Case report

Basilar invagination due to rheumatoid spondylitis of servical spine

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Introduction

Basilar invagination is a rare congenital or acquired craniocervical junction abnormality where the tip of the odontoid process projects above the foramen magnum. We report a patient with cervical cord compression due to basilar invagination caused by rheumatoid arthritis.

Case report

A 73-year-old female with rheumatoid arthritis developed insidiously progressive difficulty in walking over a year. She noticed weakness of upper limbs and retention of urine 6 months prior to admission. She had an emergency tracheostomy at the age of 64 years following stridor caused by bilateral arytenoid fixation due to rheumatoid arthritis.

There were no cranial nerve abnormalities. She had spastic quadriparesis with predominant left lower limb weakness and was unable to walk unaided. There was no sensory level. She had an indwelling catheter. She had evidence of asymmetrical oligoarthritis with deformities in her right hand.

Her ESR was 52 mm in the 1st hour, CRP, rheumatoid factor titres were normal. Cyclic citrullinated peptide (CCP) antibody titre was raised at 148.2 U/ml (normal range 0-5). CT of the cervical spine showed atlanto-axial subluxation with vertical displacement of the odontoid process leading to basilar invagination (Figure 1, see discussion below). Erosive changes were noted in the odontoid process and apophysial joint at C1/C2. Magnetic Resonance Imaging of the cranio-cervical region showed cervical cord compression at the foramen magnum (Figure 2). There was no evidence of myelomalacia, Klippel-Feil anomaly, syringomyelia or hydrocephalus on neuroimaging. She underwent posterior decompression and occipito-cervical stabilisation with screw fixation at C3-C5 after thorough pre-operative evaluation (Figure 3). Post-operatively, she underwent physiotherapy and was able to be mobilised with minor support.

Discussion

The prevalence of cervical spine involvement in rheumatoid arthritis (rheumatoid spondylitis) ranges from 25% to 80%, depending on the diagnostic criteria

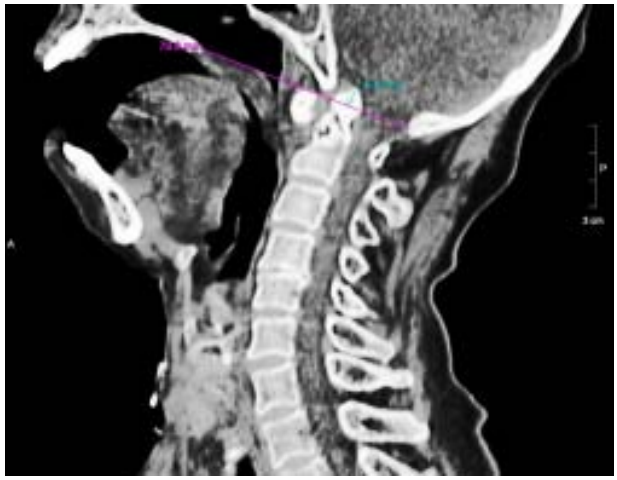

Figure 1. Reconstructed sagittal CT, cranio vertebral region: atlanto-axial subluxation with vertical displacement of the odontoid process 6.8mm above Chamberlain's line.

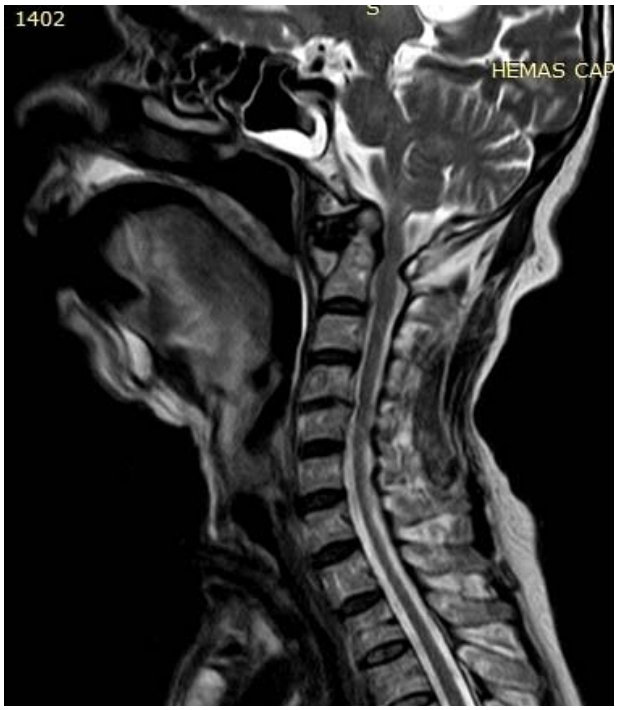

Figure 2. MRI (T2 weighted) of cranio vertebral region: cervical cord compression at foramen magnum.

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Figure 3. Lateral radiograph of cervical spine: occipito-cervical stabilisation with screw fixation at C3 to C5 levels.

applied[1]. However, only 7-34% of patients with rheumatoid arthritis have a neurologic deficit. The three major abnormalities which cause neurologic deficit include atlanto-axial subluxation (49%), basilar invagination (38%) and sub-axial subluxation (10-20%). Basilar invagination (also referred to as basilar impression, superior migration of the odontoid or cranial settling) is attributed to erosion and bone loss in the occipito-atlantal and atlanto-axial joints[2].

Radiological evidence of rheumatoid spondylitis may be present in asymptomatic patients. Compression of C2 sensory fibres can present with pain in the face or ear or as occipital neuralgia. Progressive radiculo-myelopathy and/or medullar compression may occur in advanced stages of the disease.

Diagnosis is established by demonstration of the odontoid tip at an abnormally higher level on plain radiography or CT of cervical spine. Usually the odontoid tip lies at or below a line extending from the posterior margin of the hard palate to the posterior edge of the foramen magnum (Chamberlain's line). Basilar invagination is generally considered present if the elevation is greater than 5 mm[3,4]. In this patient the odontoid tip was 6.8 mm above the Chamberlain's line (Figure 2). MRI of brain and cranio-cervical region is required to confirm/exclude cervical cord and brain stem compression.

Surgical intervention is indicated especially in the presence of neurological impairment or with radiological changes alone to prevent neurological disability. Cervical traction is sometimes used pre-operatively. If basilar invagination is reducible, it may be possible to treat with a posterior-only surgical approach, including decompression and fusion. Basilar invagination that is not reducible is treated with anterior decompression followed by posterior occipito-cervical stabilization[4,5]. Cervical traction was not used in this patient pre-operatively and anterior approach was avoided as she had a tracheostomy in situ.

Cervical spine involvement in rheumatoid arthritis should be diagnosed and treated as early as possible to minimize preventable morbidity. However, diagnosis at an advanced stage should not preclude consideration of surgical treatment, as surgical intervention has shown to improve function and preserve life even in severe grades of myelopathy[3].

References

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