

STRUCTURE OF THE BRAIN SECTION OF THE HEAD

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Annotation: The work studied the border separating the head from the neck and the layers of the frontal-parietal-occipital region. It is shown that the head area consists of the frontal-parietal-occipital, temple, mastoid, cheek, and parotid-chewing part, orbital, nasal, oral part and deep area of the face. These studies are necessary for conducting in a certain sequence surgeon's knife

Keywords: border, head, neck, forehead, face, surgeon, deep, horizon, topography, mastoid, tissue, cerebral vein, vein, bone.

Introduction

The head is an open and most individual part of the human body, which requires extensive knowledge of each section, area, layer and vascular-nerve formation.

The head is separated from the neck by a border that begins at the mental protrusion (protuberantia mentalis) and then runs along the lower edge of the base of the lower jaw (basis mandibulae) to its angle (angulus mandibulae), and then upward to the posterior edge of the branch of the lower jaw (ramus mandibulae), reaching the external auditory opening (porus acusticus externus) and passing through the mastoid process (processus mastoideus), to the superior nuchal line (linea nuchae superior) and ends on the external occipital protuberance (protuberantia occipital externally).

On this formation it connects with such a line on the opposite side.

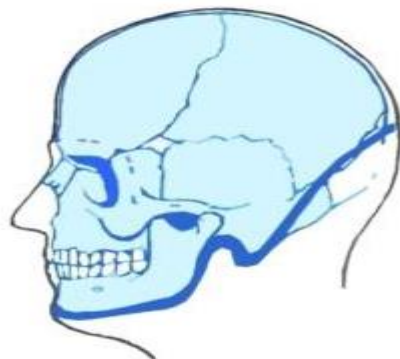


Fig. 1. The border separating the head from the neck.

The head has two large sections: the cerebral (pars cerebralis), which contains the brain and facial (pars facialis), which contains the organs of vision and smell. The boundary between them is determined by an imaginary line drawn from the bridge of the nose (glabella), along the supraorbital



margin (*margo supraorbitalis*), and then along the posterior edge of the zygomatic process (*processus zygomaticus*), frontal process of the zygomatic bone (*processus frontalis*) and horizontally along the zygomatic arch (*arcus zygomaticus*) to the external auditory opening (*porus acusticus externus*). This line has a continuation on the opposite side.

The cranium can be divided into the vault (*calvaria*) and the base (*basis cranii*).

The boundary between them is a plane that runs through the supraorbital margin (*margo supraorbitalis*) and the external occipital protuberance (*protuberantia occipital externally*).

The head (skull) during measurements and clinical examination (X-ray, computed tomography, nuclear magnetic resonance imaging, ultrasound, etc.) must be positioned in a standard horizontal plane (Frankfurt or oculomotor plane), which is drawn through the lower edge of the orbit (*orbitae*) and the upper edge of the external auditory canal (*porus acusticus externus*). This is reflected in Fig. 2.

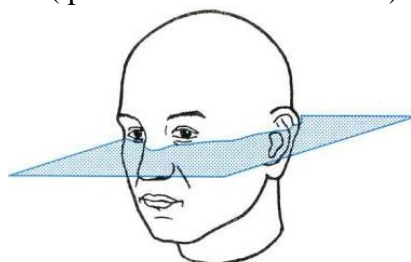


Fig. 2. The generally accepted horizontal (Frankfurt) plane.

Cerebral section of the head: In the topographic (clinical) anatomy of the cerebral section of the head, it is customary to distinguish the following regions: frontal-parietal-occipital (*regio fronto-parieto-occipitalis*); temporal (*regio temporalis*); mammillary (*regio mastoidea*). The last two are paired regions (left and right).

Given the rapid and modern improvement of surgical interventions, the development of reconstructive, plastic and aesthetic surgery, new additional knowledge of the layered topography of each area is necessary (Fig. 3).

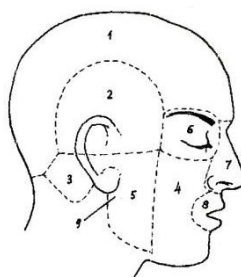


Fig. 3. Head regions : 1 – frontal-parietal-occipital; 2 – temporal; 3 – mastoid; 4 – buccal; 5 – parotid-masticatory; 6 – orbital; 7 - nasal; 8 - oral; 9 - deep area of the face.

Fronto-parieto-occipital region (*regio fronto-parieto-occipitalis* : This is the middle part of the cerebral region of the head, which is separated by the following boundaries: in front - the bridge of the nose and the supraorbital margin (*margo supraorbitalis*); behind - the superior nuchal line (*linea nuchae superior*); on the sides - the upper temporal line (*linea temporalis superior*).

It consists of: the anterior third - the frontal region (*regio frontalis*), which corresponds to the borders of the bone of the same name; the right and left parietal regions (*regio parietalis dextra et sinistra*); which also correspond to the boundaries of these bones; occipital region (*regio occipitalis*) - respectively the occipital bone. There are no differences between the layers of all these areas, so let's consider the general features of the structure.

The study of the layers of this area must be carried out in a certain sequence, as the surgeon's knife passes, namely: skin; subcutaneous tissue; aponeurotic helmet; muscular layer (*mm . frontalis occipitalis*); subgaleal tissue; periosteum; subperiosteal tissue (Fig. 4).



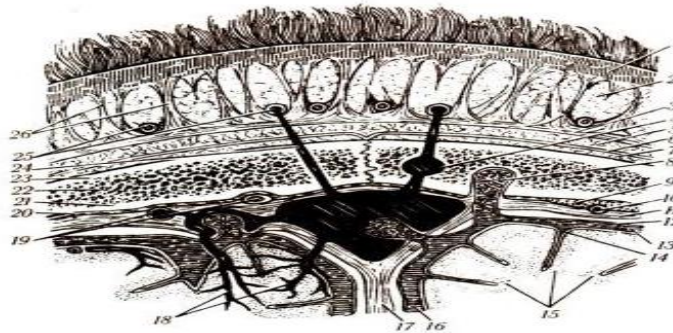


Fig. 4. Layers of the fronto-parieto-occipital region : 1 - skin; 2 - subcutaneous tissue; 3 - aponeurotic helmet; 4 - diploic vein; 5 - subaponeurotic tissue; 6 - periosteum; 7 - subperiosteal tissue; 8 - granulation of the arachnoid membrane; 9 - parietal bone; 10 - middle meningeal artery; 11 - dura mater of the brain; 12 - arachnoid mater of the brain; 13 - cerebrospinal fluid in the subarachnoid space; 14 - pia mater of the brain; 15 - cerebral cortex; 16 - subarachnoid space; 17 - falx cerebri; 18 - cerebral veins; 19 - meningeal artery and vein; 20 - epidural space; 21 - internal plate of the parietal bone; 22 - diploic substance of the bone; 23 - external plate of the parietal bone; 24 - emissary vein; 25 - superficial arteries and veins located in the subcutaneous tissue; 26 - connective tissue bridges.

Otherwise, in this area it is necessary to separate the soft part of the tissue, which is located in three layers:

- 1) skin;
- 2) the musculature of the marked muscles and the flat aponeurosis or aponeurotic helmet;
- 3) thin periosteum on the outer surface of the bones of the arch.

The skin is thick, dense, covered with hair, with a large number of sebaceous and sweat glands, the blockage of which results in the formation of atheromas of various sizes. The thickness of the skin in an adult reaches, on average, 1.0-1.2 cm. The subcutaneous layer of tissue is well expressed over the entire plane of the frontoparietal -occipital region and is divided into separate cells due to vertical connective tissue partitions that go from the deep layer of the skin to the aponeurotic helmet.

Thus, the three described superficial layers in this area are macroscopically united into one layer, which easily contacts the loose subaponeurotic tissue and thin periosteum.

In addition, the subcutaneous fat contains superficial blood vessels, which are closely fused with the connective tissue septa and fibrous septa by their adventitia. The next layer is the aponeurotic helmet (*galea aponeurotica*), otherwise, tendinous, which has the appearance of a flat aponeurosis located between the frontal and occipital muscles (*mm. frontalis occipitalis*).

In the central sections of the layer of the outer surface of the aponeurotic helmet there are fibrous bundles (connective tissue partitions) that are woven into the deep layer of the skin, but on the lower one there are none. In the lateral sections this helmet becomes thinner and gradually passes into the superficial fascia of the temporal region.

It should be remembered that scalp wounds (the human scalp is removed) often appear in head vault injuries, which is associated with the morphological unity of the three surface layers and their easy separation from the periosteum. Under the aponeurotic helmet there is loose eponymous tissue, which lacks fibrous structures.

The periosteum (*pericranium*) is one of the deep layers of soft tissue of the fronto-parieto-occipital region, which covers the bones of the skull, easily separated from them, except for the suture line, where they cannot be separated.

Under this layer is the subperiosteal tissue, which is well expressed within each bone of the cranial vault and is separated by sutures and fusion sites of the periosteum.

The bone structure of this area is made up of the frontal bone (*os frontale*), paired parietal (*os parietale*), occipital (*os occipitale*). They are all flat and consist of a superficial plate (*lamina externa*



), the middle part - spongy (diploicae) and the inner plate (lamina interna) or glassy (lamina) virtea). The latter is easily damaged by blows to the head from various objects and when a person falls.

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