



the REGISTRY

Newsletter of the NIDCD National Temporal Bone, Hearing and Balance Pathology Resource Registry

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The REGISTRY is published semiannually by the NIDCD National Temporal Bone, Hearing and Balance Pathology Resource Registry. The Registry was established in 1992 by the National Institute on Deafness and Other Communication Disorders (NIDCD) of the National Institutes of Health to continue and expand upon the former National Temporal Bone Banks (NTBB) Program. The Registry promotes research on hearing and balance disorders and serves as a resource for the public and the scientific community about research on the pathology of the human auditory and vestibular systems.

Chronic Silent Otitis Media

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Otolaryngology is the only specialty in medicine that cannot routinely use the services of the Pathology Department of a hospital for pathologic diagnosis. Human temporal bone histopathology is more important than ever, but it requires the expertise of a human temporal bone processing laboratory; only a few such laboratories are in existence. Otopathologic studies in humans and animals have led to findings of pathology within the middle ear cleft that were hitherto unnoticed; in turn, such findings have resulted in innovative ways to diagnose and treat patients.

Chronic otitis media has been defined in textbooks as a condition associated with a perforation of the tympanic membrane with a past or present history of otorrhea. The Committee for nomenclature of otitis media has replicated this standard definition on a regular basis (1). In 1979, Paparella et al introduced the concept of ‘silent’ otitis media, to describe chronic pathological conditions that are clinically “undetected” behind an intact tympanic membrane (2). Since this chronic pathology is potentially undetected, there is usually lack of medical treatment, which increases

the risk of complications and sequelae such as endolymphatic hydrops, serous labyrinthitis and sensorineural hearing loss (3).

A classic example of chronic tissue pathology that can occur behind an intact tympanic membrane is congenital cholesteatoma. However, acquired cholesteatoma can also exist behind an intact tympanic membrane (Figure 1). Several studies have reported intractable tissue pathologies other than cholesteatoma that went undetected.

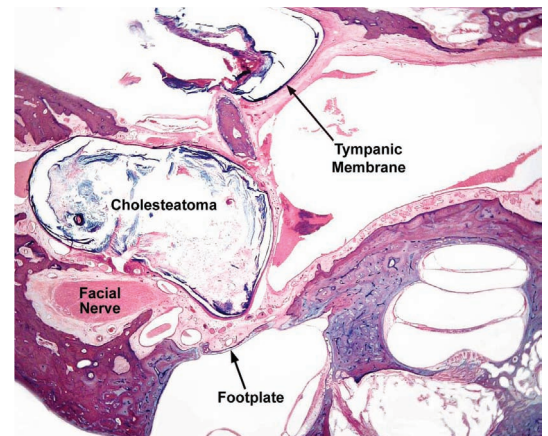


Figure 1: Human temporal bone slide showing a cholesteatoma behind an intact tympanic membrane. The cholesteatoma fills the posterior part of the tympanic cavity and extends to the stapedial footplate. Note that the facial nerve is dehiscent.

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Meyerhoff et al studied 333 temporal bones with otitis media, the most common being chronic presence of granulation tissue. They concluded that chronic otitis media occurred frequently in the absence of tympanic membrane perforation, with only 19.5% associated with a perforation (4).

Da Costa et al studied chronic otitis media with perforated (28 temporal bones) and non-perforated tympanic membranes (116 temporal bones). Histopathologic changes of the middle ear such as granulation tissue (Figure 2), ossicular changes and cholesterol granuloma were similar in temporal bones with and without perforation (5).

Jaisinghani et al studied 150 temporal bones from 97 subjects with chronic otitis media to correlate the presence of middle ear pathologies with histopathological changes of the tympanic membrane. They indicated that almost half of the temporal bones with middle ear pathology had no associated tympanic membrane pathology (6).

Mehta examined 60 temporal bones of stillborns and neonates who died of causes other than septicemia for evidence of otitis media. He found 23.3% had silent otitis media (7).

Djeric et al studied the histopathological findings of 16 temporal bones from 8 infants with otitis media who died of meningitis. Although meningitis had a rapid course ranging from 1 to 5 days, the presence of granulation tissue and infiltration of chronic inflammatory cells in the middle ear indicated that the otitis media had been present prior to the onset of meningitis. There was also chronic inflammatory cell infiltration of the round window membrane, the cochlear aqueduct and modiolus, with

accumulation of cells in the adjacent scala tympani. Since all tympanic membranes were intact and in addition, 3 were histologically normal, this silent route of infection necessitates medical attention (8).

Chronic silent otitis media with its potentially serious sequelae is undetected or undetectable by traditional otoscopy. However, multifrequency tympanometry, otoreflectance and otoacoustic emissions may allow one to detect silent chronic pathological conditions such as cholesteatoma and other middle ear pathologies behind an intact tympanic membrane (9). Plain x-rays or computed tomography are also helpful to define disease in the middle ear cleft. The history, as always, is the most important constituent for diagnosis. Although the pathology may be undetected and silent, symptoms of hearing loss, dizziness and recurrent infection may occur.

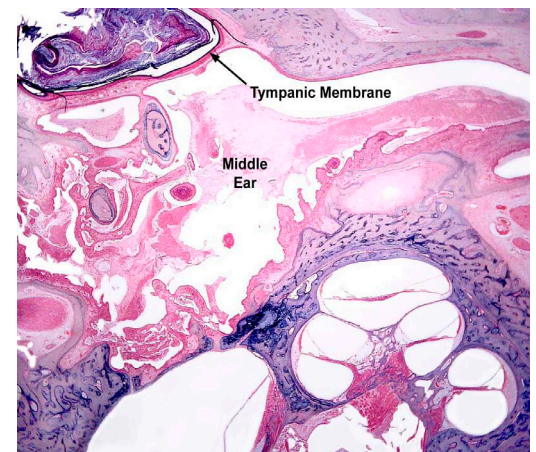


Figure 2: Human temporal bone slide showing chronic pathologic changes (mucosal hypertrophy and granulation tissue) in the middle ear behind an intact tympanic membrane.

Conclusion:

Chronic silent otitis media, characterized by intractable tissue pathology behind an intact tympanic membrane, is a common finding in human temporal bone studies. There should be a heightened awareness of this condition. Chronic silent otitis media can result in potentially serious sequelae and/or complications and can occur in both children and adults.

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OTOPATHOLOGY MINI-TRAVEL FELLOWSHIP PROGRAM

The NIDCD National Temporal Bone Registry is pleased to announce the availability of mini-travel fellowships. The fellowships provide travel funds for research technicians and young investigators to visit a temporal bone laboratory for a brief educational visit, lasting approximately one week. *The emphasis is on the training of research assistants, technicians and junior faculty.* The fellowships are available to:

- 1) U.S. hospital departments who aspire to start a new temporal bone laboratory
- 2) Inactive U.S. temporal bone laboratories that wish to reactivate their collections or
- 3) Active U.S. temporal bone laboratories that wish to learn new research techniques

Up to two fellowship awards will be made each year (\$1,000 per fellowship). The funds may be used to defray travel and lodging expenses. Applications will be decided on merit. Interested applicants should submit the following:

- 1) A 1-2 page outline of the educational or training aspect of the proposed fellowship
- 2) Applicant's curriculum vitae
- 3) Letter of support from temporal bone laboratory director or department chairman
- 4) Letter from the host temporal bone laboratory, indicating willingness to receive the traveling fellow

Applications should be sent to:

Saumil N. Merchant, M.D.
NIDCD National Temporal Bone Registry
Massachusetts Eye and Ear Infirmary
243 Charles Street
Boston, MA 02114

MEETINGS

The Registry is planning to exhibit at:



LAB SPOTLIGHT

OTOPATHOLOGY LABORATORY AT THE UNIVERSITY OF MINNESOTA

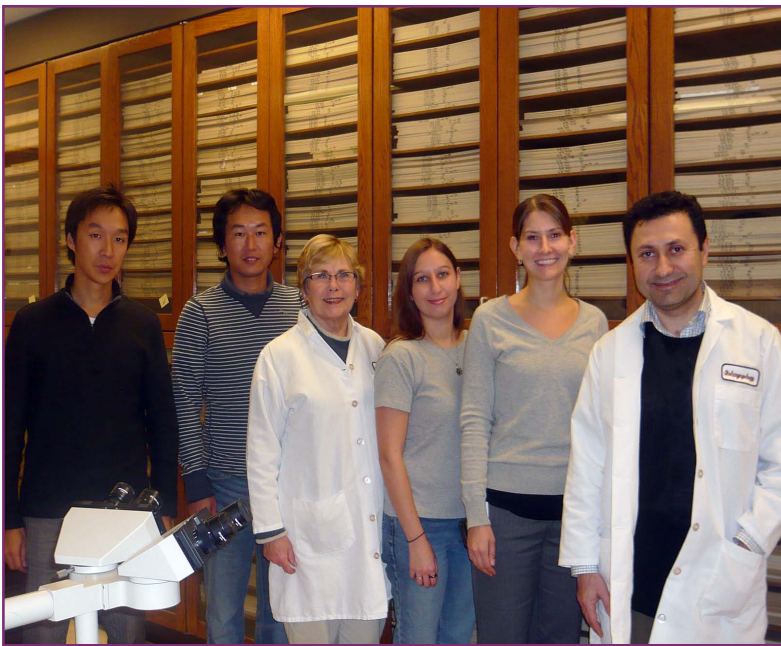
MICHAEL M. PAPARELLA, M.D. & SEBAHATTIN CUREOGLU, M.D.



The Temporal Bone Laboratory at the University of Minnesota was established in 1967 by Dr. Michael M. Paparella. The laboratory has collected, processed and studied more than 2,000 normal and pathologic human temporal bones, making this collection one of the largest of its kind in the world. The Laboratory utilizes a variety of techniques to study temporal bones including standard light microscopy, electron microscopy, histochemistry, immunostaining and *in-situ* hybridization. The collection also contains temporal bones from a variety of animal species including mouse, guinea pig, chinchilla, rat, dolphin, owl, sheep and dog.

Since it was established in 1967, over 250 physicians and scientists from all over the world have been trained in the Laboratory. This includes 26 Professors and department Chairs and an additional 50 full time faculty members in universities throughout the United States and the world. Research conducted in the laboratory has resulted in over 1,000 publications in peer-reviewed journals, covering the entire spectrum of hearing research.

Dr. Michael M. Paparella



The laboratory continues to be under the direction of Dr. Michael M. Paparella. Dr. Sebahattin Cureoglu and Dr. Vladimir Tsuprun are senior scientists.

Carolyn Sutherland is the manager of the laboratory. Other senior scientists who are affiliated with the Laboratory include Dr. Steven Juhn, Dr. Peter Santi and Dr. Jizhen Lin. At any given time, the Laboratory also has several post-doctoral fellows engaged in a variety of projects. Some of the ongoing research projects include “3D reconstructions of inner ear structures in Meniere’s disease”; “Round window otosclerosis”; “Use of optical coherence microscopy in human temporal bones”; and “DNA methylation in human chronic otitis media”.

Lab personnel, from left to right: Shigetaka Shimizu (Research Fellow), Shigetoshi Toda (Research Fellow), Carolyn Sutherland, Monica Schachern, Sandra Koterski (Clinical Fellow), and Dr. Sebahattin Cureoglu

NEWS AND ANNOUNCEMENTS

The Temporal Bone Registry has a new updated website
The address is the same

www.tbregistry.org

Please visit and enjoy the updated features

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NIDCD National Temporal Bone, Hearing & Balance Pathology Resource Registry

Give The Gift Of Hearing And Balance

Help find new cures for ear problems by donating your temporal bones to scientific research.



About the Registry

The NIDCD National Temporal Bone, Hearing and Balance Pathology Resource Registry (The Registry) is a non-profit organization that promotes research on hearing and balance disorders. The Registry serves as a resource for the public and the scientific community about research on the pathology of the human auditory and vestibular systems.

[Learn more>>](#)



Information for the Public

Millions of people have a hearing or balance disorder. The Registry is a non-profit research organization seeking new knowledge to help such individuals. You can help to find new treatments and cures for ear problems by donating your ears (temporal bones) to scientific research.

[Learn more>>](#)



Information for Professionals

Human temporal bones are an invaluable resource for learning about the pathology and pathophysiology of otologic disorders. The Registry has developed informational resources for otolaryngologists, audiologists, hearing aid dealers and other healthcare providers concerning otopathology research.

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FREE BROCHURES FOR YOUR OFFICE OR CLINIC ABOUT TEMPORAL BONE RESEARCH AND DONATION

That Others May Hear is a short brochure that briefly describes the functions of the Registry, and answers commonly asked questions regarding the temporal bone donation process.
(Dimensions: 9" x 4")

The Gift of Hearing and Balance: Learning about Temporal Bone Donation is a 16-page, full-color booklet which describes in more detail the benefits of temporal bone research. It also answers commonly asked questions regarding the temporal bone donation process.
(Dimensions: 7" x 10")

If you are willing to display either or both of these brochures, please complete the form below and return it to the Registry by mail or fax. The brochures will be sent to you **free of charge**. Please circle the amount requested for each brochure or write in amount not listed.

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