34% of group B experienced some dizziness. A total of 14% of group A and 10% of group B felt that cochlear implantation had resulted in impaired balance. The DHI scores of 86% of group A (median score 0) and 76% of group B (median score 10) corresponded with low handicap. None of these results differed significantly between groups A and B.

**Conclusion:** While cochlear implantation may result in dizziness, it is almost always short-lived and mild, even when the ear with a stronger caloric response is implanted.

### Otology/Neurotology

#### Saccular Otoconia as a Cause of Ménière Disease

**Hideo Yamane, MD (presenter); Masahiro Takayama**

**Objective:** Idiopathic endolymphatic hydrops can be caused by disturbance of the longitudinal flow of the endolymph in Ménière disease. This study investigated a possibility that the dislodged otoconia from the saccule could be a cause of Ménière disease by occluding the pathway of the endolymph.

**Method:** We examined the ears of 65 patients with definitely diagnosed unilateral Ménière disease based on the criteria proposed by the AAO-HNS and the ears of normal control subjects and cadavers using three-dimensional (3D) cone beam CT by focusing on the vestibule.

**Results:** The images of the reuniting duct and the saccular duct could be categorized by their patency. In the case of Ménière ears, both the reuniting duct and the saccular duct were occluded significantly compared with those of normal ears. The ears of the nonlesional side of Ménière patients also showed the occluded aspects of these ducts. The endolymphatic sinus, which connects to the saccular duct, suggested relations with Ménière attack.

**Conclusion:** Patients with Ménière disease often show a significantly higher incidence of blockage of the reuniting duct and saccular duct. There is a big probability that radiodense substances such as saccular otoconia falling into these ducts may be one of the etiologies of Ménière disease.

### Otology/Neurotology

#### Symptom Timeline Preceding Cochlear Implant Failure

**Brianne Barnett Roby, MD (presenter); Melissa Ferrello, Aud; Frank L. Rimell, MD; Samuel C. Levine, MD; Tina C. Huang, MD, MS**

**Objective:** 1) Review cochlear explants and determine the incidence of device and medical failures. 2) Develop a pattern of symptoms indicating probable implant failure.

**Method:** This is a retrospective chart review at a tertiary referral center. Subjects were selected if they underwent cochlear explantation. A total of 847 implants were performed from 1988 to 2008, with 128 devices explanted. Data were reviewed to determine initial symptom and symptom timeline preceding implant failure.

**Results:** Of total implants, 72% were Advanced Bionic devices, 28% were Nucleus. Overall failure rate was 128 out of 847 (15%). Patients with Advanced Bionic devices underwent 102 explants (16.7% failure rate), with 35% medical failures and 65% device failures. Patients with Nucleus devices underwent 26 explants (11% failure rate), with 58% medical failures and 42% device failures. Medical failures included infected devices and wound dehiscence, the pattern averaging 4.5 months to explantation. Hard device failures included sudden malfunction and slow decline in function, with pattern of failure over 4.2 months. Soft failures included tinnitus and discomfort, with failure over 8 months.

**Conclusion:** There were common patterns when evaluating both medical and device failures. By recognizing patterns of symptoms that may indicate probable implant failure, otolaryngologists can better counsel patients on what to expect with their implants when they present with certain symptoms.

### Otology/Neurotology

#### Systemic Erdosteine against Cisplatin-Induced Ototoxicity

**Sofia Waissbluth, MD (presenter); Isabelle Dupuis; Sam J. Daniel MD, FRCSC**

**Objective:** Cisplatin is a commonly used chemotherapeutic agent. One of its major dose limiting side effects is ototoxicity. No treatment has yet been approved for this condition. The objective of this study was to determine the potential protective effect of a systemic administration of erdosteine against cisplatin-induced ototoxicity.

**Method:** Guinea pigs were assigned to 4 groups, each receiving a different concentration of intraperitoneal erdosteine: 0, 100, 200, and 500 mg/kg/d for 4 days. All of the animals received 12 mg/kg/d of intraperitoneal cisplatin. Auditory brainstem response (ABR), scanning electron microscopy, and outer hair cell counts were performed.

**Results:** Significant otoprotection was observed in groups receiving 200 and 500 mg/kg/d of erdosteine as demonstrated by high frequency (25 kHz) ABR threshold shifts. These findings are supported by outer hair cell counts by scanning electron microscopy. Guinea pigs receiving 100 mg/kg/d did not present otoprotection.

**Conclusion:** A systemic administration of erdosteine appears to provide a significant otoprotective effect at the basal area of the cochlea for cisplatin-induced ototoxicity in a guinea pig model.