SKELETAL SYSTEM LAB ADDENDUM: FETAL SKULL

PURPOSE. In this exercise, you will study the skull of a near term fetus and compare it to an adult skull.

INSTRUCTIONS. Read the following explanations and find the described features on the fetal skull and the adult skull from your study bone set.

Craniofacial Proportions. Babies have little bodies topped with a head notable for a large brain case, large eyes, a small face, and a nose set between the eyes. If you compare the fetal skull to the adult skull, you will see why this is so. In the fetus, the cranium is noticeably larger than the facial skeleton, which accounts for only about one-eighth of the height of the skull. In the adult, the differences are much less pronounced because the facial skeleton comprises about one-half the skull height. There are several reasons for this. (1) At birth, the brain and eyes are closer to their adult size than other head structures. Consequently, the cranium enclosing the brain and the orbits enclosing the eyes are large compared to the face. (2) The facial bones (maxillae, mandible, zygomatics, etc.) are not as far along in development as the cranial bones. They will undergo relatively more post natal growth. (3) The teeth have not erupted and added their height to the face. The “puffy” look of the fetal maxillae and mandible is caused by the developing teeth. (4) The ramus of the mandible is relatively short. It will increase significantly in height. (5) As the facial bones grow, the nose will be “pulled” inferiorly. Only its root will remain between the eyes.

Fontanels. Initially, a sheet of mesenchyme, a primitive connective tissue, surrounds the developing brain. As development progresses, some of the mesenchymal cells differentiate into osteoblasts and form ossification centers in the sheet. Bone formation spreads radially from each center, replacing the membrane with bone and forming the parietal bones and the squamous parts of the occipital, temporal, and frontal bones. The frontal bone has two centers of ossification and develops in two halves separated by a temporary suture, the frontal or metopic. If you look at the fetal skull closely, you should see a slightly raised “bump” in the middle of each parietal bone and in each half of the frontal bone. These are the locations of the original ossification centers. You should be able to find the same areas on the adult skull and palpate them on your own head. They are usually more prominent in males.

At birth, angular patches of the original membrane are still present at six sites on the cranium. These unossified areas are called fontanels or fontanelles (“little fountains”), presumably because they “pulse” with changes in intracranial pressure. The largest is the diamond-shaped anterior fontanel, located at the junction of the sagittal, coronal, and frontal sutures. It is commonly called the baby’s “soft spot.” A smaller triangular posterior fontanel is situated at the junction of the sagittal and lambdoidal sutures. The remaining four fontanels are quite small and are paired on either side of the cranium. The sphenoidal or anterolateral fontanels are located at the anterolateral angles of the parietal bones (the junction of the frontal, parietal, and greater wing of the sphenoid); the mastoid or posterolateral fontanels are located at posterolateral angles of the parietal bones (the junction of the mastoid part of the temporal, the parietal, and the occipital). The mastoid, sphenoidal, and posterior fontanels disappear within the first month or two after birth; the anterior fontanel, within 12 to 18 months.
KEY TO PHOTOGRAPHS
F: frontal bone
Fa: anterior fontanel
Fm: mastoid fontanel
Fo: orbital plate of frontal
Fp: posterior fontanel
Fs: sphenoidal fontanel
Ma: mandible
Mx: maxilla
N: nasal bone
O: occipital bone
Oc: occipital condyle
Os: squamous part of occipital
P: parietal bone
Sc: septal cartilage of nose
Sgw: greater wing of sphenoid
Tm: mastoid part of temporal
TMJ: site of jaw joint
Ts: squamous part of temporal
Ty: tympanum (ear drum)
Z: zygomatic bone