Anterior longitudinal ligament

The anterior longitudinal ligament is a ligament that runs down the anterior surface of the spine. It traverses all of the vertebral bodies and intervertebral discs.

The ligament is thick and slightly more narrow over the vertebral bodies and thinner but slightly wider over the intervertebral discs which is much less pronounced than that seen in the posterior longitudinal ligament.

The ligament actually has three layers: superficial, intermediate and deep.

The superficial layer traverses 3 – 4 vertebrae, the intermediate layer covers 2 – 3 and the deep layer is only between individual vertebrae.

From a retrospective study of 412 thoracolumbar region injuries, Denis introduces the concept of middle column or middle osteoligamentous complex between the traditionally recognized posterior ligamentous complex and the anterior longitudinal ligament. This middle column is formed by the posterior wall of the vertebral body, the posterior longitudinal ligament and posterior annulus fibrosus.

The third column appears crucial, as the mode of its failure correlates both with the type of spinal fracture and with its neurological injury. Spinal injuries were subdivided into minor and major. Minor injuries are represented by fractures of transverse processes, facets, pars interarticularis, and spinous process. Major spinal injuries are classified into four different categories: compression fractures, burst fractures, seat-belt-type injuries, and fracture dislocations. These four well-recognized injuries have been studied carefully in clinical terms as well as on roentgenograms and computerized axial tomograms. They were then subdivided into subtypes demonstrating the very wide spectrums of these four entities. The correlation between the three-column system, the classification, the stability, and the therapeutic indications are presented 1).

1) Denis F. The three column spine and its significance in the classification of acute thoracolumbar spinal