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Double-handed endoscopic myringoplasty with a holding system in children: Preliminary observations

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ABSTRACT

Objectives: Endoscopic transcanal myringoplasty is a newly-introduced technique for reconstruction of tympanic membrane perforation that offers the advantage to obviate postauricular incision. The objective of this study was to evaluate the feasibility of a double-handed endoscope holder transcanal myringoplasty in children. This technique permits bimanual execution of the procedure and allows the surgeon to overcome the two significant issues of single-handed endoscope surgery, i.e. easy domination of a bloody field and smooth introduction of the graft.

Methods: A prospective non-randomized study of 10 consecutive primary endoscope holder-aided myringoplasties was performed; 3 mm or 4 mm 0° rigid endoscopes were used. A xenograft, biologic soft tissue, was applied in all cases.

Results: All procedures were performed successfully. Duration of surgery was faster than with a single-handed procedure and varied between 20 and 60 min. The tympanic membrane healed successfully in all patients.

Conclusions: In this preliminary experience in children, a bimanual endoscopic holder-aided myringoplasty technique offers the possibility to overcome the obstacles encountered in a single-handed technique, since it can replicate the same concept of a bimanual microscopic approach and allow for easy management of a bloody field and introduction of the graft in the middle ear.

1. Introduction

Tympanic membrane reconstruction is a common procedure in the pediatric age and frequently requires a postauricular approach [1,2]. The introduction of endoscopy allows mini-invasive procedures such as transcanal myringoplasty in all patients [3,4]. Different reports have been published describing the advantages of an endoscopic approach in ear surgery [5,6], and Khan and Parab [7] have recently published a study on cartilage tympanoplasty using an endoscope holder. Since 2010, myringoplasty is always performed using a transcanal endoscopic approach in our Department. The most limiting factor of endoscopic surgery is that one hand is always dedicated to holding the endoscope, making surgery more tedious in bloody fields. The aim of this study is to report our preliminary experience on the feasibility and advantages of a double-handed transcanal myringoplasty with the use of an endoscope holder and biologic xenograft in children.

2. Materials and methods

The design and informed consent form for the study were approved by the Institutional Review Board of the Province of Brescia.

The endoscopic procedure consisted of: 1) application of the endoscope holder on the operating table in front of or laterally to the surgeon (Fig. 1); 2) positioning of the endoscope on the posterior wall of the cartilage part of the external auditory canal; 3) refreshing the margins of the perforation using a sickle knife and grasping forceps; 4) elevating the medial tympano-meatal flap with a semilunar incision at 12 and 6 o'clock; 5) inserting the graft in an underlay fashion; 6) applying gelatin sponges in the middle ear and, after repositioning the flap, in the ear canal (Fig. 2).

For these procedures, 3 and 4 mm rigid 0° endoscopes (Hopkins KARL STORZ GmbH & Co. Tuttlingen Germany) with lengths 14 and 18 cm, respectively, were used. A HD 3 CCD camera and Xenon

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Fig. 1. Holder set-up ready for surgery.

175 W cold light source (Hopkins KARL STORZ GmbH & Co. Tuttlingen Germany) were used. The endoscope holder used was a mechanical articulating holding system (28272 H C; 28272 UGK; 28172 H R: KARL STORZ GmbH & Co. Tuttlingen Germany) (Fig. 3). All procedures were performed under general anesthesia by either the first or the third author (Table 1). A xenograft, biologic soft tissue repair graft (ENT-SRG BIODESIGN COOK MEDICAL, Bloomington, Indiana, USA) was always used.

3. Results

Transcanal endoscopic myringoplasty with holder was performed in 10 patients, 7 males and 3 females, with an age ranging from 6 years to 14 years (mean age 10 years). Duration of surgery varied between 20 and 60 min (median 35 min). All procedures were performed with no complications. Bleeding was easily managed throughout surgery thanks to the bimanual procedure. Six-month follow-up showed a healed tympanic membrane in each child with air-bone gap closure and no bone threshold impairment. A detailed description of the patient characteristics is shown in Table 1.

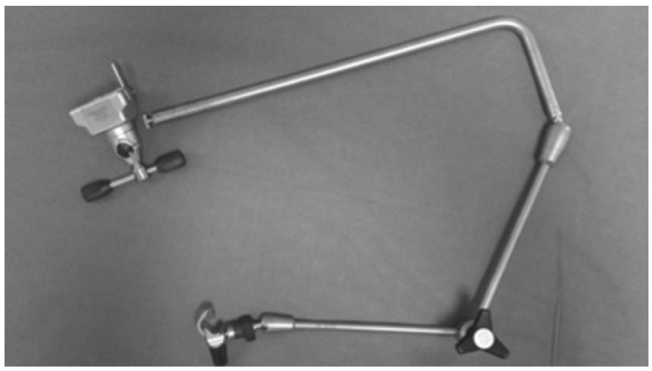

Fig. 3. Mechanical articulated holder.

4. Discussion

In recent years, some studies have been published that emphasize the advantages and feasibility of an endoscopic technique for myringoplasty [3,4,8,9]. Otosurgeons are often skeptic and hesitant in using this technique for several reasons. First, single

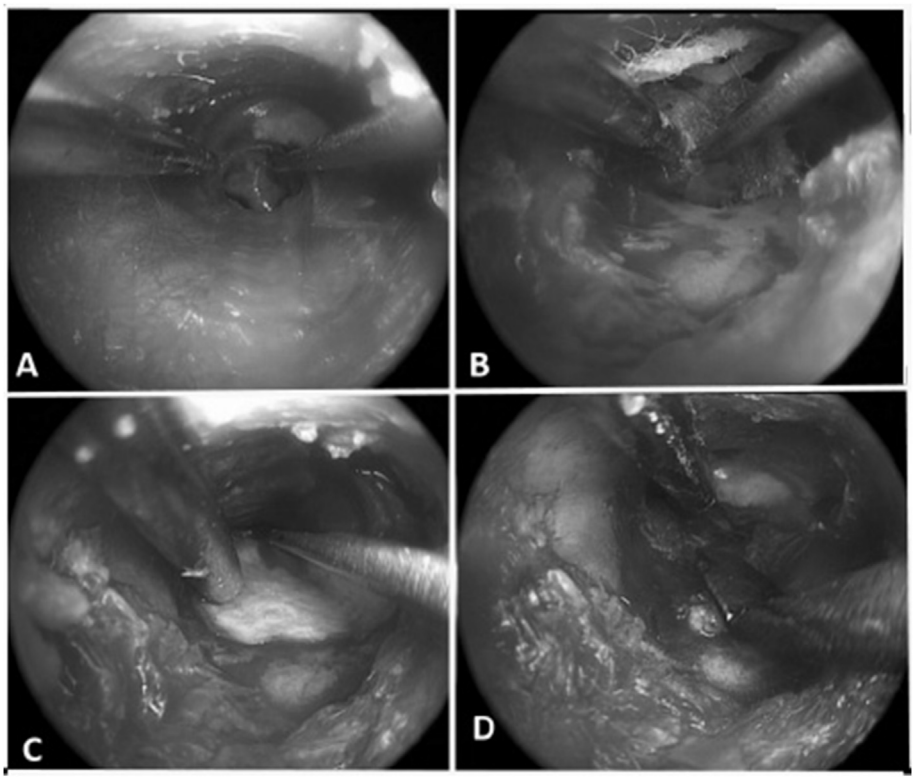

Fig. 2. Endoscopic bimanual refreshing margins of the perforation (A), elevation of the fibrous annulus (B), insertion the graft in an underlay fashion (C), repositioning of the flap (D).