

# Abstract #1392.doc

## **A radiographic evaluation of facet sagittal angle in cervical spinal cord injury without major fracture or dislocation**

### **Introduction**

Most patients with traumatic cervical spinal cord injury (CSCI) without major fracture or dislocation are elderly and present with spinal hyperextension predominantly at the C3-4 level. However, few reports have described the biomechanical etiology of traumatic CSCI without major fracture or dislocation

The aim of the current study is to evaluate the relationship between the facet sagittal angle and incidence of traumatic CSCI without major fracture or dislocation.

### **Materials and Methods**

A total of 113 patients (average age, 62 years) with traumatic CSCI without major fracture or dislocation were included in this study. Three subjects had an injury at the C2-3 segment, 61 at the C3-4, 32 at the C4-5, 13 at the C5-6, and 4 at the C6-7. Eighty four healthy volunteers (average age, 51 years) without neurologic deficits or cervical cord pathology on MRI were defined as control subjects.

We used a plain radiograph to measure the facet sagittal angle at 5 intervertebral disc levels in all the CSCI patients and controls. We defined the facet sagittal angle as angle between the inferior margin of the superior cervical spinal body and inferior articular process of superior vertebra.

### **Results**

The incidence of traumatic CSCI without major fracture or dislocation at the C2-3, C3-4, C4-5, C5-6, and C6-7 segments was 2.7, 54, 28.3, 11.5 and 3.5%, respectively. For all segments, except C2-3 and C6-7, C3-4 of the facet sagittal angle was significantly smaller than C4-5 and C5-6.

### **Discussion**

We believe that morphological differences among the segments may contribute to the mechanism of traumatic CSCI. According to our results, the facet sagittal angle at the C3-4 segment was significantly smaller than that at the C4-5 and C5-6 segments. In this study, we hypothesized that traumatic CSCI without major fracture or dislocation was associated with facet joint morphology.

### **Conclusion**

The cervical spinal cord at the C3-4 segment might receive the highest load during acute hyperextension of the cervical spine because of the facet joint morphology. This facet sagittal angle at the C3-4 segment may play an important role in the etiology of traumatic CSCI at the C3-4 segment.