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'Smart' grommets

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Abstract

Objective. A novel, smartphone-based technique for endoscopic grommet insertion is presented.

Results and conclusion. This method is both cost-effective and time-saving, offering a valuable alternative to the traditional microscope-based method in a resource-constrained setting.

Short Communication

Dr N Goncalves takes responsibility for the integrity of the content of the paper

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Introduction

Otitis media with effusion (OME) is characterised by the presence of chronic accumulated mucous in the middle ear and occasionally the mastoid cavity. This common paediatric condition is frequently secondary to acute otitis media and upper respiratory tract infections,[1] posing a significant healthcare burden. The majority of OME cases resolve spontaneously; however, the persistence of an effusion may require intervention as it can result in hearing loss.[2]

The insertion of grommets or tympanostomy tubes is one of the most frequently performed surgical procedures globally.[3] The development of an alternative, cost-effective technique for grommet insertion is necessary to aid the already burdened healthcare systems of developing countries, where OME prevalence is higher.

We present a novel endoscopic smartphone-based technique for grommet insertion. Grommet insertion performed using a smartphone has not yet been described. Endoscopic techniques have proved to be cost-effective for nasal, ear and airway surgery in most centres. The method described here is cost-effective, time-saving and easy to use for the ENT novice, making it a valuable addition to the toolkit of ENT staff working in a resource-constrained environment.

Method

The 'smart' grommet technique is performed using a Karl Storz smartphone cover, which was designed to allow a Storz endoscopic connector to be attached over the camera aperture of the applicable smartphone. In this case, an Apple iPhone® 6 was used (Figures 1 and 2); however, the cover can be easily designed to fit any specific smartphone brand of choice.

The Storz endoscopic connector (Figure 2) serves as a port to which a Hopkins® 0-degree endoscope (3 mm in diameter and 11 cm in length), with a Storz wireless light-emitting diode ('LED') light source, is attached (Figures 2 and 3). The endoscope is inserted into the ear canal, following the same approach typically employed for endoscopic ear surgery.

The fully assembled operating device is held horizontally with the non-dominant hand to allow for a landscape view of the ear canal (Figure 3). The dominant hand is simultaneously used to clear out wax with suction and perform a standard myringotomy with a myringotomy knife. The grommet is then inserted using crocodile forceps (Figure 4).

Conclusion

The insertion of grommets with a smartphone is a novel use of existing technology. It is easy to use, cost-effective and can be employed as a teaching tool. This technique may be of particular value in the developing world, where standard operating microscopes may not be available.

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Competing interests. None declared



Fig. 1. Apple iPhone 6 and customised cover (top), Storz endoscopic connector (upper middle), Hopkins 3 mm diameter, 0-degree endoscope (lower middle) and Storz light source (bottom).

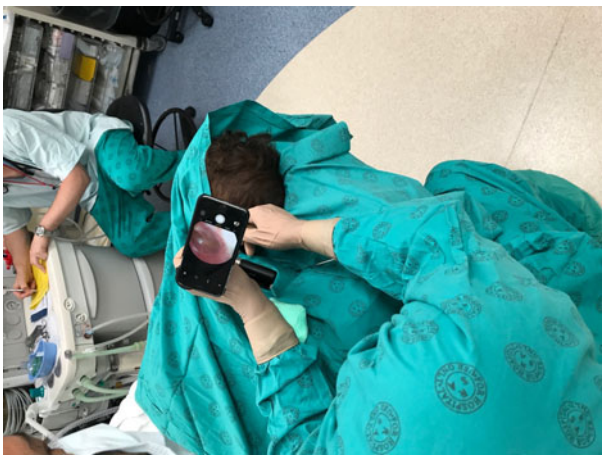


Fig. 3. Endoscopic viewing of tympanic membrane with 'smart' grommet device, with smartphone in a horizontal position towards patient's head.

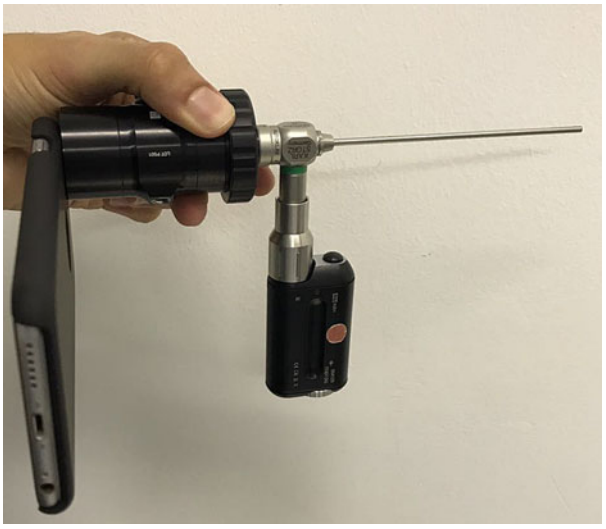


Fig. 2. 'Smart' grommet device assembled (using parts shown in Figure 1).



Fig. 4. Endoscopic views obtained using 'smart' grommet device.

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