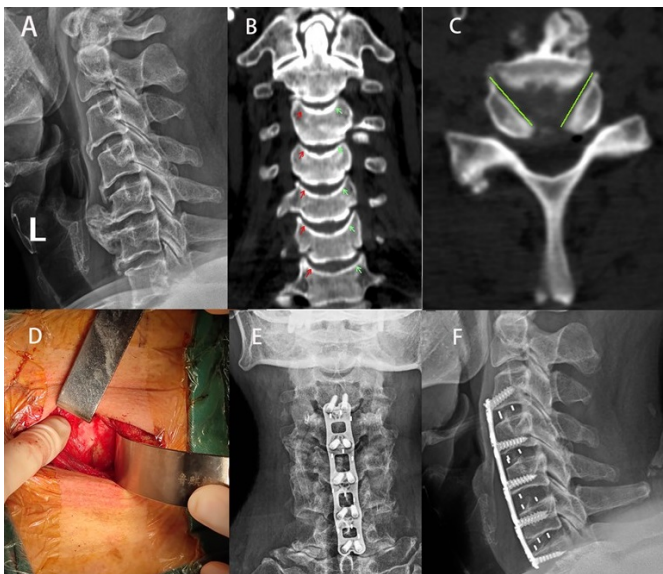


# Uncinate Process Inner Margins Guide Rapid and Midline Placement of a Multilevel Plate in Cervical Vertebrae with Severe Anterior Osteophyte

Sir,

A 60-year male patient diagnosed with cervical spondylotic myelopathy and dysphagia had a prior history of diffuse idiopathic skeletal hyperostosis (DISH). X-ray showed a huge osteophyte on the ventral cervical spine (Figure 1A). CT showed the Luschka joints were symmetrical (Figure 1B, C). A multilevel anterior cervical discectomy and fusion (ACDF) from C3 to C7 was performed by the Smith-Robinson approach. The longus colli muscle was seriously affected by a huge osteophyte (Figure 1D). The Caspar distractor was set following the removal of osteophytes.



**Figure 1:** Images and intraoperative photographs of the multilevel anterior cervical plate placement procedure. (A) Huge osteophytes on the vertebrae's anterior surface in a multilevel cervical disorder patient with DISH from a lateral view x-ray. (B) Coronal CT view showing that the inner margins of uncinates on the right side (red arrows) and left side (green arrows) were clear and symmetrical at all levels. (C) Horizontal CT view showing that the inner margins of uncinates processes, which use reliable anatomical markers (green lines), were clear and symmetrical even at the biggest hyperplastic osteophyte level. (D) Osteophytes obscured the medial borders of the longus colli muscles from the intraoperative photograph. (E) Anterior-posterior view of cervical fixation. (F) Lateral view of cervical fixation.

The discectomy and decompression on the lowest level were performed. Subsequently, the midline was identified utilising the Luschka joint in the intervertebral space. Although the longus colli muscles were obscured by those osteophytes, the

inner margins of the uncinates processes at the Luschka joints were clearly visible after cervical discectomy. They were regarded as an anatomical marker to guide the placement of cages. The first cage was centrally implanted into the lowest space. Discectomies and cage placements at the superior level were then performed sequentially in the same way. The anterior surface was smoothed by a high-speed burr. Using the central holes of cages as reference points, a plate was positioned on the cervical column with all cages' central holes aligned. Screws were placed from bottom to top, pair by pair. The plate-screw-cervical constructs were checked by a one-time anterior-posterior fluoroscopic view (Figure 1E, F).

Some technique notes were introduced. For multilevel exposures, extensive subplatysmal dissection is essential. The insertion of the anesthesia-related breathing tube through the nose rather than the mouth during the long segment fixation involves the C2/3 level. Screws were placed level by level, rather than side to side, to avoid plate misalignment. A high-speed burr is more stable for screw opening and establishment of screw trajectories, which helps mitigate the risk of lateral plate shift, particularly in the vertebral body with hard cortical bone due to osteophytes.

It is not easy to quickly and properly place a long cervical plate. Traditionally, the longus colli muscle serves as the most frequently used anatomical landmark for the identification of the cervical midline.<sup>1</sup> However, it is not precise in cases with severe anterior osteophyte conditions. Although the uncinates process may become hypertrophic as degeneration changes, this pathology always happens at the outer margins rather than the inner margins of the uncinates processes.<sup>2</sup>

The inner margins of the uncinates processes at the Luschka joint can serve as a reliable landmark to guide quick and midline placement of a multilevel plate on the cervical vertebrae when a severe anterior osteophyte affects the anatomy of the longus colli muscle.

## COMPETING INTEREST:

The authors declared no conflict of interest.

## AUTHORS' CONTRIBUTION:

JW, FT, QL: Drafting of the manuscript.

QL, JW: Conception, design of the study, and operation.

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