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Anatomy and biomechanics of the vertebral aponeurosis part of the posterior layer of the thoracolumbar fascia.

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Abstract

There is significant paucity in the literature regarding vertebral aponeurosis. We were able to find only a few descriptions of this specific fascia in the extant medical literature. To elucidate further the anatomy of this structure, forty adult human cadavers were dissected. Both quantitation and anatomical observations were made of the vertebral aponeurosis. The vertebral aponeurosis was identified in 100% of specimens. This fascia was identified as a thin fibrous layer consisting of longitudinal and transverse connective tissue fibers blended together deep to the latissimus dorsi muscle. It attached medially to the spinous processes of the of the thoracic vertebrae; laterally to the angles of ribs; inferiorly to the fascia covering the serratus posterior inferior muscle (superficial lamina of the posterior layer of thoracolumbar fascia); superiorly it ran deep to the serratus posterior superior and splenius capitis muscles to blend with the deep fascia of the neck. At the level of the serratus posterior inferior muscle, the vertebral aponeurosis fused to form a continuous layer descending toward the sacrotuberous ligament covering the erector spinae muscle. Morphometrically, the mean length of the vertebral aponeurosis was 38 cm and the mean width was 24 cm. The mean thickness was three mm. There was no significant difference between left and right sides, gender or age with regard to vertebral aponeurosis length, width, or thickness ($P > 0.05$). During manual tension of the vertebral aponeurosis, the tensile force necessary for failure had a mean of 38.7 N. In all specimens, the vertebral aponeurosis was capable of holding sutures placed through its substance. We hope that these data will be of use for descriptive purposes and may potentially add to our understanding of the biomechanics involved in movements of the back. As back pain is perhaps the most common reason patients visit their physicians, additional knowledge of this anatomical region is important.

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