

OSTEOLOGY OF HEAD AND NECK

SUPERIOR ORBITAL FISSURE (SE)

Superior orbital fissure is an elongated fissure that transmits vessels and nerves to and from the orbit.

It is divided by common tendinous ring into three parts- lateral, middle and medial.

Structures passing through superior orbital fissure

Lateral part

- Lacrimal nerve
- Frontal nerve
- trochlear nerve
- Superior ophthalmic vein

Middle part

- Upper and lower divisions of oculomotor nerve,
- nasociliary nerve
- abducent nerve

Medial part

- Inferior ophthalmic vein

HYOID BONE (SE)

Hyoid bone is "U" shaped bone in the upper part of neck. It is suspended by muscles and ligaments. It has body, lesser cornu, and greater cornu.

Body

It is the central thickend part.

Attachments

Geniohyoid and mylohyoid , omohyoid, thyrohyoid and genioglossus muscles.

Lesser cornu

Small projection at the junction of body and greater cornu.

Attachments

Stylohyoid ligament and part of middle constrictor

Greater cornu

Projects posterolaterally from the body and ends in a tubercle.

Attachments

Hyoglossus and middle constrictor

Development of hyoid bone

- Upper part of body and lesser cornua develop from 2nd branchial arch mesenchyme
- Lower part of body and greater cornua develop from 3rd branchial arch mesenchyme

PAIRED CRANIAL BONES (SA)

In the adult paired cranial bones are

Parietal, temporal, maxillae, zygomatic bones, ethmoid, lacrimal, palatine, nasal and inferior conchae.

ANTERIOR FONTANELLE (SA)

Anterior fontanelle) of the fetal or infant skull comprises of a diamond shaped soft membranous gap between the frontal and parietal bones at the junction of coronal and sagittal suture.

Fontanelles allow for rapid stretching and deformation of the cranium as the brain expands faster than the surrounding bone can grow.

Anterior fontanelle close between 9 months to 1/12 years after birth

Clinical importance

A very tense or bulging anterior fontanelle indicates raised intracranial pressure eg hydrocephalus.

A sunken (also called "depressed") fontanel indicates dehydration or malnutrition.

Fontanelles allow the infant brain to be imaged using ultrasonography

Premature complete ossification of the sutures is called craniosynostosis.

ASTERION (SA)

The point on the surface of the skull where the lambdoid, parietomastoid, and occipitomastoid sutures meet is known as asterion

The asterion has become important in neurosurgery. Surgeons use it as a measurement for safe entrance into the skull during operations, such as the removal of tumors like meningiomas.

Another common operation is for treating stenosis, or narrowing, of the lambdoid suture.

PTERION (SA)

The pterion is located on the side of the skull, just behind the temple. It is the junction between four bones:

The parietal bone

The squamous part of temporal bone

The greater wing of sphenoid bone

The frontal bone

Clinical importance

The pterion is known as the weakest part of the skull.

The anterior division of the middle meningeal artery runs underneath the pterion. Consequently, a traumatic blow to the pterion may rupture the middle meningeal artery causing an epidural haematoma.

The pterion may also be fractured indirectly by blows to the top or back of the head that place sufficient force on the skull to fracture the pterion.

ATTACHMENTS OF MASTOID PROCESS (SA)

Mastoid process is a rounded downward projection of the temporal bone.

Its medial part is notched called mastoid notch.

Attachments

Sternomastoid

Splenius capitis

Longissimus capitis

Posterior belly of digastric muscle at the mastoid notch.

BREGMA (SA)

Bregma is the anatomical point on the skull at which the coronal suture is intersected perpendicularly by the sagittal suture.

Development

The bregma is known as the anterior fontanelle during infancy. The anterior fontanelle is membranous and closes in the first 36 months of life.

Clinical Significance

In the congenital disorder cleidocranial dysostosis, the anterior fontanelle never closes to form the bregma.

The bregma is often used as a reference point for stereotactic surgery of the brain.

Also, examination of an infant includes palpating the anterior fontanelle.

A sunken fontanelle indicates dehydration, whereas a very tense or bulging anterior fontanelle indicates raised intracranial pressure.

BONES OF HARD PALATE (SA)

Hard palate is a partition between nasal and oral cavities.

Anterior 2/3rd is formed by palatine processes of maxillae

Posterior 1/3rd is formed by the horizontal processes of palatine bone.

FETAL SKULL (SA)

In the fetal skull the cranium is proportionately larger than the facial skeleton.

Characteristic features

Fontanellae

there are 6 fontanellae present at the angles of parietal bones. Anterior fontanelle is most prominent.

Mastoid process

Not developed until the 2nd year. Facial nerve lies in a superficial plane.

Paranasal air sinuses

Frontal air sinus is absent at birth. Maxillary air sinus is rudimentary.

Mandible and frontal bones are separated by sutures in the midline.

LIGAMENTS OF ATLAS (SA)

The atlas has an anterior arch and posterior arch with anterior and posterior tubercles.

The lateral masses possess superior and inferior articular processes and transverse processes

Attachments

Anterior tubercle

Anterior longitudinal ligament

Posterior tubercle

ligamentum nuchae

Tubercle on lateral mass

Transverse ligament of atlas

Upper border of anterior arch

Anterior atlanto-occipital membrane

Upper border of posterior arch

Posterior atlanto-occipital membrane

FORAMINA IN CRANIAL FOSSAE (SA)

Foramina in anterior cranial fossa

Cribriform plate of ethmoid bone

Optic nerve

Middle cranial fossa

Superior orbital foramen

Foramen rotundum

Foramen ovale

Foramen spinosum

Foramen lacerum

Posterior cranial fossa

Internal auditory meatus

Jugular foramen

Hypoglossal canal

Foramen magnum

Mastoid foramen