

Rheumatoid Arthritis Of The Cervical Spine

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Abstract

70 patients with rheumatoid arthritis of at least two years duration, were assessed clinically and radiologically for cervical spine involvement. Cervical spine involvement was found radiologically in 64 % cases and clinically in 57 % cases. Atlantoaxial subluxation in 8 , subaxial subluxation in 24 and basilar invagination in 2 patients was present. Though subluxations were common, neurological symptoms were present in only 8 out of total 70 patients studied. Atlantoaxial instability, and presence of neurologic deficit were indication for surgery which may be also be required in seemingly asymptomatic patients to prevent life threatening instabilities and irreversible damage t nervous tissue.

INTRODUCTION

Cervical spine involvement in rheumatoid arthritis is frequent and is next to hand and feet involvement in terms of frequency¹. The disease start from hyperactive inflammatory synovium that causes ligamentous destruction, subsequent hypermobility and mechanical degeneration resulting into atlantoaxial subluxation, subaxial subluxation and basilar invagination which may result in irreversible neurological damage^{1,2,3}. The present study was undertaken to study the pattern of involvement of cervical spine and its management in rheumatoid arthritis patients at our institute.

MATERIAL AND METHODS

Patients with established rheumatoid arthritis of at least two years duration, who attended OPD from 1st January 2004 to 31st December 2004, were included in this study. Patients having history of significant trauma to neck were excluded. Radiological and clinical evaluation of these patients was undertaken.

Patients were evaluated for neck pain and neurological status. It may be difficult to assess exact muscle power in presence of severe polyarticular disease.

Radiological examination of cervical spine in form of antero-posterior and profile bending X-rays of the cervical spine were undertaken. They were observed for :

1. Anterior atlanto-dense interval(ADI).
2. Sub axial subluxations (SAS)

3. Disk space narrowing.

4. Facet joints

Any other abnormality.

A total of 70 patients were included in this study. According to clinical presentation the group was divided into groups having painful neck and asymptomatic neck.

Medical management was in the form of NSAIDS, disease modifying drugs, local heat, neck exercises and intermittent use of cervical collar. Indications for surgical intervention were presence of neurological deficit, severe pain and anterior atlanto-dense interval of more than 5mm.

RESULTS

There were total 70 patients (62 females and 8 males) in our study with average age of 39.5 years(24-54 years). The mean duration of disease is 6.5 years (2-20 years).

Figure 1

TOTAL PATIENTS	PAINFUL NECK	ASYMPTOMATIC NECK
70	40	30
Average Diseases Duration	7.6 yrs	3.5yrs
6.5yrs		
Average age	42 yrs	34 yrs
39.5yrs		

Figure 2

RADIOLOGICAL FINDINGS

Anterior ADI	4.75 mm	3.0mm
Multiple subluxation	20	04
Atlanto-axial subluxation	07	01
Disc space narrowing	22	05
Basilar Invagination	02	-

Figure 3

CLINICAL PRESENTATION

1. Neck pain	24
2. Occipital pain	15
3. Radiculopathy	05
4. Myelopathy (varying degree of neuro-deficit, weakness in extremities)	03
5. Sensation of falling of head	04
6. Lhermite Phenomenon	01
7. Vertebro Basilar insufficiency	02
8. Without neck pain	25

(The collective number is higher as more than one presentation was present in some patients).

Majority(62) of the patients were managed conservatively. Surgical intervention was required in 8 patients. In total 9 procedures were done in 8 patients.

Surgical procedures undertaken were:

1. Transarticular C1-C2 screw fixation 04
2. Cervico-Occipital fusion 02
3. Laminectomy with lateral mass plating 02
4. Anterior Decompression 01

Average age of these patients is 47 years and average disease period is 13 years (10-18 years). Bony fusion could be achieved in all these patients. Implant removal was necessitated in one patient in whom the anterior H plate became loose and was causing difficulty in deglutition. Two patients with anterior atlanto-dens interval of more than 5mm have refused surgery.

The patients who were not stabilized are being watched for progression of instability and appearance of any neurological sign indicating compression of cord.

DISCUSSION

Rheumatoid arthritis prevalence is estimated to be 1%-2% in the population¹. Garrod first reported rheumatoid involvement of cervical spine in 1890. He reported

involvement in 36% of his cases². Other authors have reported 19%-71% involvement of cervical spine in patients with rheumatoid arthritis^{2,3,4,5,6}. 64% of our patients with rheumatoid arthritis had cervical spine involvement. Pain neck and sub-occipital pain were the commonest presentations followed by radiculopathy and myelopathy. 40% to 85% of patients with rheumatoid arthritis have neck pain^{3,6}. 57% of patients in our study had neck pains. The patients without neck pain have lower age (34 years) and lesser duration of disease (3.5 years). Neurological symptoms are reported to occur in 5%-67% cases^{3,4}. In this study 8 patients (11%) had neurological symptoms.

Multiple subluxations is the commonest radiological presentation, being present in 22 out of 45 painful necks and 4 out of 25 painless necks. These subluxations give a step-ladder pattern. Displacement in painless group was less than the group with painful necks.

Atlanto-axial instability is because of destruction of transverse atlantal and alar ligaments and joint capsule^{1,7}. Normal ADI (Atlanto-dens interval) is 3mm or less and posterior ADI is 14mm or more³. Atlanto-axial subluxation is reported to occur in 5%-52% of patients in first decade of diagnosis^{4,6,7,8}. In this study it is 11% and with increase in disease duration, this may increase. All patients in this series had anterior atlanto-axial subluxations whereas, lateral and posterior subluxations have also been reported². Patients with anterior ADI more than 5mm were taken for stabilization. All the patients where stabilization was done had a disease history of more than 10 years. Papadopoulos stated that as the disease duration increases the subluxations are bound to progress and new subluxations may appear, and operative treatment should be considered before the onset of neurological symptoms⁴.

The aim of spinal stabilization and fusion in rheumatoid arthritis patients with unstable cervical spine is to prevent neurological compromise and to decrease pain^{7,8}. 8 out of 70 patients in our series required surgical intervention. 4 were operated for atlanto-axial subluxations and were stabilized with posterior transarticular C1-C2 screws and bone graft. Good bony fusion could be achieved in 12 weeks in all of these patients. This procedure is superior to Gallies / Brooks fusion as it provides three point fixation and stability in all planes (rotational, translational & flexion-extension)^{8,9,10}.

In 2 patients laminectomy with lateral mass plating was done. In 2 patients occipito-cervical fusion was undertaken. In one of these patients, because of associated compression

at C4 to C6, anterior decompression and stabilization was also done. Of the 3 patients with compressive myelopathy, two are showing recovery. 3 patients with C2 radiculopathy and 2 patients with C5 radiculopathy have recovered. One patient of myelopathy did not show significant recovery in which vascular reasons can be attributed to the cause of myelopathy. Myelopathy due to vascular cause does not reverse after decompression¹¹.

Once neurological symptoms appear, early surgical intervention is mandatory before irreversible neurological changes occur(ref). Rheumatoid cervical lesions do not always progress, and the presence of radiological abnormality does not always mean neurological deterioration¹². The challenge in treating patients with cervical rheumatoid arthritis is to predict accurately which asymptomatic patients are at the risk of getting neurological complications³.

As for neurological symptoms, vascular causes are also responsible and decompression may not reverse the changes once neurological symptoms have appeared. It is better to intervene before the neurological symptoms appear rather than to expect reversal of symptoms, which may not occur completely owing to vascular reasons¹¹.

Periodic radiographic evaluation and watching for increase in anterior atlanto-dense interval or decrease in posterior atlanto-dense interval need to be considered for fixation after a critical level which is 5mm and 14mm respectively. Hiraizumi et al mentioned increased ROM of the atlantoaxial joint and an increase in the number of irregular facets as other factors predictive of progression of atlantoaxial instability¹².

Progression of subluxations over time is typical but rate and extent of progression is unpredictable. Factors such as mobility of adjacent vertebrae, irregular vertebral endplates and facets, vertebral collapse, and ankylosing change in the adjacent vertebrae are likely to hasten the progress of subaxial subluxations¹². Long duration of the disease is associated with more destruction. In a follow-up study Smith et al. has shown that in 40% of their patients had radiological progression of subluxations over a period of 4½ years¹³.

Being on steroids or disease modifying agents which predisposes patient to osteoporosis, making the choice of fixation and implant of an unstable segment difficult as implant cutout is common because of poor purchase. In our study, screws of anterior plate in one patient got loose

making implant removal necessary. Because of this reason the surgery if required, needs to be performed early before the bones become too osteoporotic to hold an implant. Sacrificing neck mobility after cervical fusion in disabled RA patients with multiple joint involvement means the loss of ability to perform postural changes and to keep a sitting balance¹².

CONCLUSION

Involvement of cervical spine is common in patients with rheumatoid arthritis. Although majority of the cases can be managed conservatively, surgical intervention is required, once neurological symptoms has appeared or if life threatening instability is there. One should closely follow radiological and clinical findings so as to decide whether to continue conservative treatment or opt for cervical fusion. Surgery if required should be done early because neurological impairment may become irreversible. Also, surgery in advanced disease may be difficult because of poor bone stock and risk of poor wound healing

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