

Transtemporal Sigmoid Sinus Decompression: A Novel Surgical Procedure for the Treatment of Idiopathic Pulsatile Tinnitus

Patrick W. Slater, MD; Bailey H. Duhon, BS; Neha Korla, MDS

Objective: Idiopathic pulsatile tinnitus (IPT) is associated with high patient morbidity although treatment methods remain unsatisfactory. In the present study, a novel surgical method utilizing transtemporal sigmoid sinus decompression is used in the treatment of idiopathic pulsatile tinnitus.

Study Design: Retrospective Case Study

Setting: Tertiary Private Neurotology and Skull Base Surgical Clinic

Patients: The primary author, between the years of 2005 and 2020, retrospectively reviewed the charts of 287 patients with a complaint of pulsatile tinnitus. After rigorous exclusion criteria, 25 patients were diagnosed with IPT. Those patients underwent treatment and were included in our study.

Interventions: Following failed medical therapies, the primary author performed a transtemporal sigmoid sinus decompression surgery on the patients under general anesthesia.

Main Outcome Measures: Long-term resolution of IPT was measured using the Tinnitus Handicap Inventory (THI) in addition to physician-based assessment. Outcome measurements were taken preoperatively, immediately postoperatively, three months postoperatively, and at the time of this study.

Results: Sigmoid sinus decompression using the transtemporal approach was performed on 25 patients (mean age: 51.7 years, 80.0% female). Patient demographics included a unilateral right ear IPT presentation in 64.0% of the patients. Out of the 25 patients in the study, 23 (92.0%) patients experienced complete resolution of their IPT. Statistically significant differences based on THI grading before surgery (mean THI: 4.19) were evident immediately after surgery (mean THI: 1.31; $p < 0.001$), at three months postoperatively (mean THI: 1.19; $p < 0.001$), and over a mean follow-up time of 68.7 months (range, 3-168 months)(mean THI: 1.38; $p < 0.001$). Out of the two patients considered unsuccessful, one patient (case 21) experienced a partial resolution equal to a 30% decrease in THI scoring. No major postoperative complications occurred.

Conclusion: The novel transtemporal sigmoid sinus decompression is a safe and effective surgical procedure demonstrated to significantly decrease pulsatile tinnitus and provide long-term relief in patients diagnosed with IPT.

Professional Practice Gaps & Educational Need: Treatment modalities for patients diagnosed with IPT are often ineffective. Part of the difficulty in the treatment of IPT is the lack of a differential diagnosis strategy. Medical therapies are often inadequate, and the surgical treatments to this point have primarily focused on treating anatomical anomalies found in and around the sigmoid sinus. There is little research concerning the use of sigmoid sinus decompression alone as a treatment for IPT. This study intends to bridge that gap.

Learning Objectives: To better understand the clinical presentation, exclusion criteria for diagnosis, and the surgical treatment using transtemporal sigmoid sinus decompression of patients with IPT.

Desired Result: We seek to increase clinician's ability to identify and treat patients with IPT.

Level of Evidence: Level V- Case series, studies with no controls

IRB Approval: Exempt