

Cervical spine fracture in Ankylosing Spondylitis (AS)

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A 42 year old man while riding a snowmobile at a high speed crashed against a rock. He sustained injury to his head and had a brief period of loss of consciousness but was eventually able to get up and ride back home. Over the period of next two days his neck pain intensified and he developed shooting pain in the left arm along with some weakness in both upper extremities more so in the left arm and hand. He also had numbness and tingling in the radial aspect of forearm and in second and third digit of left arm. He did not report any symptoms pertaining to lower limbs or bladder and bowel. Examination in the emergency room showed mild weakness in left and right biceps, triceps, wrist extensors and finger flexors. Examination of the sensory system revealed decreased sensations in C6, C7 and C8 dermatomes on both sides. Examination of lower extremities was unremarkable. Per rectal exam also showed a normal sphincter tone. Plain X-rays showed ankylosing spondylitis (AS) like features with both sacroiliac joints completely fused. His cervical spine X-rays showed some anterolisthesis of C6 over 7 and signs of extensive fusion of the bony

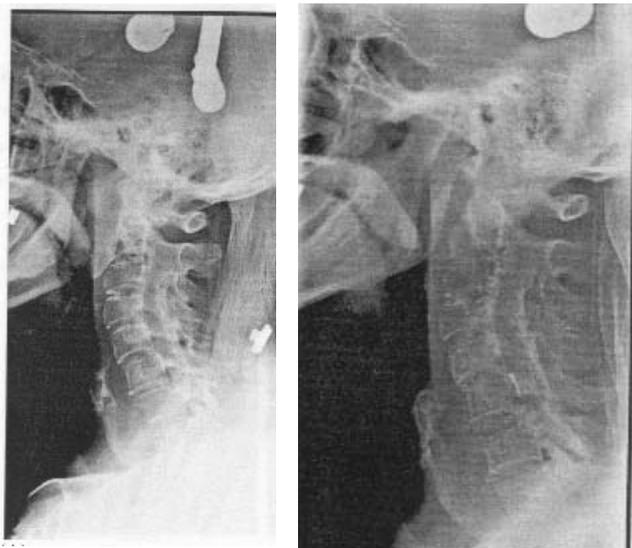


Figure 1. (A) anterolisthesis of C6 over C7, extensive fusion of the posterior elements can be seen as well. (B) Post traction images show reduction of the slip, mild disc over-distraction can also be noted.

elements anteriorly and posteriorly. An MRI was done which showed cord impingement at the level of C6-7 disc but no posterior disc extrusion. Another interesting feature was the presence of a large posterior non-compressing epidural haematoma, which extended from the C7 vertebra

to the upper thoracic levels. There were though no symptoms or signs attributable to this epidural haematoma. This patient was placed in a halo and in 20 lbs of traction. This led to reduction of the anterolisthesis. He later underwent anterior instrumentation and stabilization from C5 to T1 followed by a subsequent posterior procedure which involved

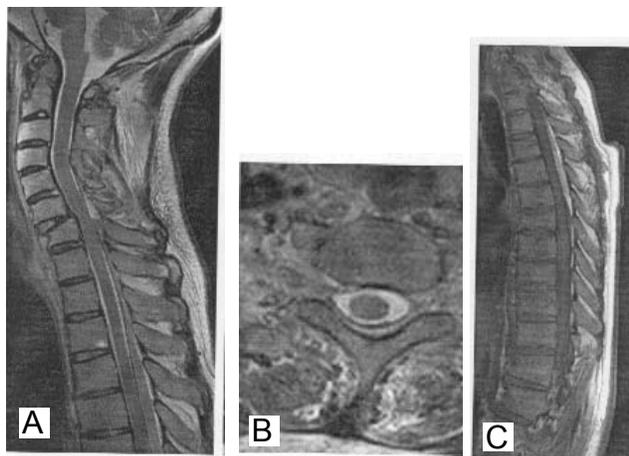


Figure 2. (A) Anterolisthesis of C6 over C7 and cord impingement can be seen along with the non compressing posterior spinal epidural hematoma. (B) Axial image through the thoracic spine shows the posterior non compressing epidural hematoma (C) Epidural hematoma as seen in the thoracic spine.

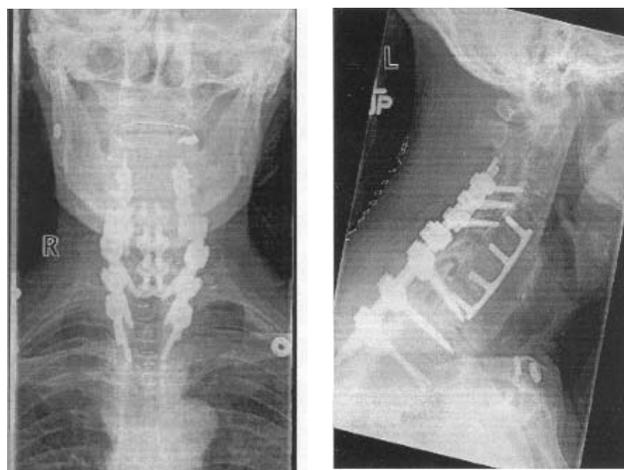


Figure 3. Postoperative AP and Lateral views show the instrumentation in the reduced position.

posterior instrumentation and fusion from C5 to T3. Asymptomatic spinal epidural haematoma was not decompressed. The patient remained well postoperatively and over the period of next few months demonstrated a normal neurology on examination.

Commentary

Ankylosing Spondylitis (AS) is a sero-negative inflammatory disorder affecting the axial skeleton though peripheral sites in the body including hip, knee and shoulder may also be affected. AS usually affects males (4:1 ratio) in the second to fourth decade of life. AS has been found to be genetically linked. About 80 to 95% of patients with AS are HLA-B27 positive. Carriers of HLA-B27 have a higher risk (16-50%) of developing the manifestations of AS compared to controls. In AS the inflammation starts at the insertion of the tendons and eventually leading to ossification, resulting in a "Bamboo Spine". Usually patients would present with non-mechanical back pain and stiffness particularly in the morning. Complaints of chest wall pain are also not uncommon on deep inhalation. Chest expansion in patients with AS is typically <2.5 cms when measured at the 4th intercostals space. Late in the disease, increased kyphosis may develop leading to loss of the normal cervical or lumbar lordosis. The stiffness of the spine in flexion and extension is also one of the common manifestations in the advanced stage. Involvement of Sacroiliac joints and hip may lead to tenderness or formation of flexion contracture at the hip joint. In patients with AS the risk of sustaining a vertebral fracture are quite high. The reasons being twofold i.e an osteoporotic and rigid spine. The long lever arms of the fused cervical spine act with the weight of the head and can lead to fracture at the cervicothoracic junction or an adjacent level. The chances of such an injury getting missed is quite high due to the highly distorted anatomy visible on x-rays in AS due to the ossification, vertebral wedging, syndesmophytes and patient positioning. It has to be very clearly understood that many of these advanced AS patients have their spines fused in the position of flexion so during application of collar or any other positioning of the cervical spine in the field or in ER should be done with great caution. In case any information is available in this regard, it should be utilized completely. In order that these tricky injuries do not

get missed, aggressive and thorough radiological evaluations should be performed and this may include plain X-rays, thin section CT scan and or MRI. Secondly the index of suspicion for a fracture, in any patients with AS complaining of neck or back pain, should be very high. The lumbar and thoracic spines are less likely to fracture as compared with cervical spine because of the support provided by the ossified anterior and posterior longitudinal ligaments. The chances of neural injury in AS patients with spinal fracture are quite high because of the long lever arms, occurrence of epidural hematoma and that the injury usually is a three column injury leading to more instability. Great care should be taken to align these fractures during reduction, traction and surgery as the chances of reversing the deformity and over distraction exists. These patients with cervical fractures in AS should be fixed over an adequate length of the spine considering the long lever arms that would act on this newly mobile segment. Circumferential instrumentation and fusion increases the rigidity of the construct in such unstable settings.

References

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