

OtoLase™

New Levels of Precision in
Middle Ear Surgery.

OtoLase Flexible CO₂ Fiber delivery system
First Ex vivo impressions.



"The CO₂ laser is an instrument of choice because of the excellent absorption of energy in water, diminishing endocochlear risks. The new interchangeable handpiece and tips have a nice ergonomical grip. All in all the new OtoLase solution is a very noteworthy improvement to middle ear laser surgery."

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Introduction

The use of the laser is well known for stapes surgery where the CO₂ laser is the instrument of choice because of the excellent absorption of energy in water, diminishing endocochlear risks. The use of the laser for cholesteatoma is less well known.

The use of KTP laser works very well in bloody surroundings however the penetration of KTP laser in bones is high. Near the fragile middle ears ossicles, the facial nerve, and the inner ear structures a CO₂ laser might be more appropriate for the job due to the high absorption in water.

Removing the matrix from the fragile and possible eroded long process of the incus and the stapes superstructure, a CO₂ laser which primarily targets the water in the cholesteatoma matrix is the logical choice. In previous work with CO₂ laser, results show a better hearing outcome in the patients that had cholesteatoma surgery with the laser versus those that had classical cold steel surgery.

Method and preparation

The OtoLase delivery system was tested on two cadaver mastoid specimen, both ears were prepared using a bien air drill. Mastoidectomy, atticotomy, and posterior tympanotomy were done and in both ears the preparation was done for a stapedotomy. In one of the ears an anterior epitympanotomy was performed to "free" the anterior and medial side of the malleus.

Outcome

With the new OtoLase solution the depth of penetration is very minimal and I felt very good control of the tissue. The energy output is well seen under the microscope by blanching and if necessary carbonization of the tissue. It's easy to use the laser beam in focus and out of focus. The visual feedback of the tissue is clear. For sanitization a series of single shots (CW, 0.05 sec 2 Watt) was used on the fragile structures. For cutting though the stapes crura and footplate, continuous mode (CW, 2 to 4 Watt) was used.

Conclusion

All in all, the new handpieces with the interchangeable tips have a nice grip and are a very noteworthy improvement. The new fiber drape is an improvement that will speed up OR preparation time.



Fig. 1 The incus as seen through a posterior tympanotomy after CO₂ laser use



Fig. 2 Super structure of the stapes as seen through posterior tympanotomy after CO₂ laser use

Risk Information

CO₂ lasers (10.6 μm wavelength) are intended solely for use by trained physicians. Incorrect treatment settings or misuse of the technology can present risk of serious injury to patient and operating personnel.

The use of Lumenis CO₂ laser is contraindicated where a clinical procedure is limited by anesthesia requirements, site access, or other general operative considerations. Risks may include excessive thermal injury and infection. Read and understand the CO₂ systems and accessories operator manuals for a complete list of intended use, contraindications and risks.

References:

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2. Lesinski SG, Lasers for otosclerosis--which one if any and why, Lasers Surg Med. 1990;10(5):448-57.
3. Motta, G. and L. Mosillo, Functional results in stapedotomy with and without CO₂ laser. ORL J Otorhinolaryngol Relat Spec, 2002. 64(5): p. 307-10.



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