

Cervical Spondylosis, Surgical Management and Outcome

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Summary:

Background: Cervical spondylosis is a degenerative disease of the cervical spine and can occur at any age but mostly after 5th decade.

Objectives: is to focus a light on the clinical features, radiological findings and the result of the surgical treatment with comparison to the global results in the same field.

Patients and method: This is a prospective study of 50 patients with cervical spondylosis managed with surgery at surgical specialty hospital in the medical city, Baghdad, from the period from Jun. 2011 till Jan. 2012. The clinical, radiological, neurophysiological studies together with surgical outcome were all reviewed and included in the study.

Results: Patients were divided into two age groups; those below 50 years had their disease mostly of traumatic cause and their presentations were mostly of motor dysfunctions. Older patients had the disease process of degenerative cause and much slower progress and they were mostly complaining of sensory problems.

Conclusions: Early surgery was the most beneficial in both groups, and bearded less morbidity to the patients.

Keywords: Cervical spondylosis. Dysphagia. Vertigo. Osteophytes. Myelopathy. Laminectomy and Corpectomy.

J Fac Med Baghdad
2013; Vol.55, No. 4
Received Oct. 2013
Accepted Nov. 2013

Introduction:

Spondylosis Describes degenerative spinal changes due to osteoarthritis, it affects the vertebrae, intervertebral discs and the surrounding ligaments and connective tissue, sometimes with pain or paresthesia radiating down to the limbs as a result of pressure on the nerve roots (1). Spondylosis is the most common cause of cervical radiculopathy and myelopathy in patients older than 50 years of age. Although cervical spondylosis is figured out in the early human records; but, it's pathology, epidemiology and etiology were not known until the nineteenth century. Until the early twentieth century, the treatment was supportive, and surgeons were reluctant for aggressive approaches because the fundamental mechanism and the pathological changes associated with the disorder are still poorly defined. VICTOR HORSLEY performed the first decompressive operation in 1901 for a patient with progressive myelopathy (2). The spondylotic process represents a spectrum of degenerative changes involving the intervertebral discs, the vertebral bodies, ligaments and radicular arteries that result in the prolapsing discs, formation of osteophytes or ligamentum flavum thickening (3 and 4). The intervertebral discs prolapses either centrally, laterally or in both positions; clinically, the cord may suffer from complete functional transection, lateral cord, Brown Séguard syndrome or the anterior spinal artery syndrome. Cervical spondylosis with radiculopathy; occurs acutely or insidiously from root compression by spondylotic osteophytes, Precipitated by trauma, and it is usually unilateral. Pain and weakness are typical, but one may exist without the other. MYELOPATHIC CERVICAL SPONDYLOSIS;

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similar to central cord syndrome and they occur episodically, insidiously, and usually preceded by acute hyperextension trauma.

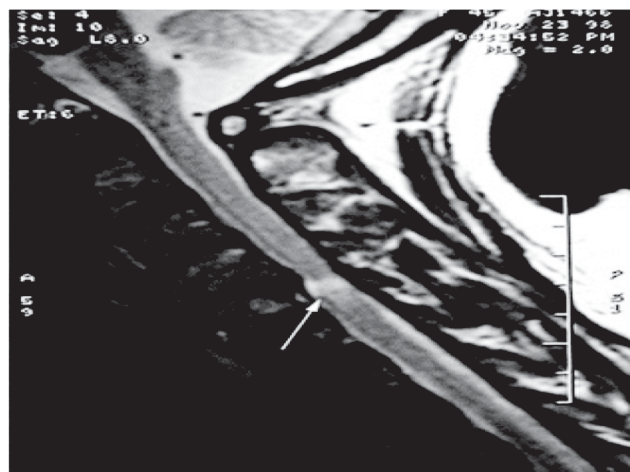


Figure 1. Cervical Myelopathy (5)

MRI is now the main diagnostic procedure used for diagnosis and follow up of patients with cervical spondylosis. Other means of cervical imaging include; cervical computerized tomography, Röntgenography, and myelography or CT myelography. Not all patients with radiological evidence of spondylosis have cervical cord involvement in the disease process (6 and 7). Amyotrophic lateral sclerosis, spinal cord tumor and / or demyelinating diseases are all included in the differential diagnosis together with peripheral nerve

diseases. Electromyography and Nerve conduction study, are useful for confirmative (6) diagnosis and differentiation of central cause's then peripheral neuropathy. The exact level of involvement can be ascertained when multiple level are involved with compressive process. The surgical management of cervical spondylosis has evolved significantly over the past several decades. Initially, laminectomy was the sole option for decompressing the cervical spinal cord and nerve roots, despite the fact that cervical spondylosis-induced epidural compression most frequently occurred anterior to the neural elements. This limitation may have resulted in less than optimum clinical outcomes because of incomplete decompression of the neural elements. Other forms of surgical management include anterior discectomy with or without fixation for single or multiple levels, partial median corpectomy for multiple levels and fixation either anteriorly or posteriorly(8, 9 and 10).

Patients and Methods:

This is a prospective study of 50 patients with cervical spondylosis and their follow up from Jun 2011 to Jan 2012. A special formula used to divide the patients according to their age, gender, clinical, neurological findings, radiological examinations, preoperative changes and postoperative course. All patients were complaining of neck stiffness and pain in the shoulders, back of the head and the upper limbs; few of them had gait problems, and others complained of positive or negative sensory problems in the upper limbs. Patients were evaluated clinically and neurologically with a special attention to their cervical problem. All patients had radiological evidences of spondylosis. All patients with traumatic or neoplastic causes of cervical cord disease were excluded from the study together with those patients with peripheral nerve diseases. MRI was the main diagnostic procedure and it is used at least once with most of the patients. Those with doubtful results were sent for neurophysiologic studies. The results of the clinical, radiological and physiological examinations were analyzed and the patients were informed of their real problem and a plan of management was designed for each patient individually. Initial management involved a short course of non-operative "conservative" treatment, including stabilization with Philadelphia collar, muscle relaxants, neurotonics and neurostimulants and analgesics with steroids. Patients with good response to non-operative management were continued on that course furthermore; those patients with poor response to this initial therapy, or those with late loss of response, all were allocated to more aggressive management plans. Operative approaches varied from anterior discectomy with or without fusion for either a single level or multiple levels, to posterior decompression. No attempt was made for anterior corpectomy or posterior fixation. Postoperative period involved hospital stay for at least 3 to 7 days, Antibiotic cover for 10 to 14 days, with analgesia and neurotonics for elderly patients. Cervical collar was used for 6 weeks to 3 months according to the type of the operation adopted. MRI of the spine was done within the first 10 days postoperatively up to 3 to 6 months; if there were any problems related to pain of

paresthesia. Physiotherapy started as early as within the first few days. Moreover, all patients were followed up for at least 6 months.

Results:

While analyzing the onset of the disease; 13 males and one female were under the age of 50; mean age was 45, were found to have acute onset of symptoms, with a positive history of trauma in 11 patients. Older patients, 23 males and 13 females; mean age was 60 years, were found to have a chronic history of headache, which is also common among younger patients and shoulder pain in 15 (30%) of the patients, figure 1. Peripheral sensory symptoms were found to be radicular pain among 25 (50%) of the patients, 10 of them were young. Paresthesia 12 (24%), numbness 16 (32%) and weakness in 5 (10%) were more common among older patients. In addition, symptoms related to vertigo were seen in one patient (2%), and dysphagia in 3 (6%) patients. Older patients were found to have symptoms related to motor system more than younger patients were sensory symptoms are more. None of the patients had symptoms related to sphincter dysfunction. On examination, table 1; none of the patients under the age of 50 were found to have wasting of muscle, versus 4 patients (8%) of the older patients had muscle wasting and one patient (2%) found to have fasciculation's, also proved by surface EMG. Gait disturbances were observed in 3 (6%) patients. The frequently observed MRI changes, table 2: Canal stenosis from facet joint hypertrophy or ligamentum flavum thickening was the most frequent findings; 22 and 20 (44% and 40%) patients respectively. While disc prolapse either central 6 (12%) patients, lateral 5 (10%) patients or Centro lateral 15 (30%) patients was the next common finding. Sometimes patients may have all the above changes. Myelopathy observed in three patients 6 (12%). The type of surgery and the response to surgery were found to be as shown in table 3. Laminectomy was done in 39 (78%) of the patients for either spinal canal stenosis or thickened ligamentum flavum, with good response in 30 (60%) of the patients. Anterior discectomy without fixation was performed for 8 (16%) patients, and the response was good in 7 (14%) patients and fixation was done for only 3 (6%) patient with 100% success. The best results were obtained by anterior discectomy with cage fixation for a single level disc. Over all the Post-operative results were good for 40 (80%) patients, while fair for 10 patients, 20%. In the postoperative period; none of the patient had problems related to wound infection or wound dehiscence.

Table 1 Clinical Presentation of Patients with Cervical Spondylosis

Clinical Feature	Young	Old
Headache	15 (30%)	
Numbness	1 (2%)	15 (30%)
Unilateral Radicular pain	2 (4%)	12 (24%)
Bilateral Radicular pain	8 (16%)	3 (6%)
Paresthesia	2 (4%)	10 (20%)
Bilateral Shoulder Pain	3 (6%)	6 (12%)
Unilateral Shoulder Pain	1 (2%)	5 (10%)
Weakness	1 (2%)	4 (8%)
Muscle wasting	0	4 (8%)
Dysphagia	0	3 (6%)
Gait disturbance	0	3 (6%)
fasciculation's	0	1 (2%)
Vertigo	0	1 (2%)
Sphincter Dysfunction	0	0

Table (2) MRI Findings.

MRI Finding	NO.
Ligamentum Flavum hypertrophy	22 (44%)
Facet Joint hypertrophy	20 (40%)
Centro lateral disc prolapse	15 (30%)
Central disc Prolapse	6 (12%)
Myelopathy	6 (12%)
Lateral disc prolapse	5 (10%)

Table (3) Surgical Procedures and response to surgery.

Procedure	No. Patient	Response	
		Good	Fair
Laminectomy	39	30 (60%)	9 (18%)
Anterior Discectomy without Fixation	8	7 (14%)	1 (2%)
Anterior Discectomy With Fixation	3	3 (6%)	0

Discussion:

As cervical spondylosis is a degenerative disease, it is expected to be seen among elderly, 50 – 70 years population. Although, some people were younger than this age group; their probable presentation was not degenerative, but prolapsing disc. For the latter to present, there should be an even a trivial trauma that patient couldn't remember. 13 patients (26%) below 50 years, mostly male, 12 (24%), has a short history, few weeks, of mostly sensory symptoms in a unilateral radicular pattern, radicular pain in 8 (16%) and shoulder pain in 3 (6%). This is related to the daily activities and trauma that most people sustain. Radiologically, those patients had mostly lateral disc prolapse, mostly at C4 – 7 levels due to hypermobility at these levels and weakness of the posterior longitudinal ligament in the lateral margins. There were no myelopathic changes found in the MRI studies among this group for their symptoms were so acute and those patients were managed mostly surgically.

The post-operative results were very good, and these results agree with global studies (6, 7, 8 and 9). Older patients presented with a prolonged history, many years, of head and neck pain among 15 (30 %) patients for each and shoulder pain among 11 (22 %) patients, since they have pressure on the upper cervical roots C3 – 5, of degenerative causes. Radicular pain is mostly bilateral 6 (12 %), but unilateral presentation is more than those in the younger age group, this is due to the slowly degenerative process. Motor symptoms were rare and only seen in very advanced cases with prolonged history, 3 (6 %) of our patients; most patients seek medical care earlier when there are only sensory symptoms (7), also did our patients. Fasciculation's precedes wasting by many months; motor disturbances in the lower limbs were noticed in only a single patient (2 %); and his radiological findings revealed myelopathy (8) at different sites. This partially due to neglectation of the condition by the patient or prolonged non-operative management with poor response (9) and so did this patient.

Although dysphagia; figure 1, and cervical spondylosis are both common presenting problems, they are often not related. Only 3 (6%) of our patients had dysphagia, and their spondylosis was in an advanced stages, and this agree with other reports. In these patients pressure of solid food on the osteophytes is probably induces pain and cricopharyngeal spasm. Three cases were presented and it is suggested that this condition should be looked for in all elderly patients with advanced cervical spondylosis (10 and 11). Spondylotic changes in the cervical region are traditionally known to cause vertigo (12), but only one single patient had vertigo in our series. The mechanism by which cervical vertigo was induced is very debatable. Vertigo per se, because of vertebrobasilar arterial insufficiency is not a common finding in cervical spondylosis, due to most of the spondylotic changes is unilateral and the blood flow in the opposite side will suffice the supply of the brain stem and pons. Probably, vertigo may coexist with cervical spondylosis, but rarely caused by it (13 and 14). All of our patients were involved in the surgical management of their condition, although some of them 16 (32%) patients, especially the elderly patients had an initial response for non-operative this also goes with Anita et al (15). Hodges et al (16) recommended for at least a single short course of immobilization and steroids before proceeding to a more aggressive approach. The results of surgery was 100% successful in 3 (6%) patients whom had anterior discectomy with fixation for a single level of herniated disc, other researchers, like Rick Bhasin et al were found this is more accurate. Our best results were gained from decompressive laminectomy for spinal canal stenosis from either hypertrophied ligamentum flavum; it was done in 20 (40%) patients, good in 14 (28%), fair in 4 (8%) and no changes in 2 (4%) patients, or facet joint hypertrophy; good in 15 (30%) and fair in 7 (14%) patients (17 and 18). Anterior discectomy without fixation was performed in 8 (16%) patients; 5 (10%) patients good, 1 (2%) fair and 2 (4%) patients with no changes. We adopted the posterior approach for it is more popular and our practice in this type of operations is much more than in the anterior approaches. No attempts were made to remove the

prolapsed discs from behind.

Less favorable results were found among patients with myelopathy; good in one (2%) and fair in two (4%) patients, especially when presented at advanced stages, when the changes were irreversible, this also supported by Thomas M. Wascher (19), who noticed a very slow improvement over a period that exceeds one year.

Conclusion:

Cervical spondylosis is more frequent at levels from C5 to C7. Trauma may predispose or exacerbates the already existing cervical spondylosis. Acute disc disease occurs commonly unilaterally and among patients below 50 years of age. Long track signs occur only in severe cases of cervical spondylosis. Dysphagia is uncommon symptom of cervical spondylosis. Vertigo is rare in cervical spondylosis. Autonomic dysfunctions are hardly to be associated with cervical spondylosis.

Recommendations:

The use of neurophysiological study of the nerve functions is valuable when there is any query in the clinical and radiological presentation. Use Philadelphia type collar instead of other types of collars for cervical immobilization in the pre- and postoperative period. Conservative therapy for a long time is not recommended.

Try to use more advance technique in the surgical approach to cervical spondylosis

Author contributions: Authors had full access to all data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis. Study concept and design: Emad Sadik Abbas. Acquisition of data: Yuksel Yashar Mohammad. Analysis and interpretation of data: Yuksel Yashar Mohammad. Critical revision of the manuscript for the important intellectual content: Emad Sadik Abbas.

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