

Balloon dilation for eustachian tube dysfunction: systematic review

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Abstract

Background: Eustachian tube dysfunction is a disorder for which there are limited medical and surgical treatments. Recently, eustachian tube balloon dilation has been proposed as a potential solution.

Method: A systematic literature review was performed. Abstracts were selected for relevance, and pooled data analysis and qualitative analysis was conducted.

Results: Nine prospective studies, describing 713 eustachian tube balloon dilations in 474 patients (aged 18–86 years), were identified. Follow-up duration ranged from 1.5 to 18 months. Ability to perform a Valsalva manoeuvre improved from 20 to 177 out of 245 ears following eustachian tube balloon dilation and, where data were reported in terms of patient numbers, from 15 to 189 out of 210 patients. Tympanograms were classified as type A in 7 out of 141 ears pre-operatively and in 86 out of 141 ears post-operatively.

Conclusion: Prospective case series can confirm the safety of eustachian tube balloon dilation. As a potential solution for chronic eustachian tube dysfunction, further investigations are warranted to establish a higher level of evidence of efficacy.

Key words: Auditory Tube; Balloon; Dilation; Eustachian Tube

Introduction

Eustachian tube dysfunction is a physiological disorder of the eustachian tube that results in inadequate middle-ear ventilation, causing aural fullness and tinnitus. In addition, complications such as serous otitis media, tympanic membrane retraction and cholesteatoma can occur.¹ Eustachian tube dysfunction affects around 1 per cent of adults.^{2,3}

Current treatment modalities for eustachian tube dysfunction, which include pharmacological agents, mechanical devices and nasal surgery, can be ineffective.^{1,2} Treatment may entail multiple insertions of ventilation tubes in patients with chronic eustachian tube dysfunction, leading to complications such as tympanosclerosis, chronic perforation and cholesteatoma.⁴

Recently, eustachian tube balloon dilation has been researched in prospective cohort studies and is currently used 'off-label' as a potential treatment for chronic eustachian tube dysfunction.^{5,6} It aims to improve eustachian tube compliance and middle-ear ventilation. Its proposed mechanisms include mechanical dilation of the cartilaginous eustachian tube and initiation of histopathological changes to the mucosa that can alter the inflammatory process.⁷

However, eustachian tube balloon dilation is a new procedure, and the operative technique needs to be verified for its efficacy and complications. This paper systematically reviews the available evidence on eustachian tube balloon dilation for treating chronic eustachian tube dysfunction.

Materials and methods

Criteria for study eligibility

Studies were eligible for inclusion in data analysis if they were prospective (cohort or randomised), aimed to assess the effectiveness of eustachian tube balloon dilation in adults, and included outcomes of ability to perform Valsalva or Toynbee's manoeuvre and/or tympanometry results. Retrospective studies, studies that did not include one of the two aforementioned outcomes, cadaveric studies and technical studies were excluded from data analysis but included in the discussion. Published conference abstracts and case reports were excluded from this review.

Literature search and study selection

Two authors (SH and JW) independently searched Medline, PubMed and Embase databases for relevant

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