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Pain and Discomfort Felt in Middle and Upper Back Areas

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Abstract

Between the vertebrae of each spinal segment are two facet joints. The facet joints are located on the back of the spinal column. There are two facet joints between each pair of vertebrae, one on each side of the spine.

Keywords: Alignment; Spinal; Ligament; Tomography; Myelography; Vertebral body; Therapeutics

Introduction

A facet joint is made of small, bony knobs that line up along the back of the spine. Where these knobs meet, they form a joint that connects the two vertebrae. The alignment of the facet joints of the thoracic spine allows freedom of movement as you twist back and forth or lean side to side. The surfaces of the facet joints are covered by articular cartilage. Articular cartilage is a slick, rubbery material that covers the ends of most joints. It allows the ends of bones to move against each other smoothly, without friction. On the left and right side of each vertebra is a small tunnel called a neural foramen [1]. The two nerves that leave the spine at each vertebra go through the foramina, one on the left and one on the right. The intervertebral disc sits directly in front of the opening. A bulged or herniated disc can narrow the opening and put pressure on the nerve. A facet joint sits in back of the foramen. Bone spurs that form on the facet joint can project into the tunnel, narrowing the hole and pinching the nerve. The hollow tube formed by the bony rings on the back of the spinal column surrounds the spinal cord. The spinal cord is like a long wire made up of millions of nerve fibres. Just as the skull protects the brain, the bones of the spinal column protect the spinal cord. The spinal cord travels down from the brain through the spinal column. In the thoracic spine, the spinal canal is narrower than in the than in the rest of the spine, giving very little extra space for the spinal cord as it passes through the thoracic spine. Between the vertebrae, two large nerves branch off the spinal cord, one on the left and one on the right. The nerves pass through the neural foramina of each vertebra [2]. These spinal nerves group together to form the main nerves that go to the organs and limbs.

Discussion

The nerves of the thoracic spine mainly control the muscles and organs of the chest and abdomen. Connective tissues are networks of fibre that hold the cells of the body together. Ligaments are strong connective tissues that attach bones to other bones. Several long ligaments connect on the front and back sections of the vertebrae. The anterior longitudinal ligament runs lengthwise down the front of the vertebral bodies. Two other ligaments run full length within the spinal canal. The posterior longitudinal ligament ligament attaches on the back of the attaches on the back of the vertebral bodies. The ligamentum flavum is a long elastic band that connects to the front surface of the lamina bones. Thick ligaments also connect the ribs to the transverse processes of the thoracic spine [3]. A special type of structure in the spine called an intervertebral disc is also made of connective tissue. The fibres of the disc are formed by special cells, called collagen cells. The fibres may be lined up like strands of nylon rope or crisscrossed like a net. An intervertebral disc is made of two parts. The Centre, called the nucleus, is spongy. It provides most of the shock absorption in the spine. The nucleus is held in place by the annulus, a series of strong ligament rings surrounding it. Discs in the thoracic spine are much thinner than in the cervical and lumbar spine. As a result, there is generally less movement between the vertebrae of the thoracic spine. The muscles of the thoracic spine are arranged in layers. Those closest to the skin's surface run from the back of the vertebrae to the shoulder blades [4]. Others wrap around the rib cage and connect to the shoulders. Strap shaped muscles called erector spinal make up the middle layer of muscles. These muscles run up and down over the lower ribs and thorax, and cross to the low, and cross to the low back. The deepest layer of muscles attaches along the back of the spine bones, connecting the vertebrae. Muscles also connect from one rib to the next. A good way to understand the anatomy of the thoracic spine is by looking at a spinal segment. Each spinal segment includes two vertebrae separated by an intervertebral disc, the nerves that leave the spinal column at each vertebra, and the small facet joints that link each level of the spinal column [5]. Many important parts make up the anatomy of the thoracic spine. Understanding the regions and structures of the thoracic spine can help you become more involved in your health care and better able to care for your back problem [5]. A bony knob projects out at the point where the two lamina bones join together at the back of the spine. You can feel these projections, called spine processes, as you rub your fingers up and down the middle of your back. Bony knobs also point out from the side of the bony ring, one on the left and one on the right. These projections are called transverse processes. A bony ring attaches to the back of each vertebral body. This protective ring of bone surrounds the spinal cord, forming the spinal canal. Two pedicle bones connect directly to the back of the vertebral body. Two lamina bones join the pedicles to complete the ring. The lamina bones form the outer rim of the bony ring. When the vertebrae are stacked on top of each other, the bony rings form a hollow tube that surrounds the spinal cord and nerves. Myelography in three patients demonstrated an intramedullary process presumed to be hematomyelia. Two were associated with a block of the spinal canal. At our institution myelograms are thought to be of limited value in the evaluation of spinal injury. The principal

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indications are a spinal cord injury in the absence of radiographic abnormalities and patterns might provide insight into the mechanism of injury , furnish a useful clinical shorthand to designate such injuries, and might prove to have either therapeutic or prognostic implications. There was a wedged compression fracture of the inferior vertebra with a small triangular fragment displaced anteriorly and the facet joints between the involved vertebrae were disrupted [6]. The disruption of the facet joints consisted most commonly of a horizontal fracture through the base of the superior facet of the vertebra below or a fracture through the lamina of the vertebra above the level of the dislocation. Subluxation of the facet joints and locking or perching of the facets were less common. Locking of facets is a displacement of the inferior facet of the vertebra above anterior to the superior facet of the vertebra below the level B of dislocation. Perching of facets is an upward and anterior displacement of the inferior facet of the vertebra above such that it comes to rest on top of the superior facet of the vertebra below the dislocation. In four other patients, compression fractures of the superior end plate of one or more contiguous vertebral bodies below the wedged vertebrae at the level of the dislocation were present in addition to those fractures described in the basic pattern [7]. In this pattern there may also be additional fractures of the posterior elements below the dislocation. In seven patients, the deformities were well visualized on tomography and were clearly different in character from those described above. In three, no fracture was identified. Two of these had a minimal dislocation. In one, the superior vertebra was dislocated anteriorly and in the other, posteriorly [8]. In the third, there was neither dislocation nor fracture. In two other patients, there was posterior dislocation of the vertebral column above a grossly comminute vertebral body, and in two others, lateral dislocation in association with gross comminute of a vertebral body. In each of these there were a variety of fractures of the posterior elements. The injury could not be classified in the remaining six patients, primarily because only plain films had been obtained [9]. Tomography had not been performed and the morphology of the lesion was not thought to be sufficiently defined to allow classification. The mechanism of injury is complex, combining several movements either simultaneously or in sequence. It is likely that these lesions represent the end result of simultaneous or sequential flexion, axial compression, rotation, and forward shearing forces. In any event, the resultant deformity is grossly unstable because of the complete transection of bone and intervening ligaments at the level of the fracture dislocation. Flexion accounts for the disruption of the facet joints with resultant subluxation, locking, or perching of the facets. Axial compression accounts for the compression fractures of the vertebral bodies. Forward shear creates the fractures of the superior facets. The three basic patterns of injury we describe provide a classification of mid and upper thoracic spine injuries not previously depicted. At present, no definite therapeutic or prognostic differences among the three patterns are apparent [10].

Conclusion

However, characterization of the posterior elements in particular is important, since locking of facets requires that the spine be distracted at the time a stabilization procedure is performed. Recognition of non-contiguous fractures also has important therapeutic implications.

Acknowledgement

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Conflict of Interest

None

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