**Third Window Syndrome: Surgical Management of Cochlea-Facial Nerve Dehiscence**

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**Objective:** This communication is the first assessment of outcomes after surgical repair of cochlea-facial nerve dehiscence (CFD) in a series of patients. Pre- and postoperative quantitative measurement of validated survey instruments, symptoms, diagnostic findings and anonymous video descriptions of symptoms in a cohort of 16 patients with CFD and third window syndrome (TWS) symptoms were systematically studied.

**Study design:** Observational analytic case-control study.

**Setting:** Quaternary referral center.

**Patients:** Group 1 had 8 patients (5 children and 3 adults) with CFD and TWS who underwent surgical management using a previously described round window reinforcement technique. Group 2 had 8 patients (2 children and 6 adults) with CFD who did not have surgical intervention.

**Interventions:** The Dizziness Handicap Inventory (DHI) and Headache Impact Test (HIT-6) were administered preoperatively and postoperatively. In addition, diagnostic findings of comprehensive audiometry, cervical vestibular evoked myogenic potential (cVEMP) thresholds and electrocochleography (ECoG) were studied. Symptoms before and after surgical intervention were compared.

**Main outcome measures:** Pre- vs postoperative DHI, HIT-6 and audiometric data were compared statistically. The thresholds and amplitudes for cVEMP in symptomatic ears, ears with cochlea-facial nerve dehiscence and ears without CFD were compared statistically.

**Results:** There was a highly significant improvement in DHI and HIT-6 at pre- vs postoperative (p<0.0001 and p<0.001, respectively). The age range was 12.8 – 52.9 years at the time of surgery (mean=24.7 years). There were 6 females and 2 males. All 8 had a history of trauma before the onset of their symptoms. The mean cVEMP threshold was 75 dB nHL (SD 3.8) for the operated ear and 85.7 dB (SD 10.6) for the unoperated ear. In contrast to superior semicircular canal dehiscence, where most ears have abnormal ECoG findings suggestive of endolymphatic hydrops, only 1 of 8 operated CFD ears (1 of 16 ears) had an abnormal ECoG study.

**Conclusions:** Overall there was a marked improvement in DHI, HIT-6 and symptoms postoperatively. Statistically significant reduction in cVEMP thresholds was observed in patients with radiographic evidence of CFD. Surgical management with round window reinforcement in patients with CFD was associated with improved symptoms and outcomes measures.