

## Research Article

# Rationale of fracture management in ankylosed vertebra- a review of different techniques

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### Vertebral Fracture In Ankylosing Spondylitis

In as, the risk of vertebral fracture is increased. Diagnosis of vertebral fracture is not easy, although their clinical consequences in aggravating spine deformities (hyperkyphosis) and complications are increasingly recognized (Geusens et al.2007). In a study in France VF in AS was found as high as 17% (1). Fractures are common in AS spine following minor low- energy trauma because of alteration in the bone composition and biomechanical properties.

The classification of the supportive ligaments and soft tissues make these fractures unstable and susceptible to displacement and neurological deficit. (2,3). Complication rates are high with 51% in AS patients with overall mortality rate within 3 months period is 17.7% in AS patients. 8-13 of patients have multilevel fractures. Incidence of spinal cord injury is 11 times higher than the general population (4), The average age of fracture is 63.4 yrs(5). The treatment is challenging because of kyphosis, osteoporosis, associated with restrictive lung disease, and medical comorbidities.

### Management Of Vertebral Fractures In Ankylosin Spondylitis Patients

The management would be divided into medical and surgical managements. Initially protected transfers are essential to prevent secondary neurological insult. Due to increasing age at presentation and associated medical diseases, the incidence of mortality and morbidity is higher. Conservative methods, including immobilization by a Halo vest and prolonged bed rest in traction or a collar, have been associated with a high rate of complications. With advances in care and surgical technique, there is a rising trend to surgery.

### Conservative Treatment

Non-surgical management is usually not recommended in patients with fractures in AS. The fractures in AS are usually unstable, more likely to get displaced and cause delayed neurological deficit. 46% of the patients were treated by conservative methods.[5] Conservative approach was chosen either because of high anesthetic risks or following patient's refusal to undergo surgery. Nonoperative treatment had higher rates of fracture displacement, worsening neurology, and nonunion compared to surgical treatment.

[5] Conservative care includes halo vest or cervical collar for cervical fractures.[6] The kyphotic deformity and the abnormal body morphology necessitates the use of customized braces to maintain the natural preinjury contour. Patients should be regularly followed up and observed for any displacement of the fracture. Surgical principle Fractures in ankylosed spine are analogous to that of long bone diaphyseal fractures, the principles of which mandate multilevel fixation. Although most of the patients can be operated electively, patients with incomplete neurological deficit and secondary neurological insult should be operated on emergently.

### Role of preoperative traction

Significant fracture malalignment requires a low weight skull traction not exceeding 5–10 lb. The traction direction is chosen to take the preinjury cervicothoracic alignment into consideration as hyperextension should be avoided to prevent neurological deterioration.

### Positioning

Due to the highly unstable nature of these injuries, patients are at risk for neurological worsening when being intubated. The risks associated with positioning can be minimized by awake fiberoptic intubation and electrodiagnostic monitoring, rigid fixation of the skull with Mayfield clamps or a comparable device. Anterior versus posterior versus circumferential stabilization Anterior access is less traumatic (hence more suitable for patients with poor constitutions), minimizes the risks of displacement during positioning, provide immediate stability and a greater surface area for bony fusion and has less incidence of postoperative infections. However, the biomechanical stability of anterior approach is questionable as osteoporosis frequently seen in these patients preferentially affects the anterior column. Failure rates of initial anterior fixation as high as 50% have been reported. The posterior alone approach can restore the alignment of the spine, stabilize the injured segments, and allow broad decompression of neurological elements. Multisegmental posterior fixation with autologous cancellous bone graft offers a biomechanical advantage

over anterior fixation and has resulted in decreased morbidity compared with combined anterior-posterifixation.

However, the extensive dissection of muscles required, increased risk of wound infection, and inability to access anterior spinal cord compression are its disadvantages. It is unsuitable for cases with anterior fracture gaps. In addition, a fusion of the posterior elements may make localization of the anatomic landmarks difficult which can lead to pedicle fracture, neurodeficit, and vertebral artery injury. The anteroposterior or the circumferential approach is the current treatment of choice in cases with marked three column instability.[7] It is used in approximately 25% of patients with AS and cervical spine fractures. The primary indication of adding an anterior approach to posterior surgery is the presence of a persistent deformity, gap or displacement that is compromising the spinal cord following posterior instrumented reduction. The high morbidity associated with the procedure in the form of long surgical duration, blood loss, and great trauma. I recommend a combined approach for unstable fractures (translation, distraction, or angulation) and fractures with anterior gap. Irrespective of the approach used it is important to augment screw purchase by increasing number of fixation points, using larger diameter screws, trying for bicortical purchase, and convergent screws. Authors have used variable approaches, with their associated complications. Complication Compared to the healthy general population, the morbidity of spine fracture in AS is 3.5 times higher.[8] The most frequent cause of death both in the acute phase and at later follow up is respiratory complication such as pneumonia. Associated visceral injuries and rare intrathoracic complications including tracheal rupture and aortic laceration or dissection in thoracolumbar injuries have been cited in the literature. Loss of reduction, nonunion and neurological deterioration have

been reported after nonoperative treatment, which often leads to secondary surgery.[9] With regard to the surgical treatment, wound infections up to 16%, pulmonary complications up to 63%, and mechanical complications up to 23% are described.[9] Therefore, an appropriate standardized workup before decision making.

### Conclusion

Fractures are a serious complication of AS and patients are more prone to develop neurological deficits. Most often, the underlying mechanism of injury is a small magnitude force. Nonsurgical treatment has largely been replaced by surgical treatment in view of the significant risk for secondary loss of reduction and neurological aggravation along with pulmonary and decubitus complications. can be anterior, posterior (most commonly performed), or combined depending upon the location and pattern of injury. However, surgical management does not change the inherent complication rates and mortality risks which are largely dependent on the initial injury severity and comorbid conditions.

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