Abstract  We report on a 38-year-old man with post-traumatic posterior displacement of the atlas with respect to the axis without any associated fracture or neurological deficit caused by the displacement. Radiographs, computed tomography (CT) and magnetic resonance imaging (MRI) revealed posterior displacement of the atlas with the odontoid peg lying anterior and to the right of the anterior arch of the atlas.

Keywords  · Atlas · Dislocation · Posterior · CT · MRI

Introduction

Posterior atlantoaxial dislocation without any associated fractures is exceedingly rare [1]. Magnetic resonance imaging (MRI), computed tomography (CT) with multiplanar reconstruction (MPR) and three-dimensional reconstruction provide excellent visualisation of the rare dislocation discussed in this report.

Case report

A 38-year-old man was admitted to our hospital after a road accident, following which he was unable to move his right upper limb or turn his neck to the right side. On examination, the patient was well oriented in time and space and his higher motor functions were normal. Movements of his right shoulder were absent in all directions. Flexors and extensors of the right elbow had grade 0 force. The right wrist extensors and flexors had grade IV–V force. Hand movements were normal. All other limbs had grade V force. Right biceps jerk was absent. All biochemical investigations were within normal limits.

Fig. 1  Lateral scanogram of the neck revealing posterior displacement of the atlas. Note the disruption of the spinolaminar line (closed arrowhead)
Radiographs of the neck revealed posterior displacement of the atlas with respect to the axis, resulting in disruption of the spinolaminar line (Fig. 1).

CT scan of the cervical spine with MPR in the coronal and sagittal planes along with three-dimensional reconstruction revealed posterior atlantoaxial dislocation with atlantoaxial rotation. The odontoid peg was seen anterior and to the right of the anterior arch of the atlas. No fracture was visualised (Figs. 2, 3).

MRI of the cervical spine confirmed the CT findings. A haematoma was present within the spinal canal, leading to kinking of the cervico-medullary junction; however, no evidence of any cord oedema was visualised (Fig. 4).

MRI of the brachial plexus revealed contusion injury to the right-sided peripheral nerves, trunks and divisions.

The patient was put on halo traction with an 8-kg weight, but started developing quadriplegia and was therefore given surgical treatment. Partial odontoidectomy with posterior fixation was performed (Figs. 5, 6). The patient did well post-operatively and showed good neurological recovery over a period of 3 months during which he was seen at follow-up in the outpatient department.

Discussion
Isolated post-traumatic atlantoaxial subluxation is a rare injury [2]. Non-traumatic atlantoaxial subluxation is far