Round Window Plugging in the Treatment of Superior Semicircular Canal Dehiscence: A Single Institution Experience
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INTRODUCTION

Objectives:
To describe the use of round window plugging for superior semicircular canal dehiscence syndrome. To review further recommendations regarding the procedure based on our experience and to compare results with recent literature on round window plugging.

Methods:
Fourteen patients underwent round window plugging for superior semicircular canal dehiscence at our institution from 2012 to 2015. One surgeon treated twelve patients and a second surgeon treated two patients. All patients underwent the same surgical procedure. Available pre- and postoperative subjective and objective data was reviewed, including dizziness handicap index score, audiograms, cervical vestibular evoked myogenic potentials, and vestibular exam testing specific for superior semicircular canal dehiscence.

Results:
Fourteen patient charts were reviewed. Eight patients (57%) were males and six patients (43%) were females. Mean age was 57 years (range 32-81). Four of 14 patients (29%) showed both subjective and objective improvement. Five of 14 (36%) showed only subjective improvement. Five of 14 (36%) did not demonstrate either subjective or objective improvement.

Conclusion:
Round window plugging has been described as a less invasive treatment for patients with superior semicircular canal dehiscence. While the procedure did benefit some of our patients, successful outcomes were not predictable. We continue to offer round window plugging as a treatment option in select patients who wish to avoid or cannot undergo superior semicircular canal resurfacing through a middle cranial fossa approach. In order to further assess the efficacy of round window plugging, we recommend standardized pre- and postoperative assessment.

METHODS AND MATERIALS

This study was approved by the Geisinger Health System’s Institutional Review Board (#2016-0253).

Inclusion criteria were 1) age greater than 18 years, 2) diagnosis of SCD, and 3) underwent RWP at Geisinger Medical Center between May 2012 and August 2015. Fourteen patients met inclusion criteria and were included in this study.

All RWP procedures were performed under general anesthesia, using the same technique, at the same institution. Tragal cartilage and perichondrium were used to plug the round window.

Subjective and objective data was collected through a retrospective chart review of pre- and postoperative visits. Data collected included 1) high-resolution CT imaging of the temporal bone, 2) surgeon, 3) age, 4) sex, 5) side treated, 6) subjective symptoms of autophony, pressure induced vertigo, and sound induced vertigo, 7) Tullo’s phenomenon testing, 8) Hennebert’s sign testing, 9) tuning fork exam, 10) cervical VEMP, 11) audiograms, and 12) dizziness handicap index (DHI) scores.

RESULTS

Fourteen patients were reviewed. Eight patients (57%) were males and six patients (43%) were females. Mean age was 57 years (range 32-81).

Patients were categorized into three categories: 1) both subjective and objective improvement, 2) only subjective improvement, and 3) no evidence of subjective or objective improvement.

Four of 14 (28%) patients were categorized as having both subjective and objective improvement. Five of 14 (36%) patients were categorized as having only subjective improvement. Five of 14 (36%) patients were categorized as having no subjective or objective improvement.

None of the patients who underwent RWP in this study had a major complication including facial nerve injury, SNHL or intracranial complication. One patient did develop a small tympanic membrane perforation after the procedure. No other minor complications occurred.

DISCUSSION

Multiple techniques have been described for the surgical treatment of SCD since its discovery in 1998. The most established interventions address the superior semicircular canal directly.

Procedures aimed at decreasing the mobility of the round window have been recently described for the treatment of SCD. These procedures are thought to offer an advantage over interventions targeting the superior semicircular canal in that they are performed through a transcanal incision and carry less potential risk for SNHL, facial nerve injury, and intracranial complications.

In our study, fourteen patients were treated at the same institution with the same surgical technique. The percentage of objective improvement in these patients was not high enough to justify offering the procedure as a first-line treatment in all patients with SCD who desired repair. We do however recommend continuing to offer this procedure to select patients who wish to avoid or cannot undergo superior semicircular canal plugging, resurfacing or capping through a transmastoid or MCF approach.

CONCLUSIONS

While RWP represents a less invasive treatment option for patients with SCD, its efficacy in improving objective outcomes measured in this study was limited. Based on our experience, we do not recommend routinely offering RWP as a first line option in patients with SCD who are seeking treatment. We do recommend continuing to offer RWP in select patients who prefer to avoid or cannot undergo superior semicircular canal capping, plugging or resurfacing through a MCF or transmastoid approach. Further study comparing the outcomes of RWP to other more established procedures for SCD using a standardized pre- and postoperative assessment are needed.

REFERENCES