

Research Article

Endoscopic Ear Surgery - A Single Unit Sri Lankan Experience

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Abstract

Introduction:

Endoscopic Ear Surgery was introduced in the 1980s and has gained popularity worldwide. Superior view, better access to difficult corners of the middle ear, and better ergonomics have been cited as the reasons for its success. It's a very well-established approach for managing ear cases. We are presenting our experience herewith.

Objectives:

To assess efficacy of endoscopic ear surgery in local setting

Methods

Otologic surgical patients attending Nawaloka ENT unit were selected for endoscopic approach with the sole exclusion criteria of extensive cholesteatoma. Data collected using a digital portfolio system. Patients were followed up at 1 week, 2 weeks 1 month and 2 months. Period of study was from March 2017 to December 2019.

Results

Total number of cases 92 (Myringoplasty 59, Mastoid exploration 17, Excision of Glomus Tympanicum 2, Stapedectomy 2, Excision of osteoma 2, Myringotomy and grommet insertion 10) In suppurative ear cases a success rate (as defined by dry ear without residual perforation) of 72/76 (94.7%) was achieved. Grommet insertions were done without difficulty and all cases had in situ grommets at follow up. A Stapedectomy patient had a closed air bone gap. One glomus tumour excision had a residual perforation, the other no complications.

Conclusions

Endoscopic ear surgery is an excellent method of attending to ear pathologies. With time and future developments, it might become the mainstay method of ear surgery.

Keywords: Endoscopic Ear Surgery, Myringoplasty, Stapedectomy, Glomus Tympanicum

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Introduction

Endoscopic Ear Surgery was introduced in the 1980s and has gained popularity worldwide. [1] Superior view, better access to difficult corners of the middle ear, and better ergonomics have been cited as the reasons for its success.

History

Minute nature of ear structures necessitate optical enhancement in order to perform ear surgeries safely and accurately. The first revolution of the surgery of the ear came about when the operating ear microscope was introduced in the 1950s. Hans Littmann (Zeiss company) developed this microscope, which has been used since 1953 in otologic surgery with great success. [1]

Further improvements of the Ear Microscope happened with advances in optical physics and gradually Hopkins Rod rigid endoscopy entered the middle ear surgical arena. [2]. Wullenstein (1984) has been credited for the introduction of “two endoscope” system (2.7 mm 30 degree and 70 degree) called “ototympanoscope”. This was essentially an investigative system than a treatment methodology since both hands of the operator were occupied. [2] Since then Endoscopic Ear Surgery has evolved in leaps and bounds and the indications for the approach is ever growing.

Endoscopic technique has become a very well established approach for managing ear cases and we present our experience of Endoscopic Ear surgery in various ear conditions in this paper.

Objectives

To assess efficacy and feasibility of endoscopic ear surgery in the local setting.

Methods

Patients with otological complaints with conditions necessitating ear surgery attending Nawaloka Hospitals ENT unit were selected for endoscopic approach with sole exclusion criteria of extensive cholesteatoma.

Patients were appropriately consented and data collection was carried out using a digital portfolio system. Surgeries were performed using standard Rigid Nasal Endoscope (Karl Storz) and ear micro instruments. No specialised endoscopic ear surgery instruments were used. Image acquisition and storage was carried out with a Storz Nasal Endoscopic Imaging Stack.



Figure 1: Surgical theatre setup

Surgical site preparation was done with local injection of 1:80000 adrenaline with 2 % lignocaine and 1:1000 strength adrenaline-soaked ear wicks were kept in the ear canal for about 10 minutes prior to surgery. Case appropriate surgical technique tailored to the particular patient was used to carry out the surgery. Patients were followed up at 1 week, 2 weeks 1 month and 2 months. Period of study was from March 2017 to December 2019. (33 months)

Results

Total number of cases 92 (Myringoplasty 59, Mastoid exploration 17, Excision of Glomus Tympanicum 2, Stapedectomy 2, Excision of osteoma 2, Myringotomy and grommet insertion 10) during the study period.

The male female ratio was 1.3:1 and the age range was 12 yrs. to 87yrs. In suppurative ear cases a success rate (as defined by dry ear without residual perforation) of 72/76 (94.7%) was achieved. All cases had a composite cartilage graft harvested at the time of surgery.



Figure 2 Postoperative appearance of the myringoplasty patient

Grommet insertions were done without difficulty and all cases had in situ grommets at follow up. Both Stapedectomy patient had closed air bone gap (less than 5dB). One glomus tumour excision had a residual perforation, the other no complications.

The following advantages were experienced in this technique: ^[3]^[4]

1. Wide field view
2. Quicker surgical time
3. Excellent magnification

The following were the difficulties noted and actions taken to remedy them.

1. Poor visualisation particularly during times of bleeding:

As the surgeons' non dominant hand is occupied with holding the endoscope, there is no continuous suction. This can lead to poor visualisation particularly at times of bleeding. Pre-operative preparation helps to minimise bleeding. Ear canal was infiltrated with 1: 80000 adrenaline with 2 % lignocaine and the canal was packed with 1: 1000 adrenaline soaked ear wick. Repeated washing with warm saline irrigations and cotton wool balls soaked with 1: 1000 adrenaline were used as additional methods.

2. Lack of depth perception due to fish-eye optical illusion:

Endoscopic view is known to magnify peripheral structures more than the close by ones causing an optical illusion. Small to-and-fro movements help to orientate and judge the distances more accurately.

3. Theoretical possibility of thermal damage to structures caused by heat generated by the light of the endoscope ^[5]:

Light intensity was kept at a lower setting (around 50%) and Endoscope was taken out of the ear frequently. Additionally, intermittent irrigation with saline was done. This not only reduces the heat damage but also clears the operative field of blood.

Conclusions

Endoscopic ear surgery is an excellent method of attending to ear pathologies. With a wide view of the operating field and closer inspection of middle ear structures, this approach helps the surgeon immensely in managing ear surgeries.

By transferring Functional Endoscopic Sinus Surgical (FESS) skills to the domain of the ear, an ENT Surgeon can learn and develop Endoscopic Ear Surgery practice. Although there is a learning

curve, it is not steep and time spent on acquiring these skills is well spent. Nasal Endoscopic equipment are sufficient to get the program started although there are specific instruments designed for Endoscopic Ear Surgeries. With advancing time and technological developments, Endoscopic Ear Surgery may become a mainstay method of ear surgery.

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