

The occipital bone has squamous, basilar and lateral (condylar) parts, forms the back and base of the skull and encloses the foramen magnum. The squamous part of the occipital bone is the expanded plate of bone located postero-superior to the foramen magnum. The plate is convex externally and concave internally. It articulates with the parietal bones at the lambdoid suture supero-laterally and the temporal bone at the occipitomastoid suture infero-laterally. The postero-superior squamous part is convex externally and exhibits the external occipital protuberance in the midline, midway between the summit and the foramen magnum. The highest and superior nuchal lines pass laterally on each side of the occipital protuberance. Inferior to this and in the midline lies the external occipital crest; the inferior nuchal lines pass laterally from the crest's midpoint.

The **foramen magnum** is a large and ovoid opening in the floor of the posterior cranial fossa. The lateral parts of the occipital bone surround it laterally, the squamous part posteriorly and the basilar part anteriorly, where the opening is narrowed by the occipital condyles. The anterior part is positioned above the dens of C2 (axis) and the posterior part communicates with the vertebral foramen (canal). The foramen magnum transmits the vertebral arteries, the anterior and posterior spinal arteries, the spinal part of the accessory nerve (XI cranial nerve), and is where the spinal cord becomes continuous with the **medulla oblongata**.

The basilar part of the occipital bone extends anteriorly from the foramen magnum to the sphenoid bone. The two bones eventually fuse by the age of 25 years. The lateral parts of the occipital bone lie lateral to the foramen magnum and articulate with the temporal bones. Located on the inferior surface are oval condyles, which articulate with the superior facets of C1 (atlas). Anterior to the condyles are the hypoglossal canals and posterior lay the condylar fossae, which are occasionally perforated by the condylar canals. Postero-laterally to the condyles lie the quadrilateral jugular processes, which are indented anteriorly by the jugular notches. The sigmoid sinus grooves the superior surface of the jugular process and an oval jugular tubercle overlies the hypoglossal canal.

### **Atlanto-Occipital joint**

The atlanto-occipital joint is made up of the occipital condyles and the superior articular facets of C1 (atlas). These facets lie on the lateral masses, which have a corresponding inferior facet for articulation with C2 (axis). The atlanto-occipital joint is essentially a uni-planar joint, with a sliding and rolling action between the components. Flexion and extension are the predominant movements and there is some lateral flexion.

### **Ossification**

Above the highest nuchal line the occipital bone ossifies in membrane (intra-membranous ossification) from two centers, which appear in the second month in-utero. The remainder of the bone ossifies endochondrally; the basilar part from a single center, which appears in the sixth week in-utero and the squamous part from two centers, which soon unite, appearing in the seventh week. Each lateral part ossifies in the eighth week from a single center. By the end of the second year the squamous and lateral parts have united, by the sixth year the basilar part has also fused, forming a single bone.