Newborn skull

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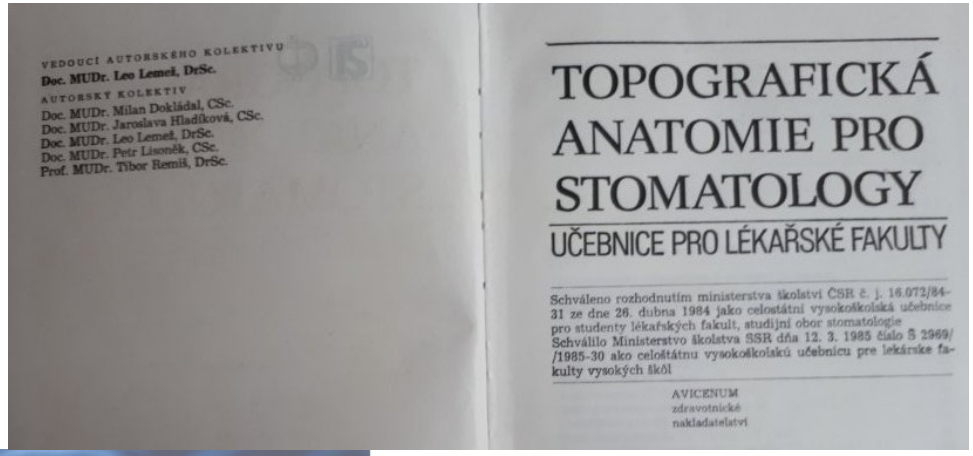
Literature:



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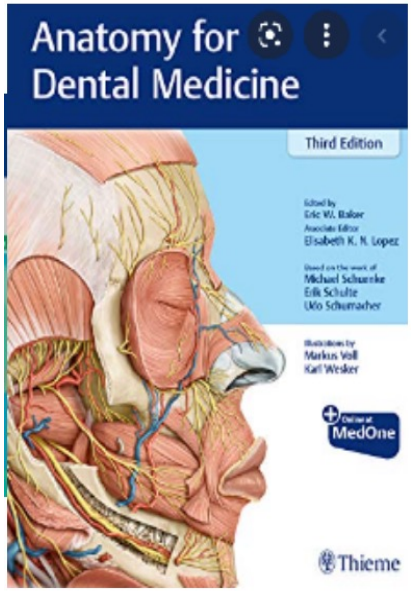
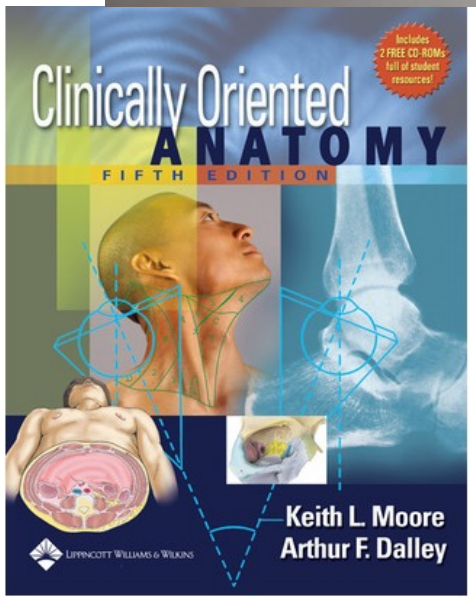
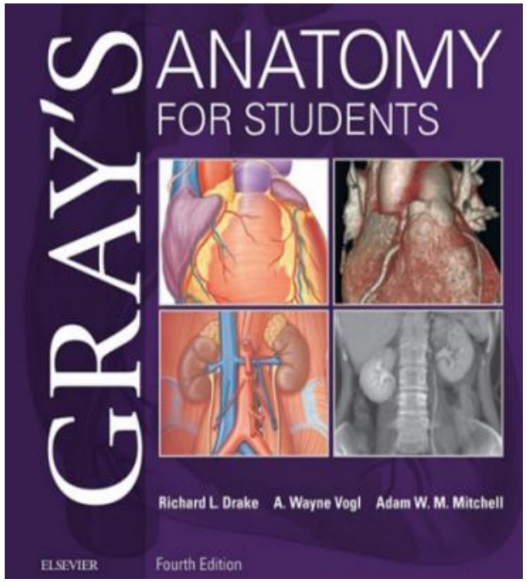






The newborn skull, compared with the adult skull, has a disproportionately large cranium relative to the face – large neurocranium and shortand small splanchnocranium. In childhood, the growth of the mandible, the maxillary sinuses, and the alveolar processes of the maxillae results in a great increase in length of the face.

Length : 11 cm, circumference: 34 cm

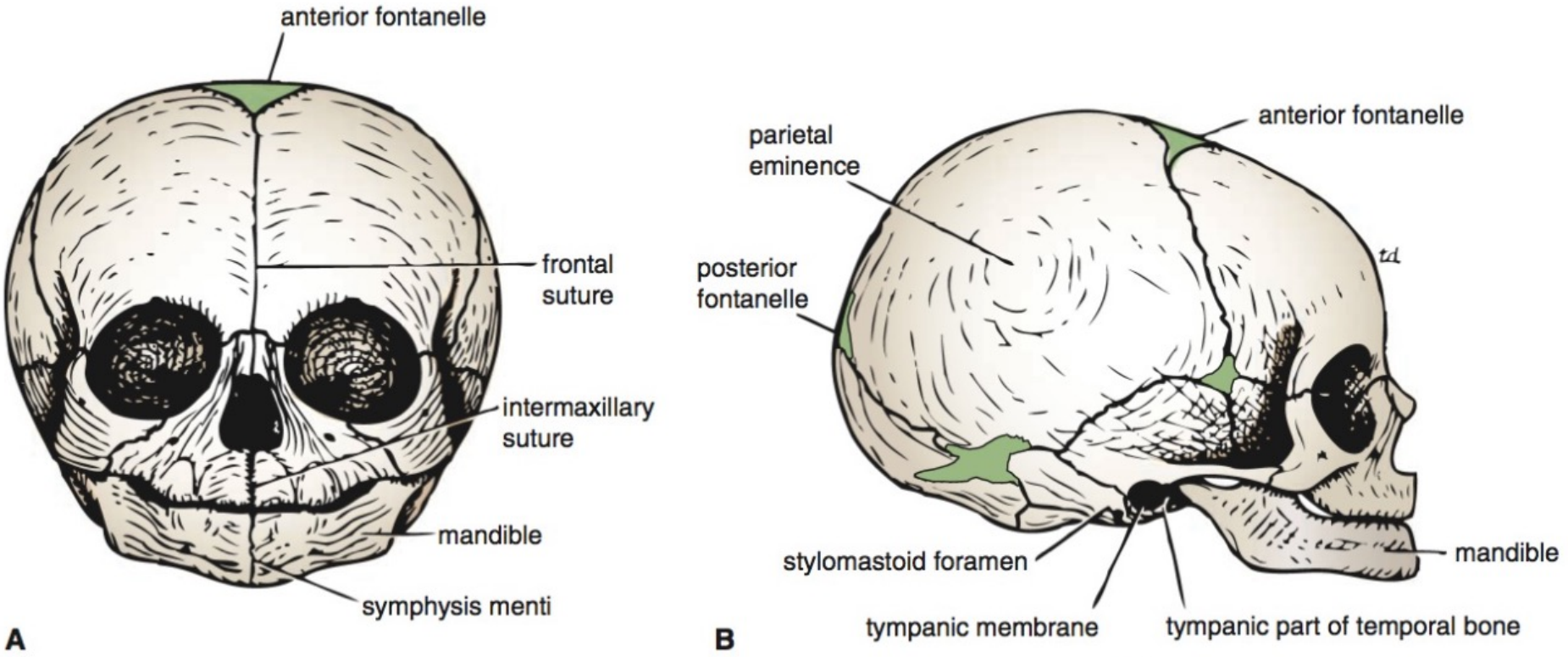
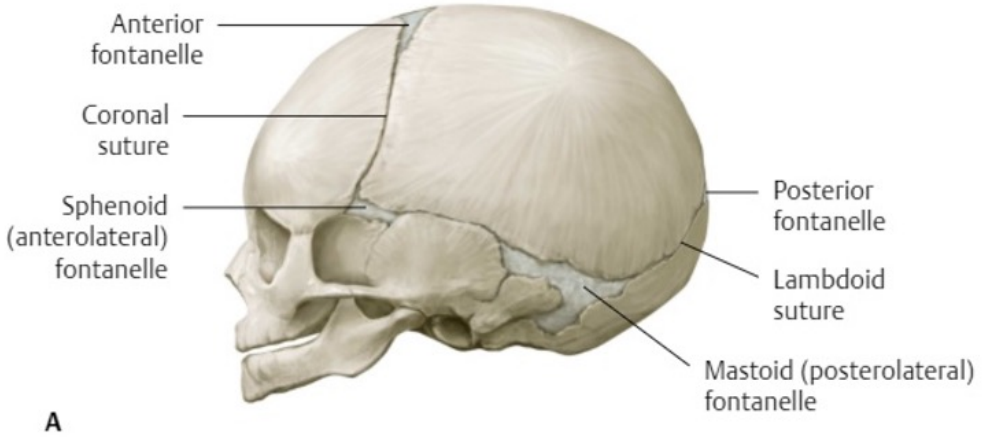


FIGURE 11.8 Neonatal skull as seen from the anterior **(A)** and lateral **(B)** aspects.

The bones of the skull are smooth and unilaminar, there being no diploë present.
Most of the skull bones are ossified at birth, but the process is incomplete, and the bones are mobile on each other, being connected by fibrous tissue or cartilage.
The bones of the vault are not closely knit at sutures, as in the adult, but are separated by unossified membranous intervals called fontanelles.



The anterior(major) fontanelle is diamond shaped and lies between the two halves of the frontal bone in front and the two parietal bones behind – at the contact point of sagittal, coronal and frontal sutures. The fibrous membrane forming the floor of the anterior fontanelle is replaced by bone and is closed by 18 months of age.

The posterior (minor) fontanelle is triangular and lies between the two parietal bones in front and the occipital bone behind – at the contact point of lambdoid and sagittal sutures.Closed by 3 months of age.

The sphenoidal (anterolateral) fontanelle has an irregularly square shape in the temporal region

The mastoidal (posterolateral) fontanelle irreagularly shaped where the occipital, parietal and temporal bones meet.

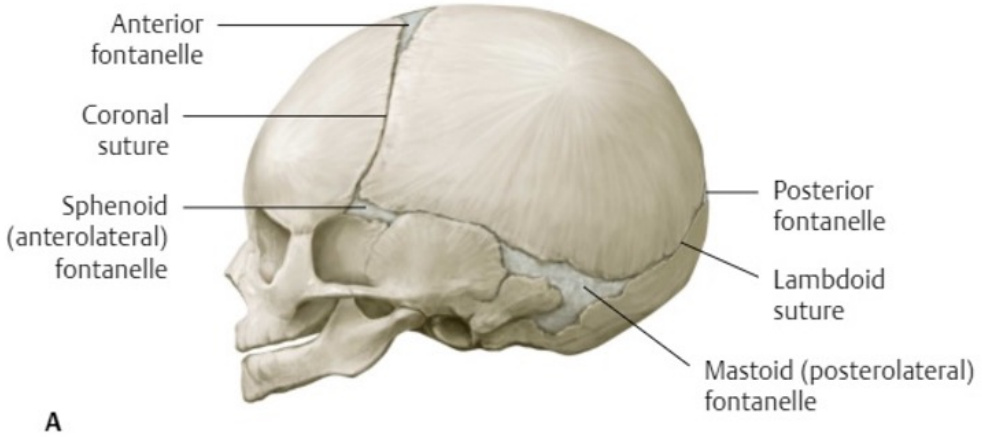


Table 2.1 **Closure of sutures and fontanelles**

Fontanelle	Age at closure	Suture	Age at ossification
1 Posterior fontanelle	2–3 months (lambda)	Frontal suture	Childhood
2 Sphenoid (anterolateral) fontanelles	6 months (pterion)	Sagittal suture	20–30 years old
2 Mastoid (posterolateral) fontanelles	18 months (asterion)	Coronal suture	30–40 years old
1 Anterior fontanelle	36 months (bregma)	Lambdoid suture	40–50 years old

The tympanic part of the temporal bone is almost have a ring shape – **anulus tympanicus** at birth, compared with a C-shaped curved plate in the adult. This means that the external auditory meatus is almost entirely cartilaginous in the newborn, and the tympanic membrane is nearer the surface.

Large tubera frontalia et parietalia – beginning of ossification

The **mastoid process is not present** at birth and develops later in response to the pull of the sternocleidomastoid muscle when the child moves his or her head.

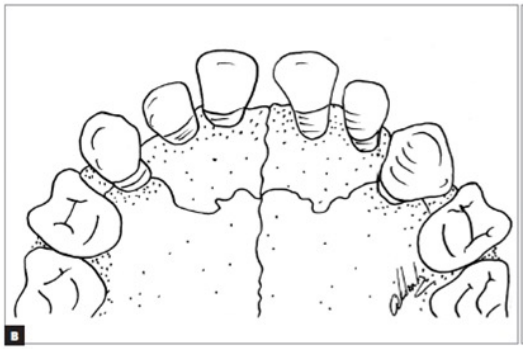
The mandible has right and left halves at birth, united in the midline with fibrous tissue. The two halves fuse at the **symphysis menti by the end of the 1st year.**

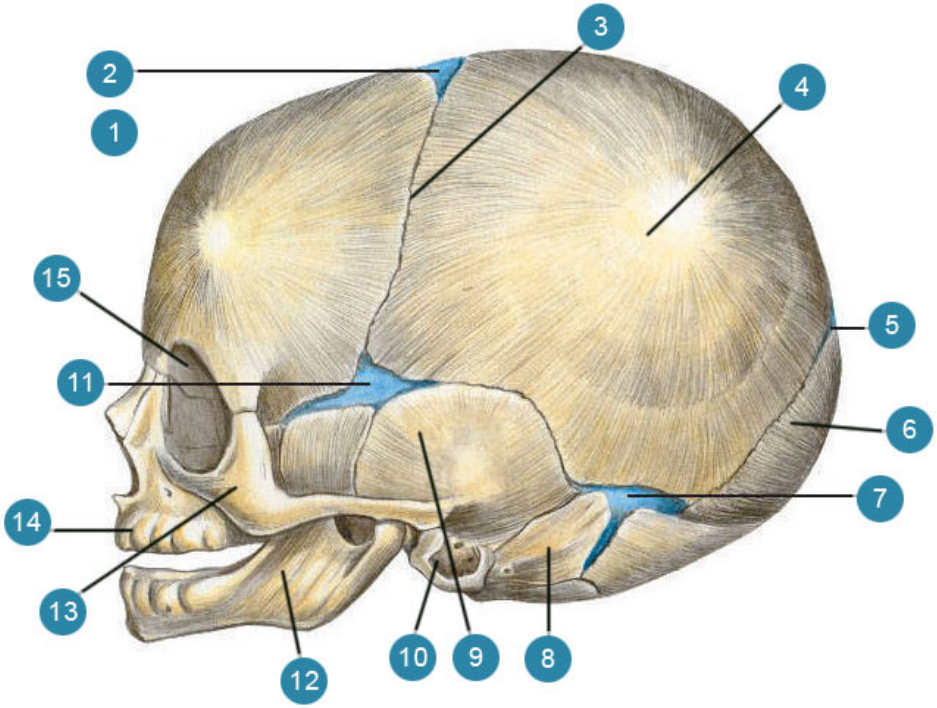
The angle of the mandible at birth is **obtuse 150-160°**, the head being placed level with the upper margin of the body and the coronoid process lying at a superior level to the head. It is only after eruption of the permanent teeth that the angle of the mandible assumes the adult shape and the head and neck grow so that the head comes to lie higher than the coronoid process.

In old age, the size of the mandible is reduced when the teeth are lost. As the alveolar part of the bone becomes smaller, the ramus becomes oblique in position so that the head is bent posteriorly

Paranasal sinuses are not developed

Premaxilla (incisive bone) Visible suture between maxilla and premaxilla – incisive suture (The anterior part of the maxilla, bearing the incisive teeth, is referred to as the premaxilla (incisive bone) when this part was independent and later fused with the maxilla).





Age-related changes in the mandible

The structure of the mandible is greatly influenced by the alveolar process the teeth. Because the angle of the mandible adapts to changes in the alveolar process, the angle between the body and ramus also varies with age-related changes in the dentition. The angle measures approximately 150 degrees at birth and approximately 120 to 130 degrees in adults, decreasing to 140 degrees in the edentulous mandible of old age.

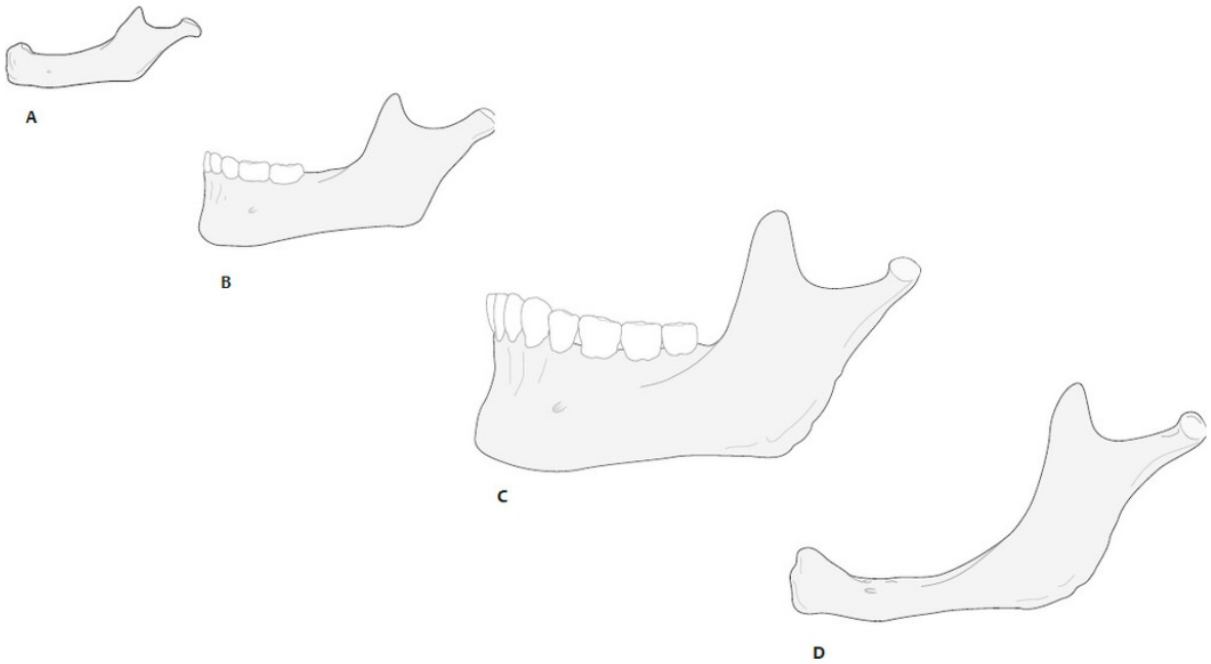
A) At birth the mandible is without teeth, and the alveolar process has not yet formed.

B) In children the mandible bears the deciduous teeth. The alveolar process is still relatively poorly developed because the deciduous teeth are considerably smaller than the permanent teeth.

C) In adults the mandible bears the permanent teeth, and the alveolar process is fully developed.

D) In old age, the mandible can be edentulous (toothless), with accompanying resorption of the alveolar process.

Note: The resorption of the alveolar process with age leads to a change in the position of the mental foramen (which is normally located below the second premolar tooth, as in **C**). This change must be taken into account in surgery or dissections involving the **mental nerve**.



Clinical Features of the Neonatal Skull Fontanelles

- Palpation of the fontanelles enables the physician to determine the progress of growth in the surrounding bones, the degree of hydration of the baby (e.g., if the fontanelles are depressed below the surface, the baby is dehydrated), and the state of the intracranial pressure (a bulging fontanelle indi- cates raised intracranial pressure.
- Samples of cerebrospinal fluid can be obtained by passing a long needle obliquely through the anterior fontanelle into the subarachnoid space or even into the lateral ventricle.
- Clinically, it is usually not possible to palpate the anterior fontanelle after 18 months, because the frontal and parietal bones have enlarged to close the gap.
- Forceps Delivery and the Facial Nerve: In the newborn infant, the mastoid process is not developed, and the facial nerve, as it emerges from the stylomastoid foramen, is close to the surface. Thus, it can be damaged by forceps in a difficult delivery.