Radiologic Comparison of Density of Mastoid Obliteration vs. Cortical Bone and Otic Capsule

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**Objectives:** Mastoid obliterations are performed for a variety of indications, including chronic otitis media with cholesteatoma. One risk is of masking cholesteatomatous debris, which can subsequently proceed medially and cause suppurative complications. This study hypothesizes that autologous cranial bone graft used as bone pate (BP) in mastoid obliteration is of a lower density than surrounding native bone. This would support the common observation that mastoid obliteration with BP does not have a higher incidence of complications compared to other closed mastoidectomy approaches.

**Study Design:** Retrospective chart review.

**Methods:** From 2005-2009, 210 patients underwent mastoidectomies. Of these, 101 (48%) had mastoid obliterations. Postoperatively, CT scans were performed on 13 patients (14 mastoids) for a variety of indications, including otalgia, headache, or trauma. Radiologic density determination in Hounsfield Units (HU) was performed of the BP, otic capsule adjacent to lateral semicircular canal (LSCC), and the posterior fossa dural plate (DP) in the axial plane.

**Results:** The average HU measurements of the 3 regions was: 1) BP- 572 HU (range 352-850) 2) LSCC- 1671 (range 1527-1913) and 3) DP- 1276 (range of 1036-1714). The difference in the average HU measurement of the BP was significantly less compared to that of the DP or LSCC (P<0.05).

**Conclusions:** The density of bone pate as used to obliterate mastoid cavities is significantly less than that of the surrounding cortical bone and otic capsule. This reduced density may allow recidivistic cholesteatoma to preferentially affect the obliterated bone rather than surrounding native bone, potentially reducing the risk of suppurative complications and disease extension into the labyrinth or intracranial cavity.

**References**