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Endovascular Treatment of Pulsatile Tinnitus Associated with Venous Sinus Diverticulum: A Scoping Review

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ADMINISTRATIVE INFORMATION

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Review Stage at time of this submission - Completed but not published.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 12 January 2026 and was last updated on 12 January 2026.

INTRODUCTION

Review question / Objective To systematically map the literature on endovascular treatment of pulsatile tinnitus associated with venous sinus diverticulum, characterising procedural strategies, clinical outcomes, and reportedcomplications.

Rationale Despite increasing recognition of neurovascular causes of pulsatile tinnitus, the role of endovascular intervention remains poorly defined. Existing evidence is fragmented, primarily retrospective, and variably reported, limiting the ability to assess clinical effectiveness and procedural safety. This study synthesises available data on endovascular treatment outcomes to address this gap and support evidence-based decision-making.

Condition being studied Pulsatile tinnitus is a pulse-synchronous auditory perception most often caused by identifiable cerebrovascular abnormalities, particularly venous sinus pathology. Endovascular treatment offers a targeted means of addressing these lesions, yet the supporting evidence is limited to small, heterogeneous observational studies with inconsistent outcome reporting. This study was conducted to systematically synthesise existing data on endovascular management to better define treatment effectiveness, safety, and gaps in the current evidence base.

METHODS

Participant or population The review included human participants with pulsatile tinnitus attributable to an identified cerebrovascular abnormality who underwent endovascular intervention. Studies were eligible if they reported extractable outcome data for this population, irrespective of age or sex. Participants with non-vascular or non-pulsatile tinnitus were excluded.

Intervention The review evaluates therapeutic endovascular interventions for PT due to venous sinus diverticulum, including transvenous/

endovascular embolisation and stent-based techniques. Diagnostic angiography alone is excluded.

Comparator No comparators.

Study designs to be included Case report, Case series, randomised controlled trials, and retrospective/prospective cohort study.

Eligibility criteria In addition to the Population–Concept–Context (PCC) criteria, several supplementary eligibility criteria were applied to ensure relevance and interpretability of the evidence. Eligible studies were required to be peer-reviewed publications reporting original empirical data, available in full-text form, and published in English or accompanied by an English translation. No restrictions were placed on year of publication. A broad range of study designs was eligible, including randomized controlled trials, observational studies, case series, and case reports, in keeping with scoping review methodology.

Studies were excluded if they represented non-empirical publications, including editorials, commentaries, opinion pieces, letters to the editor, clinical guidelines, or government reports. Grey literature was not included. Studies were also excluded if they focused exclusively on non-endovascular (surgical or conservative) management, addressed alternative vascular or non-vascular causes of pulsatile tinnitus (including isolated idiopathic intracranial hypertension without sinus diverticulum), were published in a non-English language without translation, or were unavailable in full text.

To maximise capture of relevant studies, manual search techniques were additionally employed, including hand-searching the reference lists of included articles and forward citation tracking.

Information sources Electronic searches were performed in MEDLINE (PubMed), EMBASE, Web of Science, and Scopus from inception until present time.

Main outcome(s) Outcomes included clinical response of pulsatile tinnitus following endovascular treatment (resolution, improvement, or persistence), procedural complications, durability of symptom relief, need for retreatment, and technical or radiological success. Outcomes were recorded at immediate, short-term (≤3 months), and longer-term (>3 months) follow-up. Effect measures were reported descriptively as proportions due to heterogeneity.

Quality assessment / Risk of bias analysis Study quality was assessed using the Newcastle–Ottawa Scale for observational studies, with an adapted Newcastle–Ottawa framework applied to case series and case reports. Two reviewers independently conducted appraisal, with disagreements resolved by consensus. Quality assessment informed interpretation but did not determine study eligibility.

Strategy of data synthesis Data were analysed descriptively and synthesised narratively. Outcomes were summarised as proportions and frequencies, with results stratified by intervention type and timing of follow-up where possible. Meta-analysis was not planned due to heterogeneity across studies.

Subgroup analysis Nil.

Sensitivity analysis Nil.

Country(ies) involved Australia.

Keywords endovascular treatment, coiling, stenting, flow diversion, sinus diverticulum.

Contributions of each author

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