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## Evolution of the ischial spine and of the pelvic floor in the Hominoidea.

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### Author information

### Abstract

Study of the pelvis in 143 different mammals reveals that in quadrupeds the ischial spines are barely noticeable and are located posteriorly near the sacrum. In humans, the ischial spines are prominent and more anteriorly located. As a consequence of their position and size, the ischial spines in humans become an obstacle to parturition. Herein a theory is proposed to account for what appears to be an incongruous development and orientation of the ischial spines in humans. The pelvic diaphragm is a vertical pelvic "wall" in tailed mammals and is composed of muscles involved mostly with the motion of the tail. In humans, the muscles of the pelvic diaphragm have a very different anatomical orientation. They form a horizontal pelvic "floor," and their functions are first to support the abdominopelvic organs and resist intra-abdominal pressure that is exerted from above, and second, as levator ani, to control the anal sphincter. In humans the muscles and fascias of the pelvic diaphragm are inserted on the ischial spines either directly or indirectly through the sacrospinous ligament and the tendinous arch of the pelvic fascia. The result is a medial pull on the ischial spines to produce a more rigid and narrower pelvic floor. An inconstant ossification center for the ischial spines make them more prominent. The backward tilt of the sacrum placed the bispinal line in a diameter position. Pongids and even fossil hominids occupy an intermediate position between tailed mammals and Homo sapiens. The present form of the pelvis in Homo sapiens may be determined by a significant genetic component but may also be partly acquired during childhood and adolescence.

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