Trauma Surg.*, 133: 745-751.
- Lin Q, Zhou X, Wang X, Cao P, Tsai N, *et al.* 2012 A comparison of anterior cervical discectomy and corpectomy in patients with multilevel cervical spondylotic myelopathy. *Eur Spine J.*, 21: 474-481.
- Liu X, Min S, Zhang H, Zhou Z, Wang H, *et al.* 2014. Anteriorcorpectomy versus posterior laminoplasty for multilevel cervical myelopathy: a systematic review and meta-analysis. *Eur Spine J.*, 23: 362-372.
- Liu Y,Hou Y, Yang L, Chen H, Wang X, *et al.* 2012. Comparison of 3 reconstructive techniques in the surgical management of multilevel cervical spondylotic myelopathy. *Spine (Phila Pa 1976)* 37: E1450-1458.
- Mummaneni PV, Kaiser MG, Matz PG, Anderson PA, Groff MW, *et al.* 2009. Cervical surgical techniques for the treatment of cervical spondylotic myelopathy. *J Neurosurg Spine*, 11:130-141.
- Song KJ, Lee KB, Song JH 2012 Efficacy of multilevel anterior cervical discectomy and fusion versus corpectomy and fusion for multilevel cervical spondylotic myelopathy: a minimum 5-year follow-up study. *Eur Spine J.*, 21: 1551-1557.
- Wen ZQ, Du JY, Ling ZH, Xu HD, Lin XJ 2015. Anterior cervical discectomy and fusion versus anterior cervical corpectomy and fusion in the treatment of multilevel cervical spondylotic myelopathy: systematic review and a meta-analysis. *TherClin Risk Manag.*, 11:161-170.
- Yan D, Wang Z, Deng S, Li J, Soo C 2011 Anterior corpectomy and reconstruction with titanium mesh cage and dynamic cervical plate for cervical spondylotic myelopathy in elderly osteoporosis patients. *ArchOrthop Trauma Surg.*, 131:1369-1374.
