BONE-MARROW-PIT OF THE PEDICLE INSIDE OF VERTEBRAL BODY: ITS UTILITY AS ANATOMICAL LANDMARK FOR ANTERIOR APPROACH TO THE CERVICAL SPINAL CANAL
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INTRODUCTION: Vertebral artery laceration by the penetration of the lateral wall of the cervical vertebral body has been known as a serious complication of the anterior approach to the cervical spinal canal. The base of uncinate process has been recommended as an anatomical landmark to designate the location of the lateral corner of the spinal canal, however, it can not become a definitely reliable landmark because it does not locate on the covering roof, i.e. the posterior wall, of the spinal canal. The purpose of this study is to obtain a reliable anatomical landmark in entering the lateral corner of the cervical spinal canal in the anterior approach, definitely avoiding vertebral artery laceration by penetration of the lateral wall of the vertebral body.

METHODS: Anatomical characteristics of the position of the base of pedicle inside the cervical vertebral body and its relative position to the contents in the underlying spinal canal were investigated using five cadavers. In a clinical study (Fig. 1), operative findings and pre- and post-operative CT-scan findings were analyzed to check the utility of the bone-marrow-pit of the pedicle (BMPP) to enter the lateral border of the spinal canal in the anterior decompression for the OPLL in two cases.

RESULTS: Base of the pedicle was identified easily and clearly as a bone-marrow-pit on the posterior wall of the cervical vertebral body both in cadavers and clinical cases. In cadaveric study, BMPP always stood medial to the vertebral artery, defining the lateral border of the spinal canal. BMPPs belonged to the second quarter zone of the vertebral body in C3-C5, and to the first quarter zone in C6-C7. Mean values of internal diameter of BMPP and distances between bilateral BMPPs were 5.4 mm and 22.7 mm respectively at C2-C7 vertebral level. In clinical cases, postoperative CT scan findings demonstrated its utility as a landmark in approaching the lateral corner of the spinal canal.

CONCLUSION: BMPP inside the vertebral body can be a definitely reliable anatomical landmark in approaching the lateral corner of the cervical spinal canal via vertebral body, avoiding the vertebral artery laceration by the penetration of the lateral wall of the cervical vertebral body.
Fig 1. Operative procedure in clinical study.
A central gutter of 1.5 cm in width was made using a high-speed air drill in each vertebral body contained in the required extent of decompression. Then, using a curette, removal of cancellous bone was proceeded to the lateral wall along the gutter bottom to expose the BMPP, at the level of radiologically predetermined appropriate zone in each vertebral body.