A clinical system for optical coherence tomography and vibrometry

World Congress on Endoscopic Ear Surgery
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Disclosure:

Yes, within the last 12 months, I have/had a financial arrangement or affiliation with commercial interests related to the content of this continuing education activity that requires disclosure.

The authors have formed a spinout company, Audioptics Medical to commercialize the results of this research and hold equity in the company.
Middle ear optical coherence tomography

Interferometric optical imaging that produces depth-resolved images through the intact tympanic membrane

6/27/2019
Middle ear optical coherence tomography

B-mode Fly-through Volumetric

TM : Tympanic Membrane, M: Malleus, IN : Incus, IS : Incudostapedial joint, CP: Cochlear promontory

Middle ear optical coherence tomography

Middle Ear OCT

Exploratory Tympanotomy
OCT Doppler Vibrometry

Normal ear

Otoslerotic ear (hypomobile)

Ossicular discontinuity (hypermobile)

90dB SPL, 1000Hz tone stimulus
The Ossiview Middle Ear Imaging System

- Single operator
- Turnkey
- Fully integrated
- Fast workflow
The Ossiview Middle Ear Imaging System

Patient ID: 102
First Seen: 2019-May-27 01:51:11 PM
Last Seen: 2019-May-27 02:53:05 PM
Date & Time: 2019-May-27 | 14:57:53
Current Ear: Right Ear

Laser OFF
Coming features

• Real-time 3D volumetric imaging
• 2D and 3D vibrometry
• Improved image processing
• OCT Angiography
• Bone conduction
• Round window vibration
• Quantitative pneumatic otoscopy
• Spatially resolved tympanometry
Thank you!

The Ossiview Team

Engineering
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Supplementary Materials
Diagnosing otosclerosis

OCT vibrometry distinguishes normal-hearing from otosclerotic ears with 100% sensitivity and 98% specificity.

Case study: Detached malleus

Detached malleus due to trauma
Vibrometry

Above normal umbo vibration amplitude

Immobile incus
Optical Clearing Agents
OTOLOGY AND OCT

Best case scenario

OCT image of prosthetic next to OCT of tympanoplasty

Normal Ear

Cartilage tympanoplasty

EARDRUM

INCUS

STAPEDUS

MALLEUS
Clearing Cartilage

500 μm

Porcine Cartilage

15 min HA, Then 45 min PEG-PPG

500 μm