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CLINICAL TOPIC

Uncinate Processes & Joints of Luschka

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The other day, I was asked what I knew about uncovertebral joints. Unfortunately, my knowledge was vague. I realized that, considering their importance in the cervical spine and the problems associated when they undergo degeneration, a brief review is in order.

Rising superiorward on the posterolateral and lateral margins of the superior aspect of the C3 to T1 vertebral bodies are projected lippings or ridges called unciform or uncinat processes. They form a border between the transverse foramen and nerve root canal and the intervertebral disc. They begin to appear at ages 6 to 9 years and are fully formed in the adult. (1,4,12) Interestingly, uncinat processes are found in creatures with bipedal tendencies such as man, primates, and marsupials but not in pure quadrupeds such as dogs. (3)

The uncovertebral joint of Luschka or neurocentral joint is formed by the medial and slightly cephalic-facing uncinat process and the lateral and inferior-facing concave beveling or semilunar facet that is located on the lateral/posterolateral margin of the inferior aspect of the body of the vertebrabody above. (3,6,11) Sources differ on whether the opposing surfaces are covered with a cartilage extension from the vertebral end plates (6,9) or layers of split anulus fibrosus collagen fibers. (13) The joint space has a capsular ligament on the lateral margin with the medial side is bounded by the anulus fibrosus. (1,3,6) Some have observed that the cleft may continue to enlarge and extend to the nucleus pulposus. (4) In some cases, the

fissure formed may extend across the entire disc. (8,16) There is a debate whether a synovial lining is present. The joint type has not been resolved.

Simplistically, the Luschka joints are thought to limit posterior translation (-Z) and lateral flexion (ØZ) (1,12,13) and guide flexion and extension (ØX). (1,6,12) Lateral flexion is a coupled motion that involves lateral flexion, rotation, and extension, and the uncovertebral joints must move in a complex pattern to accommodate lateral flexion and other motions. If the uncovertebral cleft extends deep into the disc or completely transects it, their contributions to motion would be very complex.

In cervical spine degeneration, loss of disc height approximates the uncinat processes to the superiorly adjacent vertebral body. Uncinat process osteophyte formation with soft tissue protrusions is not uncommon. Because of the proximity of the uncinat processes to the intervertebral foramen, the osteophytes may cause nerve root compression. Some state that nuclear material from fissures combined osteophytes from the uncinat process may form nodules that may compromise adjacent structures. (8) Krämer states that the symptoms may be position dependent. The classic presentation is night pain and paresthesia of "creepy-crawly" feeling and numbness that follows a dermatome. (unlike the non-dermatomal pattern of the T4 syndrome). (7) A more lateral than posterolateral osteophyte projection may cause compression of the adjacent vertebral artery and cause cervicocephalic symptoms that may include headache, dizziness, tinnitus, earaches, visual impairment, balance or gait problems, and/or

difficult swallowing. (7,10) Extensive osteophyte formation may cause both nerve root and vertebral artery compression. (7) (Fig. 1)

On the A-P x-ray, the normal appearance of the uncinat processes is a rounded-point, triangular-shaped process projecting superiorly from the lateral aspect of the vertebral body. This gives the characteristic “saddle” appearance of the typical cervical vertebra. Its shape can vary significantly or it may not present.

When significant spondylosis or degenerative changes are present, the uncinat processes may initially appear more pointed (15). Later, they become bulbous and blunted and show other signs of hypertrophy of lateral spur formation (15). (Fig. 2) Obviously, degenerative changes to the uncinat process will occur in combination with generalized degenerative changes of that motion unit, and there will be other signs of degeneration such as disc space thinning. The shadow of a spondylosis uncinat process combined with disc thinning may give the appearance of a vertebral body fracture – Mach band – on the lateral view (2,5,10). This occurs most commonly in the mid-cervical spine, in particular, C5. (5,10) Significant arthrosis of the uncinat processes may present a radiolucent line on the A-P and oblique films that is actually a Mach band and gives the appearance of a fracture line. There will likely be sclerotic margins bordering the pseudofracture line. (14)

Clinically, it is wise to closely observe the uncinat processes/uncovertebral joints on the A-P x-ray for signs of fracture or degenerative changes. In degeneration, spur formation may project into the adjacent lateral recess or intervertebral foramen and lead to spinal nerve root radicular presentations. (3,15) In a few cases, it might

cause ischemia to the nearby vertebral artery or adjacent arterioles.

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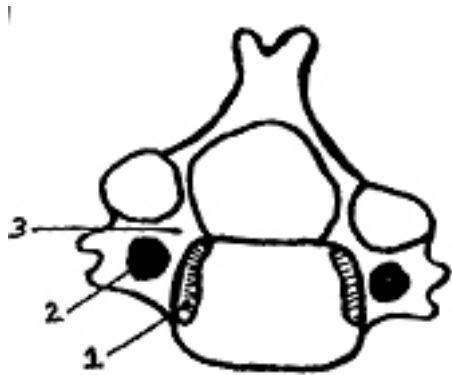


FIG. 1: S-I view of a typical cervical vertebra
 1. Uncinate process
 2. Transverse foramen
 3. Intervertebral canal



FIG. 2: A-P lower cervical view (inverse image)
 A. Degenerated C6 uncinate process.
 B. Relatively normal appearing C5 uncinate process.

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