

Closed reduction of a C6/7 fracture subluxation in Ankylosing Spondylitis– A lifesaving procedure (A case Report)

Introduction:

Spinal fractures are up to four times more common in patients with AS than the general population. Fractures in this population have a high incidence of neurologic complications, with spinal cord injury at initial presentation. The vast majority of these injuries are 3-column injuries resulting in an unstable spine. The diagnosis unfortunately, can frequently be missed or delayed. The mortality rate ranges from 18 to 32% in various series¹⁻⁴

Keywords: Ankylosing Spondylitis, Spinal Fractures, Cervical Spine, Closed Fracture Reduction, Spinal Cord Injuries

Received: 6 months before printing; Accepted: 2 Months before printing

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Introduction

Case History

A 78-year-old gentleman with Ankylosing Spondylitis was admitted to our emergency department following a fall after consumption of a moderate degree of alcohol. He complained of significant neck pain and increased cervical kyphotic deformity. On physical examination, he had some tenderness on lower cervical spine on palpation, with no neurologic deficit on careful examination. X-rays and CT scan of the cervical spine were performed immediately after his arrival. Plain X-rays were inconclusive but CT demonstrated a fracture through areas of bony ankylosis with subluxation at C6–C7 (Fig 1a, b & c).

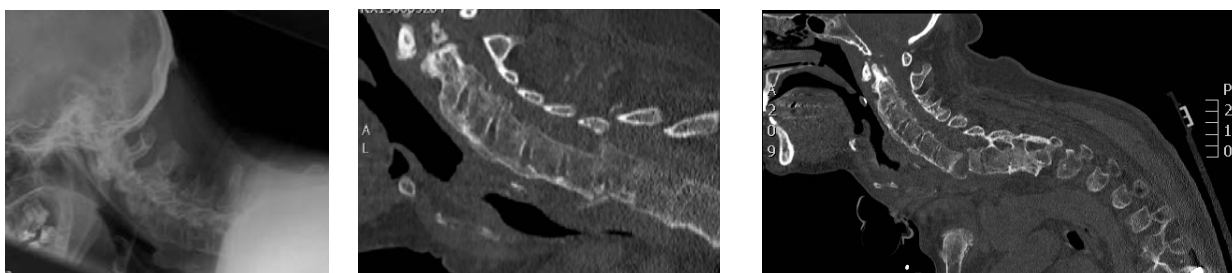


Fig 1(a): Lateral X-ray of the cervical spine missing C6/C7 level. Fig 1 (b)&(C): CT scan of the cervical spine showed fracture subluxation corresponding with patient's pain and increased cervical kyphotic deformity. .

The patient was fitted with a rigid collar in emergency department and admitted to the ward for further investigations and treatment. Unfortunately, a few hours later, the patient's breathing deteriorated and he was transferred to the intensive care unit where an emergency intubation was attempted but failed due to significant cervical kyphotic deformity. An attempt on tracheostomy was also unsuccessful.

The spinal team was contacted, and a thorough assessment of the patient's condition was made. He was found to have normal neurology both in the upper and lower limbs but complaining of severe pain and difficulty in breathing. A halo was immediately applied to the skull and controlled reduction of the fracture/subluxation was attempted by a combined gentle longitudinal traction and hyperextension manoeuvre. During this manoeuvre the patient remained fully alert and co-operative (Fig 2).



Fig 2: Full reduction of the fracture and correction of the cervical kyphotic

deformity following traction.

With careful manipulation of the cervical spine by traction and hyperextension his head was brought from a flexed position to neutral position and full correction of cervical kyphotic deformity was achieved. The halo vest was then applied and the head secured in desired neutral position. This allowed the anaesthetic and ENT teams to attempt an awake intubation. Unfortunately, it was noted that the patient's epiglottis was significantly swollen due to previous attempts and therefore a tracheostomy was performed. The patient's general condition significantly improved and was ready for spinal stabilisation 2 weeks later. He underwent a posterior cervical fusion with segmental screw fixation from C3 to T5, Fig 3(A). During surgery cord monitoring was used (SSEP & MEP), neurological status throughout the surgery remained unchanged. After surgery he was put in hard collar for 4 weeks followed with two weeks soft collar. The patient was seen in our outpatient clinic on regular basis 3, 6, 12 and 24 months after surgery, neurological examination was normal and he could walk with a normal gait.. X-rays taken at his last appointment showed satisfactory position of instrumentation and solid fusion. The patient was very happy with the correction of his cervical kyphotic deformity Fig 3 (B & C)



Fig 3 (A): Intra-operative photograph, showing the extend of instrumentation from C3 to T5.

Fig 3 (B & C) post -op X-rays showing satisfactory position of instrumentation.

Discussion & Conclusion

This is the first report of successful closed reduction of a cervico-thoracic kyphotic deformity in a patient with Ankylosing Spondylitis who sustained a C6/7 fracture subluxation.

Patients with AS are susceptible to spinal fracture and cord injury from minor trauma^{4,5}. Initial immobilization is mandatory to prevent iatrogenic neurological injury. A multidisciplinary team approach (MDT) to assess the patient's pulmonary function is the best practice approach.

The most frequent cause of death both in the acute phase and at later follow up is respiratory complications such as pneumonia^{4,6,7}.

In this patient, the chin on chest deformity was successfully reduced at the fracture site by a combination of gentle traction and hyperextension. This manoeuvre not only corrected the deformity but also allowed the supporting teams to provide essential life support with intubation and subsequently a tracheostomy. We recommend performing this procedure in the awake patient in the operating room with the presence of anaesthetic and ENT support team. The procedure should be performed in a controlled environment and under the direction of an experienced spinal surgeon. Any significant displacement or malalignment of the cervical fracture warrants gentle lowering of traction -weight used for realignment. We recommend 5lbs weight initially to be used for the skull traction and one pound to be added every day until full correction of the deformity has been achieved. Regular neurological examination should be performed every 2 hours and X-ray control every day. The force vector should be directed towards existing deformity

and gradually brought to extension with one-pound weight every day.

Significant traction can lead these fractures to be easily over-distracted. Extreme caution must be exercised with regard to patient's positioning and transfers. A multidisciplinary team approach with a thorough preoperative plan is essential for good outcome. The anesthetic team should be aware of the cervical kyphotic deformity since attempts to hyperextend the neck will either be restricted or will cause extension through the fracture resulting in neurologic embarrassment. We believe, that closed reduction of cervical fracture is a safe method of treatment for the patients with un-displaced or minimally displaced fractures of the cervical spine.

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