



Case Report

Odontoid fracture complicating ankylosing spondylitis

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Patients with ankylosing spondylitis are prone to fractures. We describe a 32-year-old male patient with an odontoid fracture and anterior dislocation of C1 vertebra relative to C2 complicating ankylosing spondylitis. The importance and difficulties of the rehabilitation program are stressed. The role of magnetic resonance imaging and three-dimensional computerized tomography in diagnosis is emphasized.

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Introduction

The cervical spine is frequently affected in patients with ankylosing spondylitis (AS) and is susceptible to fractures after relatively minor trauma. Fractures in these patients tend to involve the lower cervical vertebra.¹ Injuries of the axis are thought to comprise up to 17% of cervical spine injuries.² There are only a few cases cited in the literature of fracture-dislocation involving the odontoid process in AS.^{3–9} We report a case of odontoid fracture and anterior dislocation of C1 vertebra relative to the C2 complicating AS. The role of magnetic resonance imaging (MRI) and three-dimensional computerized tomography (CT) in diagnosis is emphasized. The importance and difficulties of the rehabilitation program in this course are stressed.

Case report

A 32 year-old male farmer attended the emergency center with severe neck pain, numbness and weakness in the extremities after a fall at home. He suffered two falls occurring 3 months apart, and the second one caused him to land face up on the floor. He had a history of inflammatory neck and low back pain for 5 years and clinically diagnosed ankylosing spondylitis. There was no history of psoriasis or inflammatory bowel disease.

Physical examination revealed a fixed cervical spine with a little anterior flexion; the thoracic and lumbar areas of the spine were rigid. Both hips had a restricted range of motion with 5° on right and 15° on left internal rotation. He had a marked neurologic

deterioration with a central cord pattern myelopathy. There was a C5 motor level affecting the upper extremities more densely than the lower extremities and a sensory level at C3–4 with sacral sparing. All deep tendon reflexes were brisk and plantar responses were bilaterally extensor. He had bilateral ankle clonus. Radiographs showed a type II odontoid fracture, with marked anterior dislocation of C1 relative to the C2 vertebra and extensive ankylosis of the cervical spine (Figure 1). CT scan and spiral CT images demonstrated anterior migration of atlas (Figure 2A,B). Sagittal MRI of the same patient revealed an odontoid fracture and anterior migration of atlas with respect to the axis, together with spinal cord compression (Figure 3). Films of the pelvis and thoracolumbar spine showed fusion of the sacroiliac joints and the classic bamboo appearance of the spine associated with AS.

Dexamethasone treatment was applied and the patient had a posterior transarticular screw fixation and wiring. After the operation motor power recovered nearly 20% with persisted hyperreflexia, clonus and bilateral extensor plantar responses. Sensation remained unchanged. A Philadelphia collar was used for 12 weeks. At the fourth month of injury and after 2 months of the rehabilitation program he was discharged home. At the sixth month of injury, the patient was tetraparetic, able to drive a wheelchair with a hand control unit, and dependent in activities of daily living.

Discussion

The ankylosed spine is more prone to fractures than the normal spine.¹⁰ Predisposing factors that put the

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Figure 1 Lateral radiograph demonstrates a subtle fracture of dens and anterior sliding of C1 vertebra with respect to C2. Extensive ankylosis of the cervical vertebra is also seen

ankylosed spine at risk include osteoporosis, lack of spinal mobility, and vulnerability to falls due to progressively unstable kyphotic postures.^{4,5} The recognition of fractures in patients with AS is often difficult due to osteoporosis and fusion with lack of obvious displacement.⁶ As in our case it is difficult to evaluate the odontoid process in plain films because of severe osteoporosis and periarticular ligament calcifications. Computed tomography has been shown to be an excellent modality for evaluating fractures of the cervical spine. In AS, with inadequate plain films, it may be particularly helpful. However the problems, due to the difficulty in positioning the patient especially with fracture-dislocation of the cervical spine, were overcome by three-dimensional CT.¹¹ Despite this, MRI is the best diagnostic technique to demonstrate cervical fracture in patients with ankylosing spondylitis. Magnetic resonance imaging has the potential to show intramedullary edema, cord compression, and intraspinal hemorrhage.¹²

During rehabilitation of the patient, he had no respiratory or urinary problems. Though he had reduced chest expansion due to AS, his diaphragmatic respiration, was adequate. The postural drainage of lung secretions has a vital importance

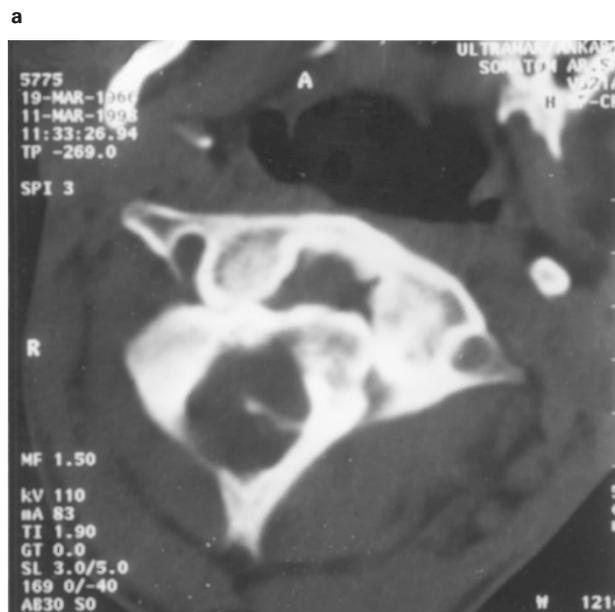


Figure 2 (A) Axial computed tomogram of the upper cervical spine demonstrates anterior sliding of atlas with a little rotation, and the dens unsatisfactorily visualized. (B) Lateral view of three-dimensional CT shows anterior sliding of atlas

in such cases. The spinal rigidity, makes it difficult for the patient to sit and balance during movement. Patients with AS are at high potential risk of disability, resulting from the disease itself. Life long exercises have a vital importance in these patients since immobilization causes a rapid progression of the disease and also osteoporosis. Because of this, it is extremely important to mobilize such patients immediately, and begin assistive range of motion and respiratory exercises more rapidly and carefully than the other tetraparetic patients.

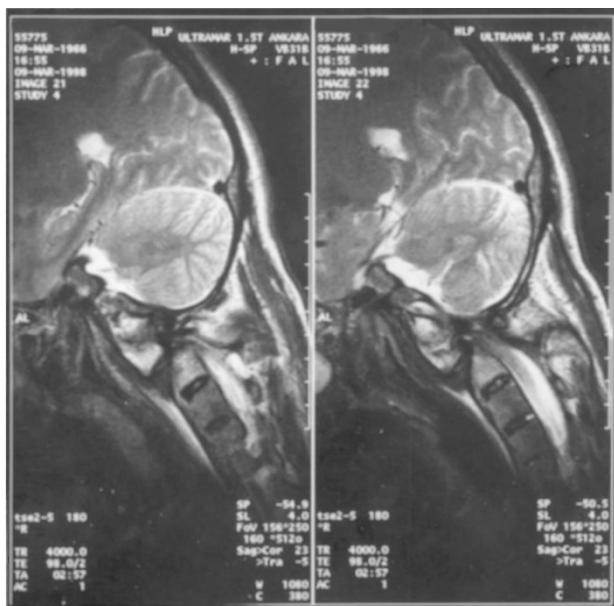


Figure 3 T2-weighted sagittal MRI of the cervical spine shows odontoid fracture, anterior sliding of atlas, and cord compression

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