Introduction:
Several modifications to minimal access cochlear implant (MACI) techniques are presented, which help to simplify the procedure, enhance device stabilization, and improve exposure.

Methods:
Review of a prospectively created data base of all cochlear implants done at our center since 2003. Complications such as hematoma, infection, device malfunction, device migration, and extrusion are monitored continuously.

Results:
Out of 104 implants, 101 were done through a minimal access incision. Complications were few, and included stitch abscesses in one patient, device infection in one patient, transient facial nerve paralysis in one patient, and device failure in one patient after head trauma. A compression dressing was used in one patient, and no hematomas occurred. No device migration or extrusion has been observed.

Conclusion:
MACI has a low incidence of complications and is an acceptable alternative method to conventional techniques. The benefits of MACI include less wound tension, less potential for hematoma, less pain, and additional layer closure. The procedure can be simplified by the use of several instruments and methods.

Technique

After marking the location of the receiver and processor, a 4mm linear skin incision is made (similar to that is completely covered by the processor) followed by no intracutaneous incision of skin. The incision is extended to provide complete coverage of the incision by the skin. After incision the subcutaneous tissue is exposed. The subcutaneous tissue is incised in the plane, using cautery, mobilizing the skin and releasing any adhesions. The dermis is then incised with a 5mm linear incision and is sized precisely using a sterilized silicone template. The skin is then freed from the underlying subcutaneous tissue and is retracted anteriorly and posteriorly using the operating room drapes. The skin is then closed in subcutaneous layer with subcuticular (monocryl) suture. The scalp is then closed in a similar fashion.

After making the incision, a posteriorly based, rectangular flap is raised off the mastoid. This flap design allows gapless closure of the incision to reduce the chance of device exposure via the incision. After making the incision, a posteriorly based, rectangular flap is raised off the mastoid. This flap design allows gapless closure of the incision to reduce the chance of device exposure via the incision.

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Additional Details
1. Clindamycin given prior to incision
2. Nerve integrity monitor used
3. Wound closure done in 4 layers: periosteum (vicryl), galea (vicryl), dermis (chromic), and subcuticular (monocryl)
4. No pressure dressing is required
5. Ketorolac 0.5 mg/kg given in PACU
6. Betamethasone with codeine prescribed; most children take for only one day
7. No postoperative antibiotics are given
8. Most patients discharged the same day
9. Activation typically done within 2 weeks, but can be done as early as day 1

Conclusion
1. Minimal access technique for cochlear implantation is safe, efficacious, and cosmetically appealing.
2. Use of the Obergasser trauma retractor and Visio drill help simplify the technique.
3. Tie down sutures at the implant hub and mastoid verge anchor the device effectively; the tight subperiosteal pocket eliminates the need for sutures over the receiver body.
4. Pressure dressings are usually not necessary when performing MACI, possibly because less soft tissue dissection leads to less risk of bleeding.
5. Pain following MACI may be diminished by less cutting and soft tissue dissection.
6. Since no skin flap is created with MACI, complications due to venous congestion, edema, and wound tension are minimized.

References