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EVALUATION OF C1 VERTEBRA AND V3 SEGMENT OF VERTEBRAL ARTERY FOR POSTERIOR SURGICAL APPROACHES: A CADAVERIC STUDY

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AMAÇ: Many techniques are established for the treatment of the upper cervical spine instabilities to avoid persistent instability and neurological complications. The screw placement in the atlas vertebra via the posterior arch and lateral mass needs shorter operative time and significantly reduce intraoperative blood loss. The aim of this study is to evaluate the posterior anatomy of the atlas and to establish anatomic landmarks for locating the entry point on the posterior arch of the atlas.

YÖNTEM: This study was performed on twelve formaldehyde fixed cadaveric head and neck specimens with colored silicon filled vessels obtained from Laboratory of the Anatomy Department of Dokuz Eylul University School of Medicine. Cervical regions were dissected posteriorly until the cervical vertebrae were seen and muscles were completely removed. Related bone structures of C1 vertebra and its neighbourhood to the vertebral artery at the craniovertebral junction were evaluated morphometrically and data were obtained.

BULGULAR: Measurements of posterior bone structures of C1 vertebra and vertebral artery (VA) were performed on right and left sides and analyzed statistically. The width and height of inferior articular process (IAP) 10.21±0.81 mm and 4.35±0.76 mm, respectively. The height of posterior arch at most nearest point to IAP was 5.70±0.77 mm, the total height of superior articular process (SAP) and IAP 17.48±1.14 mm. The length end height of sulcus arteria vertebralis were 16.65±1.07 mm and 9.21±1.52, respectively. The width, thickness and height of posterior arch was 57.57±8.65 mm 9.01±0.96 mm and 9.59±1.50 mm, respectively. The inner and outer lengths of posterior arch was 33.71±4.35 mm and 27.14±6.63 mm, respectively. The distance between the posterior tubercle and medial border of tansverse foramen was 35.35±5.02 mm. The distance between the midline and medial border of vertebral artery during its course in tansverse foramen and in vertebral artery groove were 16.15±1.92 mm and 29.06±1.93 mm, respectively. The distance between the medial borders of right and left vertebral ertery was 55.89±3.49 mm. The diamater of vertebral artery at vertebral artery groove was 4.60±0.51 mm.

SONUÇ: The transarticular screws which pass through the C1–C2 articulation provides stability but up to 23 % of the cases, safe placement of these transarticular screws is impossible due to high risk of vertebral artery injury. Although VA injury is a rare complication of superior cervical posterior fixation, the consequences may cause serious complications such as arteriovenous fistula, pseudoaneurysm, hemorrhage, VA thrombosis, cerebellum, brain stem ischemia, and even death. We conclude that our study will provide data for accurate and safe screw placement in the atlas vertebra.

Anahtar Kelimeler: atlas, cervical spine, posterior cervical spinal approach, vertebral artery