

The Mastoid Process and Mastoiditis

The mastoid process is a portion of the temporal bone; we learned about it in Gross Anatomy, passed our exams and went on with our life, not giving this small piece of skeletal anatomical geography much thought for the rest of our professional lives. With the graying of my years, any information about this small area of skeletal anatomy faded into the realm of failed neural network connections. With the advent of cone beam imaging technologies, this portion of the skull is frequently included in the edge of most volumes and subsequently has become more relevant to the complete evaluation of our 3D volumes.

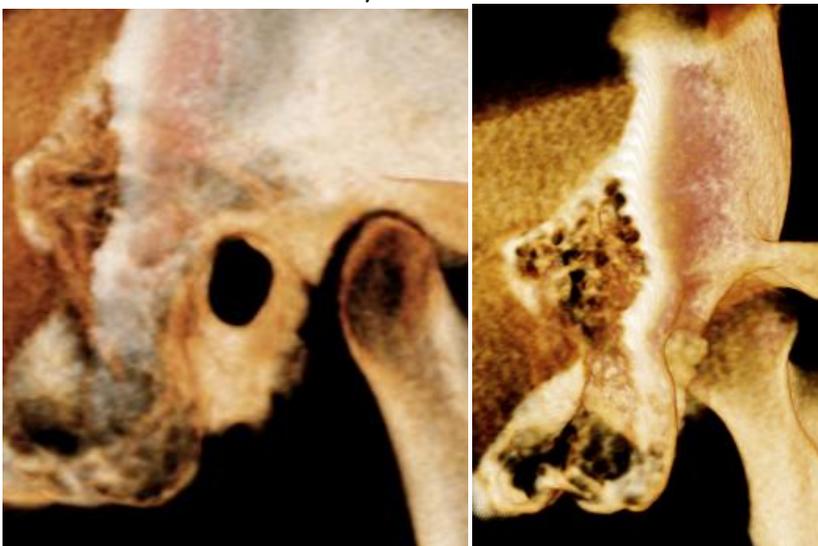
This unique portion of the temporal bone we all learned about is easy to remember because of its intricate make up of closely and finely interwoven air spaces and fine thin bony trabeculae. Anatomically the trabecular pattern carries with it a uniqueness of pattern similar to the delicate ethmoid sinus, exhibiting in each patient a unique pattern. The air cells of the mastoid communicate with air spaces of the middle ear. Because of the communication within the temporal bone between the middle ear and the mastoid air cells; a potential problem may arise within the mastoid process as a consequence of an infection of the middle ear called otitis media.

Middle ear infections infrequently may extend into the mastoid air cells producing either an acute or subacute mastoiditis. If left untreated, or poorly treated, more extreme complications include extra dural brain abscess and lateral sinus thrombosis. Chronic/subacute mastoiditis may result from incomplete treatment of otitis media. Symptoms of mastoiditis may arise several weeks after an untreated middle ear infection and present with inflammation and tenderness over the mastoid. As the infection progresses there may be an anterior displacement of the pinna of the ear or purulent discharge from the ear, otalgia, fever and malaise may be present. Middle ear infections may consist of various types of bacteria, both aerobic and anaerobic and therapy includes a rigorous course of antibiotics.

Over the past several months, among the cases reviewed for 3DDx several cases of possible mastoiditis were identified as incidental radiographic findings secondary to an evaluation of a CBCT volume for implant placement or TMJ assessment. None of the histories provided with the request for the interpretation included anything that would suggest an acute mastoiditis; thus the cases presented are most likely subacute/chronic in nature with minimal overt clinical symptoms.

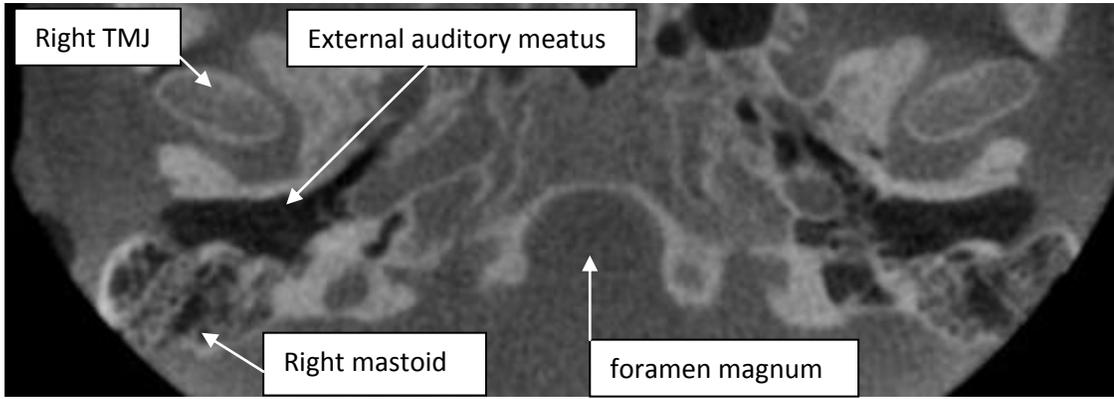
John W. Preece, DDS, MS

Case number 1: a "normal" 28 year old female

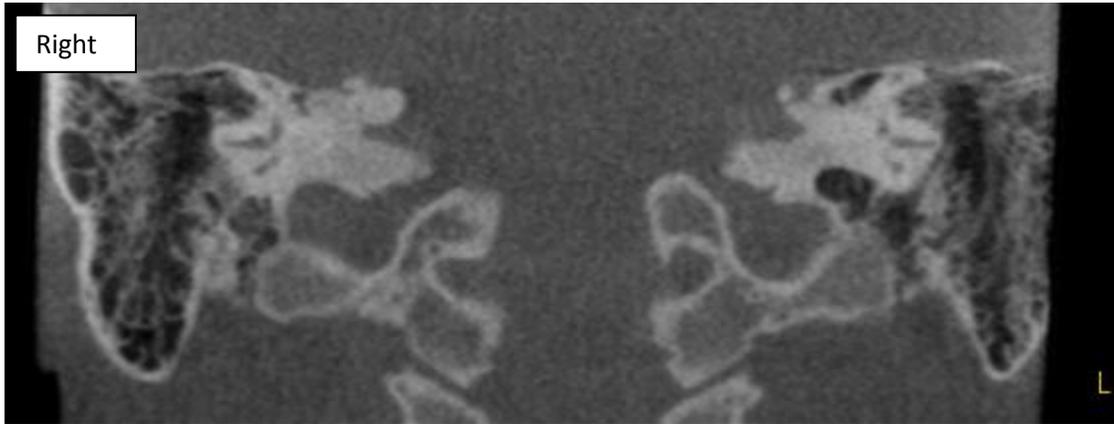


3D rendering of the mastoid process, external auditory canal, TMJ; the oblique view shows the complex arrangement of air cells and trabeculae.

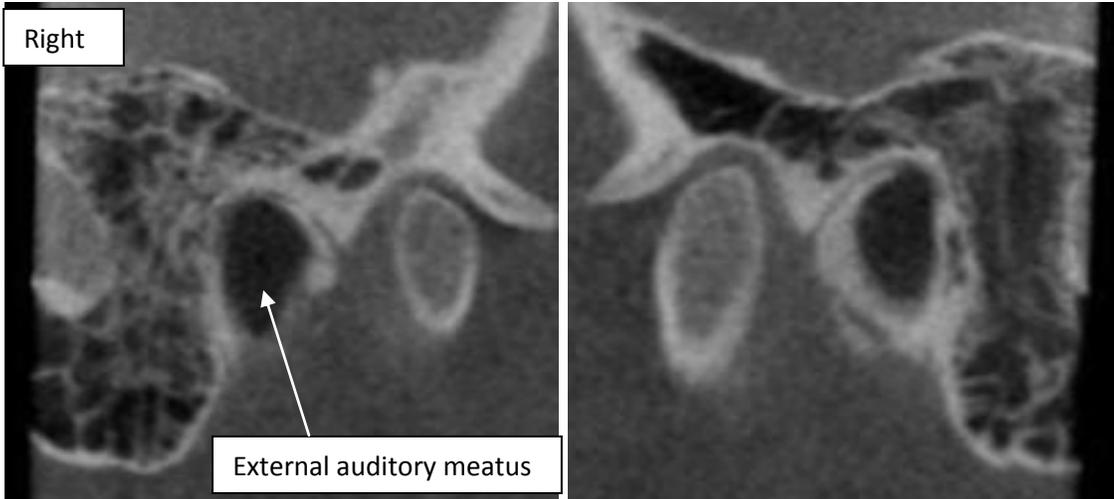
Case number 1: a "normal" 28 year old female



Case 1: axial view



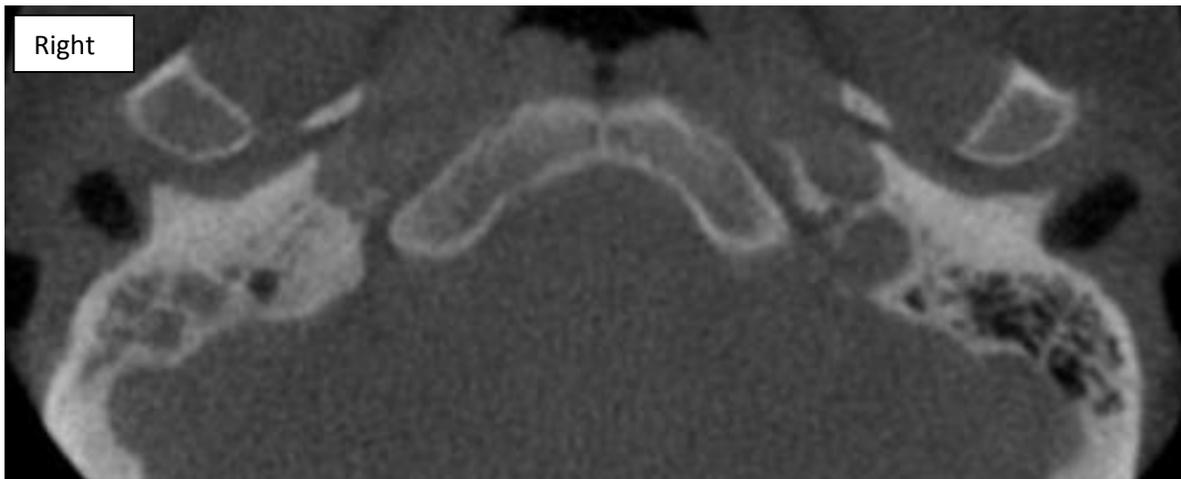
Case 1: coronal view



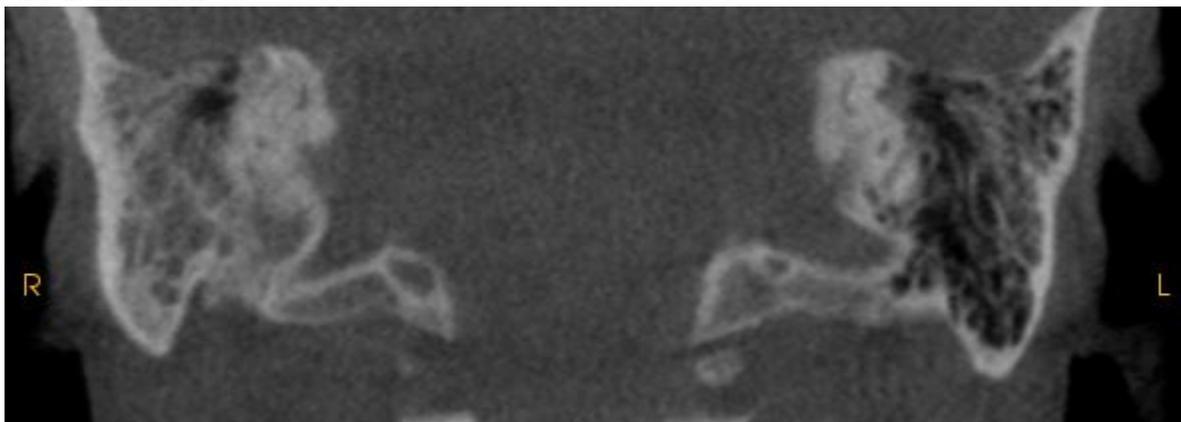
Case 1: sagittal view

Case 2: 59 year old female

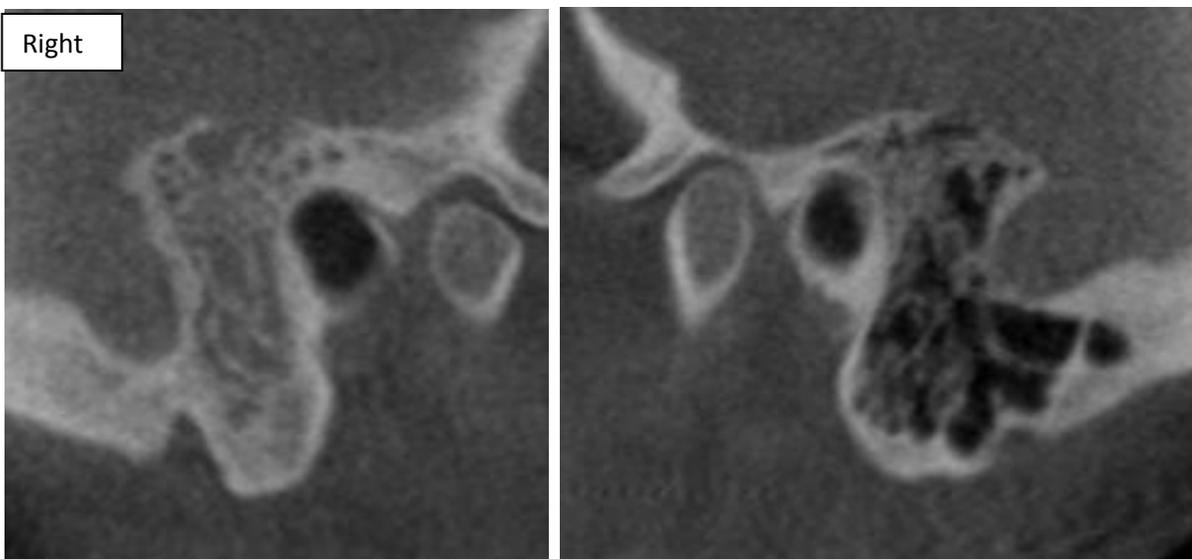
The right mastoid process exhibits an overall increase in density/opacity compared to the left.



Case 2: axial view



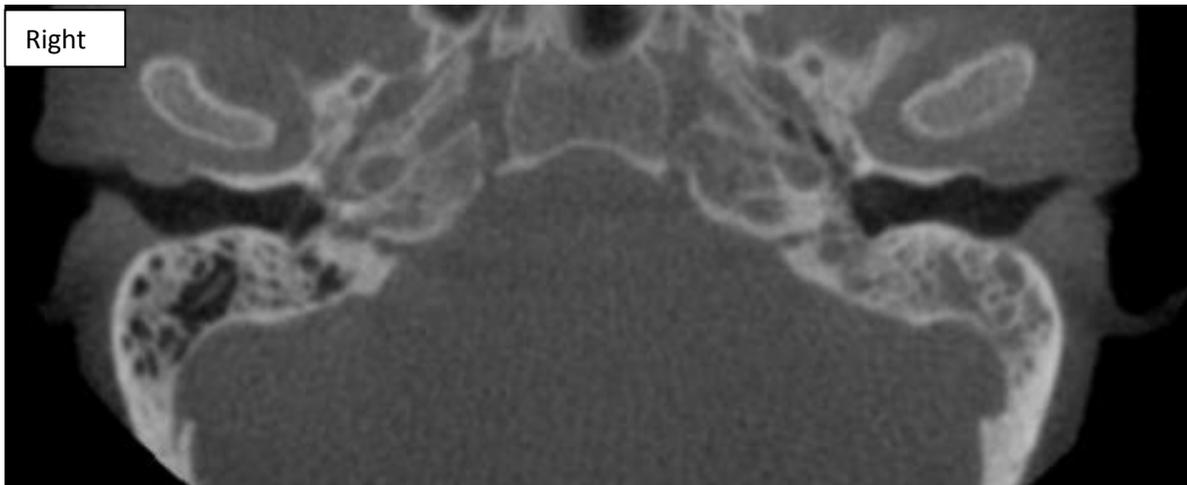
Case 2: coronal view



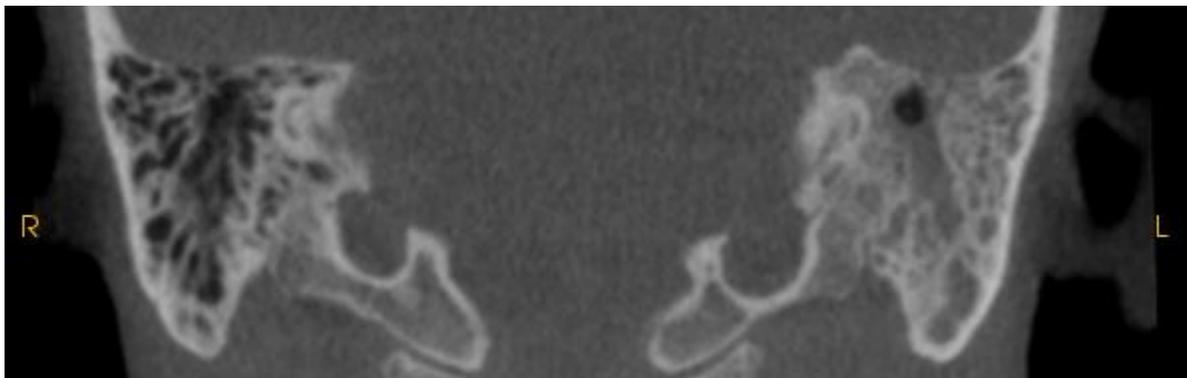
Case 2: sagittal view

Case 3: 45 year old female

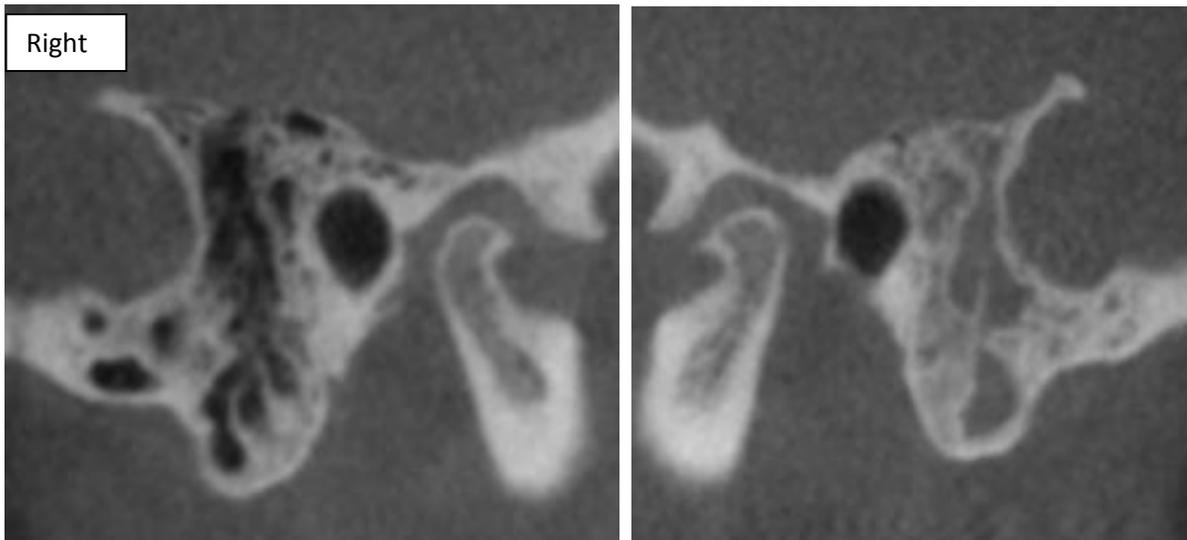
The left mastoid process exhibits an overall increase in density/opacity compared to the right.



Case 3: axial view

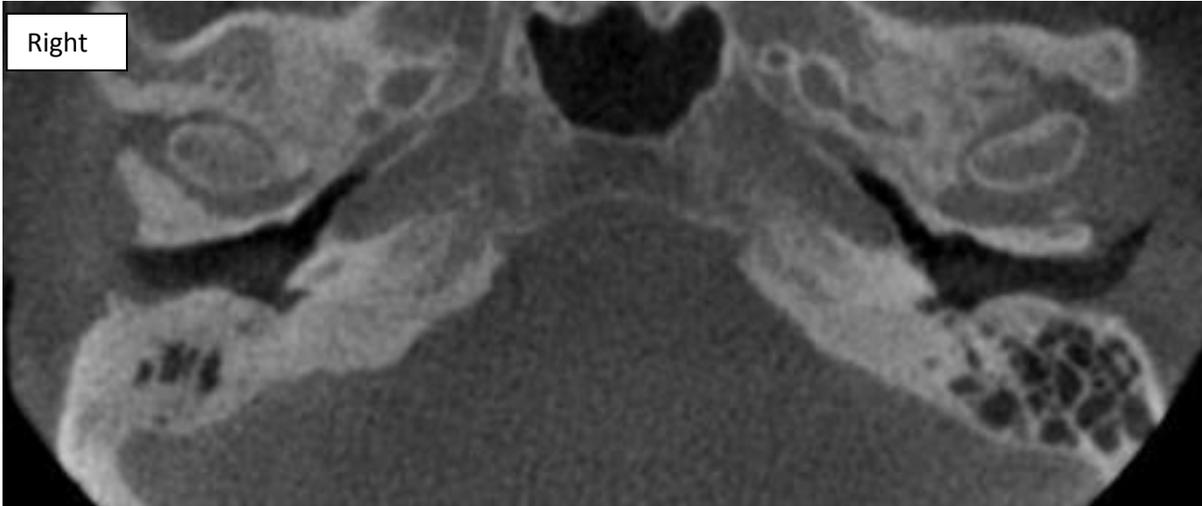


Case 3: coronal view

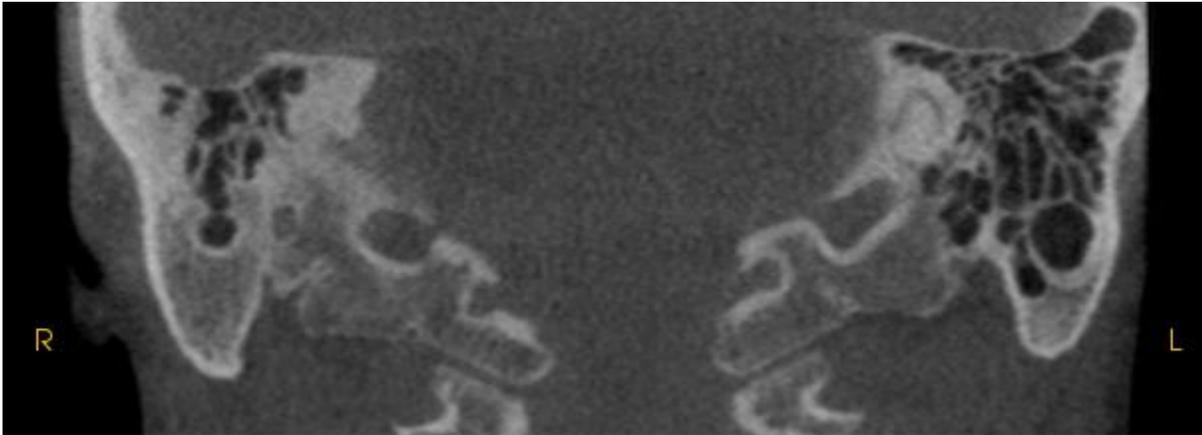


Case 3: sagittal view

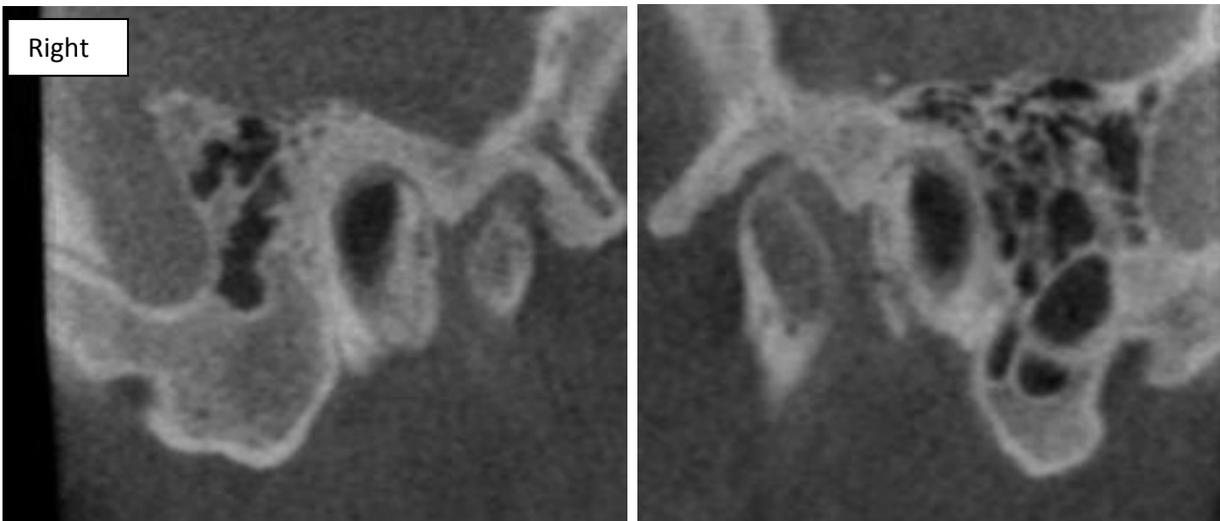
Case 4: a 50 year old female exhibiting an apparent variation in anatomy with the apex of the right mastoid process devoid of air cells



Case 4: axial view



Case 4: coronal view



Case 4: sagittal view