Change in Self-Reported Dizziness Handicap Following Cartilage Cap Occlusion Surgery for Superior Canal Dehiscence

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Abstract

Objective: 1.) To evaluate the change in dizziness handicap following cartilage cap occlusion for surgical repair of superior semicircular canal dehiscence (SCD); and 2.) to explore possible variables that may influence dizziness handicap.

Study Design: Repeated-measures design; retrospective case history review.

Methods: The Dizziness Handicap Inventory (DHI) was sent to 35 patients treated using the cartilage cap occlusion for surgical repair of confirmed SCD between July 2009 and December 2010. Pre- and postoperative DHI scores were compared. Comparitive chart review evaluated possible characteristics that may influence self-reported dizziness handicap.

Results: Twenty patients returned the postoperative DHI. Total scores (median, inter-quartile range) did not change significantly between preoperative (48, 28 to 56) and postoperative (33, 19 to 50) scores. Total scores for SCD patients with moderate/severe dizziness handicap (> 30 DHI total score, n = 14) demonstrated a significant change (p = .001), while those with mild preoperative handicap (≤ 30 DHI total score, n = 6) did not (p = .87). All patients reported dizziness before surgery. Additional conditions, such as migraine, peripheral vestibulopathy, anxiety, and depression, were distributed similarly among those whose scores improved and those whose scores did not.

Conclusions: Dizziness handicap outcomes vary based on the level of preoperative DHI total score. Patients with moderate/severe dizziness handicap preoperatively demonstrated significant change in postoperative score. Those with mild handicap showed less improvement. Additional factors may influence preoperative reports of dizziness, but it is unclear if these factors persist postoperatively.

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Background

Superior semicircular canal dehiscence (SCD) syndrome is a collection of sound- and/or pressure-induced symptoms occurring due to the thinning or absence of the bone overlaying the superior semicircular canal. Vestibular symptoms are often reported as significantly debilitating and include dizziness, vertigo, and chronic imbalance. Surgical plugging or resurfacing of the dehiscent canal has been used successfully to alleviate these symptoms.

The self-perceived effect of surgical intervention in the patient’s daily life provides an important description of surgical success. Our previous research has described a transmastoid and tegmen mini-craniotomy approach that utilizes a cartilage cap over the dome of the dehiscent canal. This method is less invasive than the standard middle fossa technique and avoids manipulation of the membranous labyrinth. With this approach, 92% (34 of 37) of patients have reported improved or resolved dizziness postoperatively.

This study aimed to quantify the change in dizziness handicap as measured by the Dizziness Handicap Inventory (DHI) in patients treated with the cartilage cap technique for surgical repair of confirmed SCD and to explore possible variables that may have influenced dizziness handicap.

Methods

Patients (n = 35) completed routine history and physical evaluation, audiometric (air-/bone-conducted thresholds, immittance, Tullio/Hennebert), and vestibular testing (oculomotor testing, videonystagmography, cervical vestibular evoked myogenic potentials [cVEMP], rotary chair, computerized dynamic posturography). Chart review documented additional health conditions and diagnoses.

Each patient completed a written preoperative DHI. A DHI was mailed following unilateral repair using the cartilage cap occlusion technique. Twenty patients (14 female, 6 male; age: 51 years, range: 36-81; 6 bilateral SCD) returned the follow-up DHI. Items were scored as originally described;2 preoperative scores were categorized as mild (< 30 points) or moderate/severe (> 30 points).7

Continuous variables were compared using Wilcoxon paired sample or two-sample tests; categorical variables were analyzed using Fisher’s exact test (p < .05).

Results

Figure 1. Relationship between preoperative DHI total score and the change in score postoperatively. Preoperative score was significantly associated with postoperative change in score (p = .02; r = .50; Spearman’s rho). The dashed line represents the fit to linear regression (y = 0.6208x + 16.835).

Figure 2. Pre- and postoperative DHI Total Scores for Mild and Moderate/Severe groups. No difference was noted between preoperative (48, 28 to 56) and postoperative (33, 19 to 50) DHI scores for the total and Mild groups. The Moderate/Severe group demonstrated significant change in postoperative score (-17, -33 to -6.5; **p = .001, Wilcoxon paired samples test), while the Mild group did not (11, -11.5 to 26, p = .67).

Figure 3. Pre- and postoperative cVEMP amplitude for Surgical and Non-Surgical sides. Median cVEMP amplitude on the surgical side was significantly larger for patients who improved (288, 245 to 326) than for those who did not improve (90, 82 to 127); **p = .002, Wilcoxon two-sample test). Non-significant differences were noted for the non-surgical sides.

Conclusions

• Patients with moderate/severe preoperative self-reported dizziness handicap demonstrate significant change in DHI total score, while those with mild dizziness handicap do not (Figures 1, 2).

• Prediction of who will demonstrate improvement is difficult.

• cVEMP amplitude may prove to be a predictor of who will demonstrate improvement (Figure 3).

• Additional conditions and testing results do not discriminate between those who improve and those who do not.

• Bilateral cases were present in the improved (n = 2) and not improved (n = 4) groups.

• The cartilage cap technique for SCD repair produces similar improvements in dizziness handicap as reported for the standard middle fossa approach, but uses a less invasive and time-consuming technique.

References