

# Endoscopic Ear Surgery in Dhulikhel Hospital: A decade of Experience

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## ABSTRACT

Endoscopic ear surgery is one of the most commonly performed surgeries in Dhulikhel hospital. In the past eleven years, there have been different endoscopic ear surgeries performed with a very good outcome. The main benefit of endoscopic ear surgery is; to let the surgeon see better, proceed with the surgery through the trans-canal, teaching and training of the students. There are some drawbacks of endoscopic ear surgery like the one-handed technique and learning curve. With repeated practice and the help of motion parallax, the trainee can overcome the drawback of the procedure.

## KEY WORDS

*Endoscopic ear surgery, Motion parallax, Teaching and training*

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## INTRODUCTION

In 1992, Professor Ahmed El-Guindy first described about the endoscopic ear surgery (EES).<sup>1</sup> During the late 90s in Dubai, Dr. Muaaz Tarabichi had pioneered and disseminated the use of EES. His extensive contribution in the globalization of EES recognized him as the father of endoscopic ear surgery.<sup>2</sup>

Even though there was extensive use of endoscope in the field of ear surgery during and after the late 90s, but in Nepal the microscopic approach has been a mainstay of ear surgery. However, with the development of high-definition endoscopic system and specifically designed instruments, there has been progressive use of endoscope in the field of otology in Nepal also. We, in Dhulikhel Hospital, Nepal had pioneered the use of endoscope in ear surgery starting from 2012 AD.<sup>3</sup> From thereon and thereafter, there has been many endoscopic ear surgeries being performed in our institution and other institutions of Nepal.<sup>4-6</sup>

### How we started Endoscopic ear surgery?

We had first started the endoscopic ear surgery with rigid Hopkins II (Karl Storz) 0 degree 4 mm diameter and 18 cm length endoscope with Karl Storz High definition monitor and single chip camera tower as shown in figure 1 and 2. We performed the myringoplasty as the first endoscopic ear surgery. Later on we published a paper on endoscopic ear surgeries.<sup>3</sup> During the past 11 years we have performed almost 1100 different endoscopic ear surgeries, with myringoplasty (sandwich techniques, palisade cartilage, temporalis fascia, perichondrium, cartilage shield, cartilage composite), endoscopic ossiculoplasty (total ossicular replacement prosthesis, partial ossicular replacement prosthesis, incus interposition), endoscopic stapes surgery, endoscopic atticoplasty, endoscopic trans canal steroid injection and endoscopic ventilation tube insertion. The

main hurdles of performing the endoscopic surgery is the learning curve. It usually takes time to learn this one handed technique without three dimensional vision.

**How we do it now?**

During the course of time, the technology in the medical



**Figure 1 and 2.** Showing the endoscopic tower and camera during early phase of EES.

monitor and endoscope have been improvised a lot. Now we have full high definition video monitor (Karl Storz) and high definition 3 phase charge coupled device (3-CCD) camera as shown in figure 3 and 4. It gives us the freedom in obtaining high definition videos and photos for learning and teaching purposes.

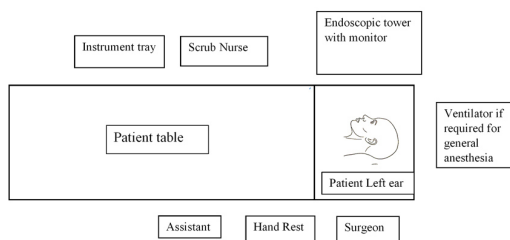
**Operation room setup for EES:**

As shown in the line diagram, for the left ear surgery the



**Figure 3 and 4.** Showing the HD monitor with 3CCD camera.

assistant should be at the same side of the surgeon, and the scrub nurse and instrument tray and the endoscopic tower should be at the opposite side of the table and the monitor should be at the level of surgeon's eye (Fig. 5).



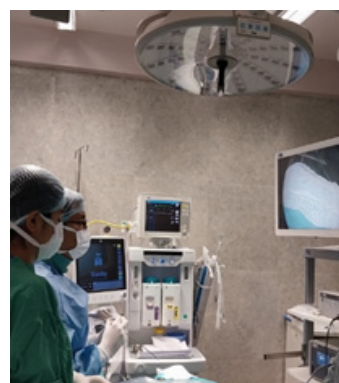
**Figure 5.** Showing the Operation room set up for EES in Dhulikhel Hospital (line diagram).

**Additional Instruments**

Though several manufacture companies provide and offer specific instruments for the EES but we think that these instruments are not necessary to start and continue the surgery. However with increasing experience in EES, one can use the angled and curved instruments like suction and dissectors.

**Position of surgeon and monitor during surgery**

The position of eye should be at the level of monitor so that the neck muscle do not go into spasm (Fig. 6). The hand should rest on a hand rest stand (Fig. 7) in such a way that forearm and elbow lies on a stand. This step is necessary to avoid fatigue and physiological tremor of the hand holding the endoscope.



**Figure 6.** Showing the position of surgeon and monitor during EES.



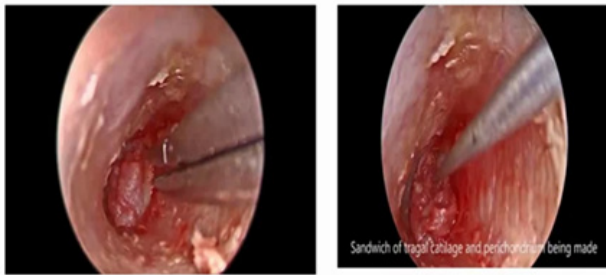
**Figure 7.** Showing the hand rest.

**Glimpses of ear surgery performed**

Since we did many cases of endoscopic ear surgeries, here are some of the glimpses of surgeries performed by the author.

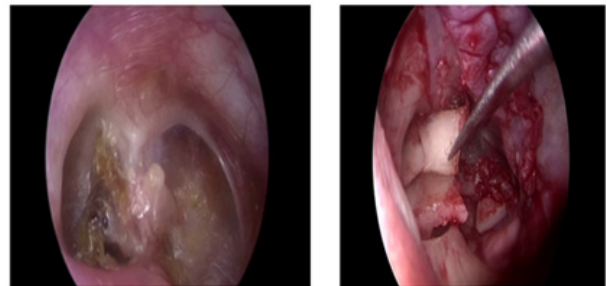
**Documentation of endoscopic ear surgery**

We document all our endoscopic ear surgery in the otologic database from ENT statistics software (Otology Module) Client Version: 4.0.0.14, Pro edition, DB version (normal model): INNOFORCE creative solutions, ENT statistics DBIII-3. 0-492 from Liechtenstein, 2019.<sup>7</sup>



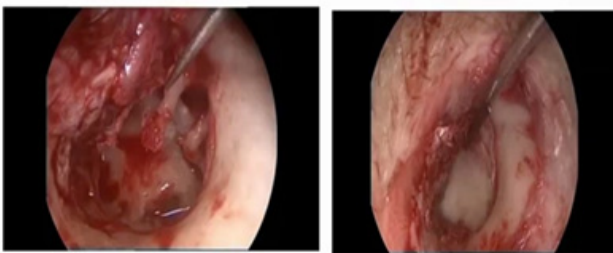
Endoscopic sandwich myringoplasty (DHOS technique)

Video URL: <https://www.youtube.com/watch?v=MKBrKtD9BRQ>



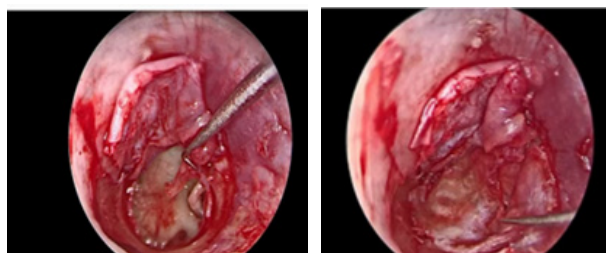
Endoscopic atticoplasty

Video URL: <https://www.youtube.com/watch?v=BUyccOO6bU0>



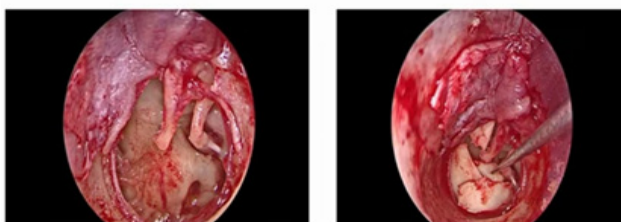
Endoscopic composite cartilage myringoplasty

Video URL: <https://www.youtube.com/watch?v=1xBsSKV7PjM>



Endoscopic temporalis fascia graft myringoplasty

Video URL: <https://www.youtube.com/watch?v=D1kSbA6Qm0U>



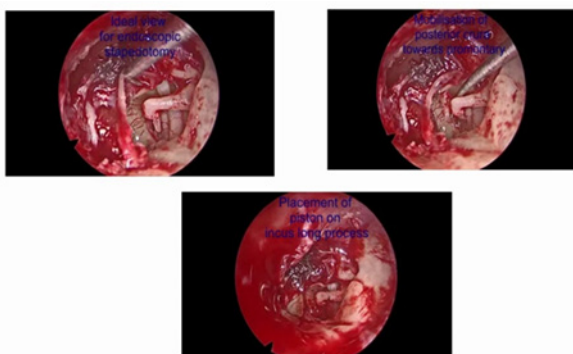
Endoscopic cartilage palisade myringoplasty

Video URL: <https://www.youtube.com/watch?v=BUyccOO6bU0>



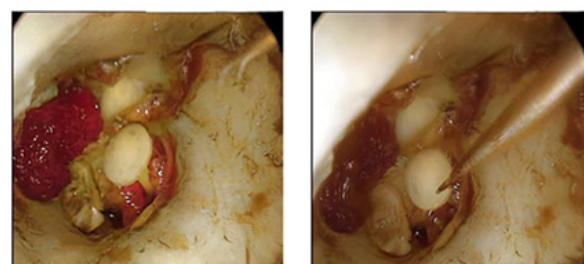
Endoscopic tympanic dexamethasone injection

Video URL: [https://www.youtube.com/watch?v=8mJ\\_RwK87fA](https://www.youtube.com/watch?v=8mJ_RwK87fA)



Endoscopic stapedotomy

Video URL: <https://www.youtube.com/watch?v=sEatvrG4aQo>



Endoscopic ossiculoplasty

### Publications in Endoscopic ear surgery till now

We had published 8 articles in endoscopic ear surgeries till now. Here are the listed published articles.

1. Shrestha BL. How I Do It? Endoscopic Modified Inlay Butterfly Cartilage Perichondrium Myringoplasty. *Kathmandu Univ Med J (KUMJ)*. 2013;11(42):185-87.

2. Shrestha BL, Dhakal A, Pradhan A, Rajbhandari P. Role of endoscopic inlay butterfly cartilage perichondrium myringoplasty in hearing outcome and graft uptake. *Kathmandu Univ Med J (KUMJ)*. 2017;59(3):197-202.

3. Shrestha BL, Dhakal A, KC AK, Shrestha KS, Pradhan A. Long term hearing results in endoscopic sandwich myringoplasty: an innovative D-HOS (DHULIKHEL HOSPITAL) technique. *Indian J Otol*. 2019; 25(3):135-40.

4. Shrestha BL, Dhakal A, Pradhan A, Pokharel M, Rajbhandari P, KC AK, Shrestha KS. Long Term Versus Short Term Hearing Results in Endoscopic Sandwich Myringoplasty. *Iran J Otorhinolaryngol*. 2021;33(5):291-9. Doi: 10.22038/ijorl.2021.54372.

5. Shrestha BL. Endoscopic stapes surgery: How I do it? *Kathmandu Univ Med J (KUMJ)*. 2021;75(3):375-7.

6. Shrestha BL. Endoscopic ear surgery in Nepal: The shift of Paradigm? *Kathmandu Univ Med J (KUMJ)*. 2021;76(4):408-9.

7. Shrestha BL. Our Experience in Database Entry in Ear Surgery. *Kathmandu Univ Med J (KUMJ)*. 2020;69(1):84-5.

8. Shrestha BL, Shakya S, Pradhan A, Dhakal A, KC AK, Shrestha KS, et al. Comparison of Hearing Result and Graft Uptake Rate between Temporalis Fascia and Tragal Cartilage in Endoscopic Myringoplasty. *Kathmandu Univ Med J (KUMJ)*. 2022;79(3):359-65.

Apart from the publications we published the surgical videos regularly in YouTube (ENT Insight Dr. Bikash Lal Shrestha) for training and teaching endoscopic ear surgery to the young ENT surgeons.

## CONCLUSION

With a decade of experience in endoscopic ear surgeries, we see many advantages while using the endoscope.

1. Endoscope provides better optics, magnification, adequate visualization, helps proper and precise evaluation of the middle ear anatomical structures. (Let the surgeon see better)
2. It decreases the unnecessary drilling of mastoid and also the unnecessary complications. (Allow surgeon to complete work through the external auditory canal)
3. The best thing is for the teaching purpose because whatever the surgeon sees on the monitor same is seen by the trainee. (Teaching and training)
4. In functional endoscopic ear surgery (FEES) we can manipulate and clear the ventilation pathway of middle ear.
5. It reduces the cholesteatoma recidivism cases.<sup>8</sup>

Like any other techniques, this endoscopic procedures has drawbacks also.

1. The three dimensional vision is lacking in endoscopic ear surgery, so it is necessary to overcome by motion parallax.
2. Learning curve is long for the endoscopic ear surgery.

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4. Shrestha BL, Dhakal A, Pradhan A, Rajbhandari P. Role of Endoscopic Modified Inlay Butterfly Cartilage Perichondrium Myringoplasty in Hearing Outcome and Graft Uptake. *Kathmandu Univ Med J (KUMJ)*. 2017 Jul-Sept.;15(59):197-202.
5. Shrestha BL, Dhakal A, Pradhan A, Pokharel M, Rajbhandari P, KC AK, et al. Long Term Versus Short Term Hearing Results in Endoscopic Sandwich Myringoplasty. *Iran J Otorhinolaryngol*. 2021;33(5):291-299. Doi: 10.22038/ijorl.2021.54372.
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