

# Temporal bone

The **temporal bone** is a paired, structurally complex bone on the side of the skull, containing numerous sensory organs and important structures. It was created by combining several parts of different origins.

## Anatomical structures

### Pars petrosa

The rock bone (pyramid) is sometimes referred to separately as the **bone of the os petrosum**. It is a formation similar to a quadrilateral pyramid that protrudes laterally from the back in the ventromedial direction. It contains a complicated cavity space, the so-called **labyrinthus osseus** (bony labyrinth), in which the sensory organs of hearing and balance are stored. The pyramid is also associated with the prominent **processus mastoideus** - a nipple-shaped projection protruding caudally together with the **processus styloideus** - a spike-shaped projection. Both ossify chondrogenically and are important attachments of some muscles.

The os petrosum with its tip, apex pyramidis, nests between the occipital bone and the ala major of the wedge-shaped bone. The bones here are connected by cartilaginous synchondrosis sphenopetrosa and petrooccipitalis. When maceration of the skull, instead of cartilaginous connections, it is referred to as foramen lacerum.

The individual surfaces of the pyramid are referred to:

- **facies anterior** - area perpendicular to the scale of the temporal bone, oriented obliquely forward and upwards;
- **facies posterior** - vertically built, almost parallel to the position of the scale (thus perpendicular to the anterior surface), looking towards the cerebellum;
- The boundary between them is formed by the sharp Margo Superior;
- **facies inferior (basalis)** - lower surface;
- **facies ventrobasalis** - part of the middle ear cavity, normally covered by the os tympanicum.

On individual surfaces we can find many formations. Here is a list of the most important of them:

### Facies anterior

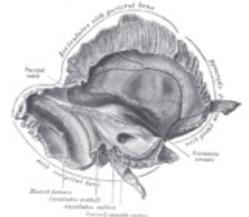
- **impressio trigemini** - the socket for the ganglion semilunare of the trigeminal nerve is evident at the apex of the pyramid;
- **sulcus nervi petrosi majoris et minoris** - two small grooves for given nerves, laterally from the impressio;
- **eminentia arcuata** - a more dorsal bulge caused by the course of the anterior semicircular canal of the inner ear;

### Facies posterior

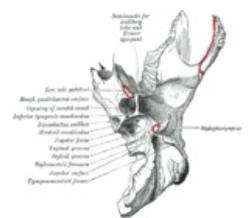
- **porus acusticus internus** - conspicuous socket for entering the internal ear canal;
- fossa subarcuata - depression in position analogous to eminentia arcuata;
- margo posterior partis petrosae - rozhraní facies posterior a inferior;
  - here is present **incisura jugularis** - complements with the occipital bone foramen jugulare;

### Facies inferior

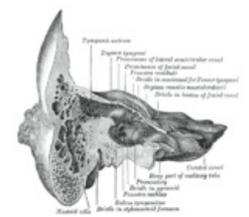
- entrance of the **canalis caroticus** — for A. carotis interna, which passes through the bone and exits on the opening in the apex partis petrosae;
- **fossa jugularis** - a hole behind the carotid canal following the incisura jugularis, where the v. jugularis interna begins;
- **proc. styloideus**;
- **Foramen stylomastoideum** - output for N. facialis from Canalis facialis, output is stored between Proc. mastoideus and styloideus;
- incisura mastoidea - groove for the beginning of the posterior belly of M. digastricus;
- foramen mastoideum - the hole behind why. Mastoideus for the venous junction to the sigmoid sinus.



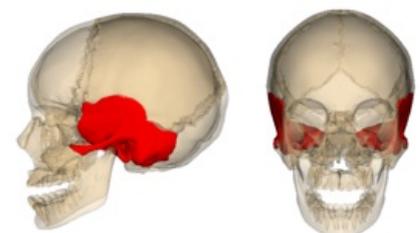
Left temporal bone from the inside



Left temporal bone from below



Coronal (frontal) section



Storage of the temporal bone in the skull

### Facies ventrobasalis

Coronal (frontal) incision This part of the bone can be seen only after removal of the tympanic axis that covers it. It contains mainly **cavitas tympanica**, or middle ear cavity;

- **Promontorium** is a rounded bulge in the middle of the area protruding into the middle ear cavity, it is raised by the first coil of the cochlea. It contains two holes:
  - **fenestra vestibuli** (ovalis) – upper opening at the beginning of the cochlea, stirrup rests here;
  - **Fenestra cochleae** (rotunda) – lower opening in vivo closed by blank.

In the ventromedial direction (or apex) runs the cavitas tympanica in the **canalis musculotubarius** – a channel containing the muscular tensioner of the tympanic membrane and communication with the Eustachian tube. It is divided by a bone septum.

In the opposite direction, the cavitas tympanica ends in the cavity of the **antrum mastoideum**, which continues to the proc. Mastoideus tiny cellulae mastoideae.

## Pars squamosa

The scale of the temporal bone, to which the pyramid is attached. It is set cranially in the cranial vault and connected to other bones in the **suture squamosa** (scaly suture). From the temporal bone protrudes from here:

- a pronounced processus zygomaticus forming with the cheekbone arcus zygomaticus – yoke arch;
- On the underside there is a fossa mandibularis for the connection of the lower jaw with the rest of the skull.

## Pars tympanica

The tympanic bone is conical in shape and forms the wall of the external ear canal. It continues its course to the pyramid, where it closes the middle ear cavity. Placement of the temporal bone in the skull

## The most common variations

Variations are often affected by the pars squamosa and the formations adjacent to it. These are mainly defects of scales and the absence of bone material, which is replaced by connective tissue, as well as the division of the scale by the seam, why proc. Frontalis inserted between the ALA major of the cuneiform bone and the os frontale (here the connection of the ala major with the frontal bone cannot be realized) and various openings for arterial or venous connections.

## Links

### Related Articles

- Bones neurocrania
- Development of the auditory and balance system
- Ear

### External links

- Mefanet [http://mefanet.lfp.cuni.cz/clanky.php?aid3=16%7CKost spánková](http://mefanet.lfp.cuni.cz/clanky.php?aid3=16%7CKost%20sp%C3%A1nkov%C3%A1)

### Bibliography

- ČIHÁK, Radomír – GRIM, Miloš. *Anatomie*. 2. upr. a dopl. edition. Praha : Grada Publishing, 2001. 497 pp. vol. 1. ISBN 80-7169-970-5.