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Thennekoon C.Y., Ahamed Faleel A.F.

VARIANT ANATOMY OF SIGMOID SINUS GROOVE AND JUGULAR FORAMEN

Tutor: PhD, associate professor Pasiuk H.A.
Department of Human Anatomy
Belarusian State Medical University, Minsk

Actuality. The sigmoid sinus is a paired Dural venous sinus that drains blood from the cranial cavity into the internal jugular vein. It begins near the Jugular foramen (JF), a bony aperture between occipital and temporal bones where the internal jugular vein originates. The JF may be subdivided into three parts: the anteromedial part transmits the inferior petrosal sinus, the intermediate part transmits the glossopharyngeal nerve, the vagus and the accessory nerves, the posterolateral compartment transmits the sigmoid sinus and some meningeal branches from the occipital artery and ascending pharyngeal artery. An understanding of the morphological variations of the sigmoid sinus and JF holds significant importance in neurosurgical and otological procedures. These variations directly influence surgical outcomes in posterior cranial fossa interventions, affecting the risk of complications such as venous hemorrhage and cranial nerve injury.

Aim: to establish the variations in the morphology and morphometrics of the groove for sigmoid sinus and JF in humans depending on the skull type.

Materials and methods. Study was conducted with 24 adult human skulls from the Department of Normal Anatomy BSMU. The craniometric parameters, including the length and width of the skulls, were measured using a pelvimeter. Based on the calculated cranial index, the skulls were classified into three cranial types. The width and length of the JF were measured using a Vernier caliper. To facilitate accurate measurement, the width of the JF was divided into three parts: anteromedial (W1), intermediate (W2) and posterolateral (W3). The groove for the sigmoid sinus (SSG) was studied by creating molds using molding clay, allowing for a detailed analysis of its shape. A flexible copper wire was molded along the groove to assist in measuring its length, after which the wire was straightened and its length recorded. Furthermore, morphological and statistical methods were used.

Results and their discussion. Types of skulls were identified using Skull index: brachycranic (83,33%, n=20), mesocranic (12,5%, n=3), and dolichocranic (4,17%, n = 1).

The JF was examined and classified into five morphological types based on the number of angles and sides observed: Quadrangular, Triangular, Oval, Circular and Irregular. When comparing the shapes of the jugular foramina, the right side showed 7 (29%) quadrangular, 5(21%) triangular, 9 (37.5%) oval, 3 (12.5%) circular, and 0 irregular foramina. On the left side, there were 6 (25%) quadrangular, 7 (29%) triangular, 9(37.5%) oval, 0 circular and 2(8%) irregular foramina. The lengths of the right JF 13,35 (12,50; 15,00) mm was compared with that of the left JF 13,00 (12,00 ;14,50) mm and there was no statistically significant difference noted. The widths of the right JF 5,00 (4,25; 6,75) mm is differ from the left JF 5,00 (4,75 ;6,25) mm (z=2,0, p=0,04).

Three distinct parts of SSG were identified: the descending part, the horizontal part, and the ascending part. Additionally, a strong positive correlation was found between the lengths of the horizontal parts of the right ((14,5 (13,00p; 20,00) mm) and left ((14,00 (12,00; 19,00) mm) sigmoid sinus grooves (r = 0.767), as well as between the right JF (W3) and the horizontal part of the right SSG (r = 0.719).

Conclusion. The shapes of the jugular foramina varied between sides, with the right side showing a higher proportion of oval and quadrangular foramina, while the left side had more triangular and irregular shapes. These findings suggest potential anatomical bilateral asymmetries in JF dimensions, which may have implications for neurovascular and surgical studies.