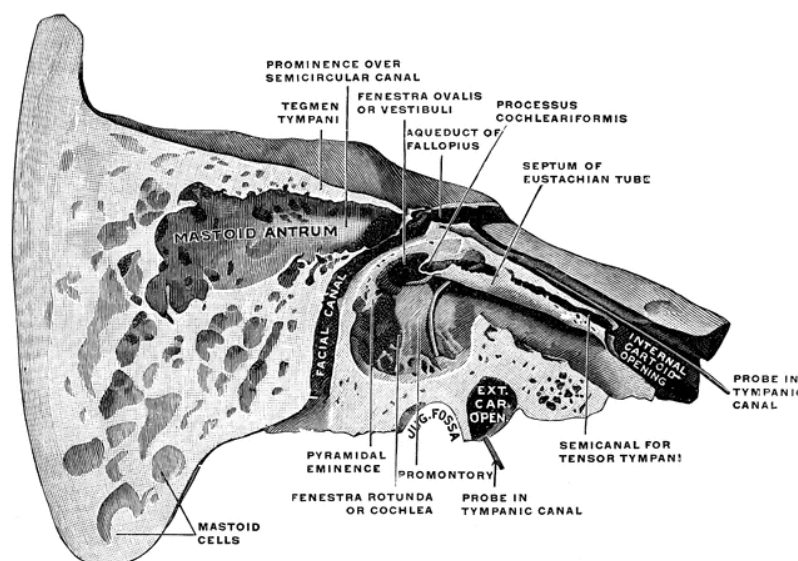


Petrus Bone



The surgical anatomy of the petrous [bone](#) is difficult to learn and imagine due to its porous structure. Obviously, the surgeon's training is based on [cadaver dissections](#) as we are still lacking good, versatile models of the [temporal bone](#) and its important structures. The clearly visible, rapid development of computer science provides us with new possibilities that should be immediately engaged in modeling and simulating the human anatomy ¹⁾.

The petrous portion of the [temporal bone](#) or pyramid is pyramidal and is wedged in at the [skull base](#) between the [sphenoid](#) and [occipital bones](#).

The petrous portion is among the most basal elements of the skull and forms part of the endocranium.

Petrus comes from the Latin word petrosus, meaning "stone-like, hard". It is one of the most dense bones in the body.

Directed medially, forward, and a little upward, it presents for examination a base, an apex ([petrous apex](#)), three surfaces, and three angles, and contains, in its interior, the essential parts of the organ of hearing.

The petrous part is probably the most complex one. It is compact and encloses the semicircular, [internal auditory canal](#), facial and [carotid canal](#). Houses the [carotid artery](#) as it ascends in its vertical portion before its anteromedial bend. In addition, the [sigmoid sinus](#), [jugular bulb](#), vestibulocochlear apparatus, and [facial nerve](#) are encased within the [mastoid](#) ²⁾.

Parts

Anterior petrous bone or petrous apex, and the [posterior petrous bone](#) where the mastoid antrum and cells lie.

Neurosurgical aspects

[Vestibular schwannomas](#) cause significant distortion of the petrous bone anatomy. Detailed preoperative knowledge of the topography is necessary for the preservation of function ³⁾

Presurgical evaluation of the petrous bone in [trigeminal neuralgia](#) is also important, because the neurovascular compression site may not be exposed sufficiently by the [suprameatal tubercle](#) in approximately 5% of the patients ⁴⁾.

The higher incidence of [cerebrospinal fluid fistulas](#) in men compared with women can be explained by means of differently pneumatized petrous bones. A high amount of petrous bone pneumatization has to be considered as a risk factor for the development of postoperative CSF fistula after vestibular schwannoma surgery ⁵⁾.

CT precisely depicted the complex anatomy of the air cells in the petrous bone. Cerebrospinal fluid (CSF) [rhinorrhea](#) is the most common complication after skull base surgery for cerebellopontine angle tumors. Air cells in the petrous bone provide the route for CSF rhinorrhea. Therefore, CT assessment of the air cells is useful for preventing this complication ⁶⁾.

The limits in the safe removal of the posterior wall of the IAC are not generally agreed on. To address this problem, Day et al. performed a morphometric analysis of 32 fixed cadaveric temporal bones by microsurgical dissection and measurement with fine-cut bone window computed tomographic (CT) scans. The morphometric relationships of identifiable surface landmarks were first determined. Fine cut bone window CT scans were next performed on each bone and the distances between the fundus, the vestibule, and the common crus (CC) with the internal auditory meatus (IAM) were determined. Additionally, the thickness of the bone overlying the posterior semicircular canal at the CC was measured. From a retrosigmoid trajectory, employing a 4-cm craniotomy, the posterior wall of the IAC was removed with a high-speed drill, limiting removal to the distance from the vestibule to the IAM, as determined by CT measurement. Preservation of the integrity of deep structures was confirmed by inspection. The length of the actual IAC unroofed was measured and was compared with the IAC length, from IAM to fundus, measured by CT. The average canal length by CT measured 10.0 mm +/- 1.8 (range, 6.6-14.0). The length of the canal uncovered averaged 5.9 mm +/- 1.4 (4.0-8.5) ⁷⁾.

Trauma to the petrous bone may cause [facial palsy](#) and [deafness](#), and CSF leakage with otorrhoea or paradox [rhinoliqorrhoea](#).

Drilling into the petrous bone of the IAC can expose petrous air cells, which can potentially result in a fistulous tract to the nasopharynx manifesting as cerebrospinal fluid (CSF) rhinorrhea.

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