Middle Cranial Fossa Approach to Repair Temporal Bone Tegmen Defects with Autologous and Alloplastic Graft

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Disclosure: none
Introduction: Temporal bone tegmen defects may be associated with cerebrospinal fluid (CSF) otorrhea. A variety of techniques have been used for repair without consensus as to the best method. We report our experience with skull base reconstruction for tegmen defects using either autologous or alloplastic grafts and evaluate the clinical presentations, outcomes, and complications.
Methods: A retrospective chart review was performed on patients with tegmen defects treated from 2007 to 2017. Initially, autologous bone graft was used for skull base reconstruction, but since 2014 we have used an alloplastic graft (Medpor). Primary outcome measures include resolution of CSF leak, symptoms improvements, postoperative infections, and surgical operating time between autologous and allopathic grafts.
**Results:** Thirty patients were surgically treated, with median age 52 (range 26 – 78), 83% females, and median BMI 34.5 (range 23 – 64). Median follow-up was 8.5 months (range 1 – 90). Presenting symptoms included CSF leak (97%), hearing loss (53%), imbalance (13%), meningitis (10%), headache (3%), and tinnitus (3%). Most tegmen defects occurred spontaneously (80%) but cholesteatomas (10%), and trauma (10%) were also identified etiologies. Surgical approaches included middle fossa craniotomy (MFC) only (83%) and combined MFC and mastoidectomy (17%). Both pre- and post-op audiograms were available for 16 patients (53%); of
these, 9 (56%) showed objective improvement.

Fifteen patients were repaired with autologous bone graft (50%), 11 with alloplastic grafts (37%) and 4 with temporalis fascia only (13%). Recurrent CSF leak requiring reoperation occurred in 1 patient (3%). Four patients (13%) suffered wound infections and 3 (10%) had facial and/or petrosal nerve complications. Use of alloplastic graft significantly shortened operative time. Mean operating time was 180 minutes for alloplastic graft compared to 208 minutes for autologous grafts (p = .03).
Discussion: Surgical approach through a middle fossa craniotomy provides adequate exposure of the middle cranial fossa floor to identify all bony dehiscence without significant associated morbidity. Both soft and rigid tissue elements are required to reconstruct tegmen defects. Our experience indicates that using either an autologous or alloplastic graft provides equivalent outcomes and efficacy, although alloplastic graft helps reduce operating time.
**Summary Points:** CSF otorrhea due to tegmen defects can be repaired via a middle fossa craniotomy using either an autologous or alloplastic graft with equivalent outcomes and efficacy, although alloplastic graft helps reduce operating time.