

THE PATHOPHYSIOLOGICAL BASIS OF HYDROPS

■ Pr. B. FRAYSSE



June 2026

PURPOSE OF THIS PRESENTATION

- ① What is endolymphatic hydrops ?
- ② How does endolymphatic hydrops occur ?
- ③ Why does endolymphatic hydrops cause symptoms ?

Prosper MÉNIÈRE (1799-1862)



Ménier, P. m. P.

- Born in Angers
- Director of the Institute for the Deaf and Dumb. 1938 (Paris)
- Presentation to the Academy of Medicine (1861)

Georges PORTMANN (1890-1985)



Musée Aquarium d'Arcachon

C R Soc Biol 1921; 85: 1070-2

Research on the physiology of the endolymphatic
sac and cells in celacians

PORTMANN G.



HALLPIKE C. & CAIRNS H.

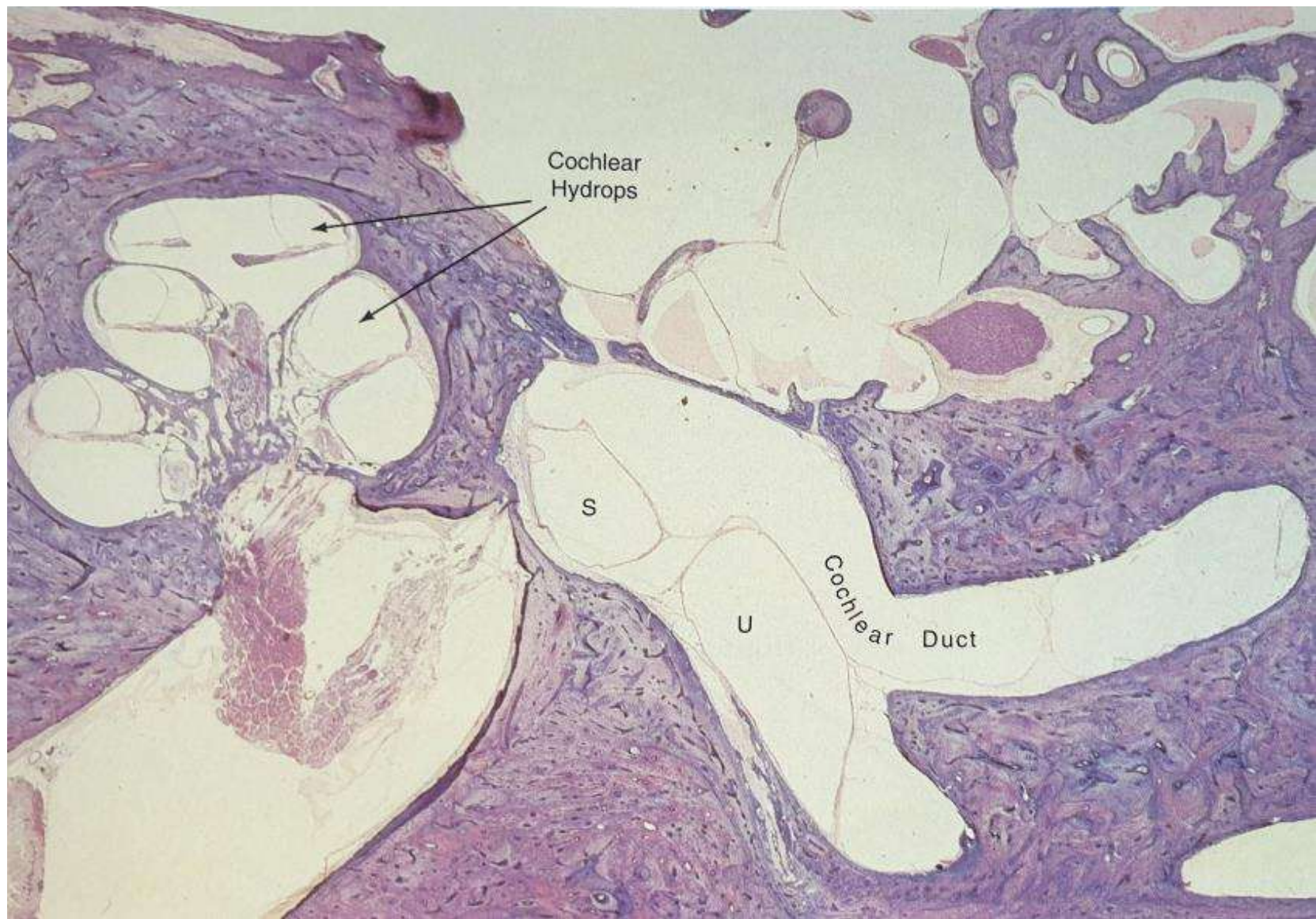
J Laryngol Otol 1938; 53 : 625-54

Observations on the pathology of
Meniere's disease

HALLPIKE C., CAIRNS H.

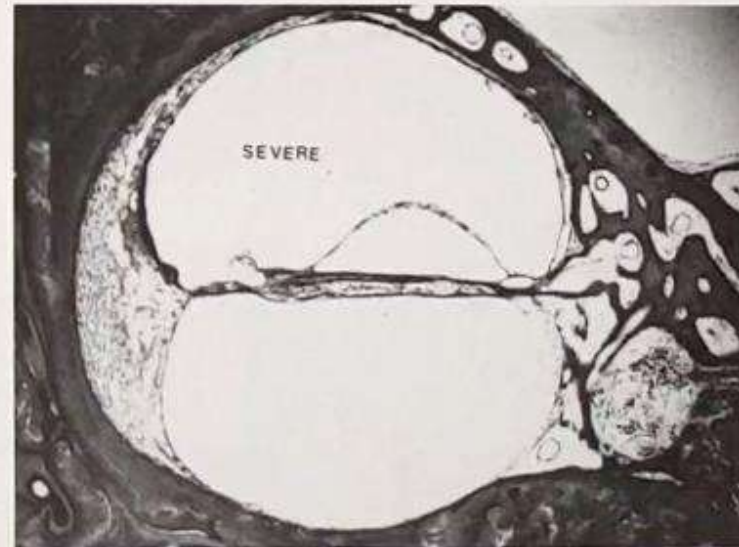
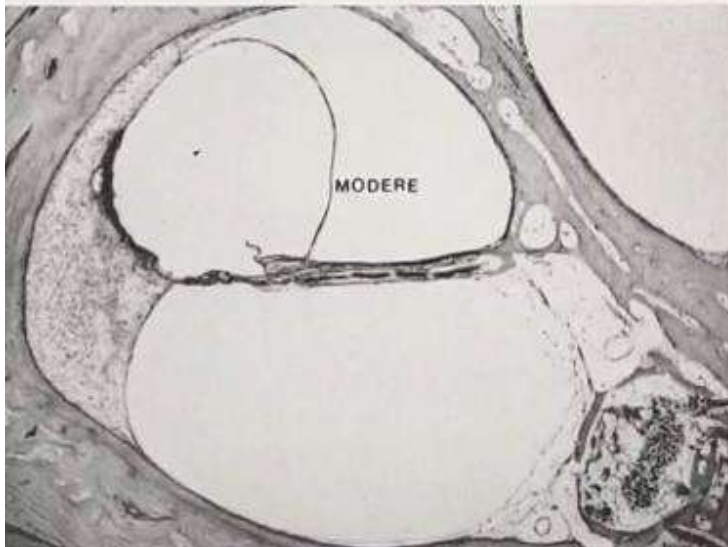
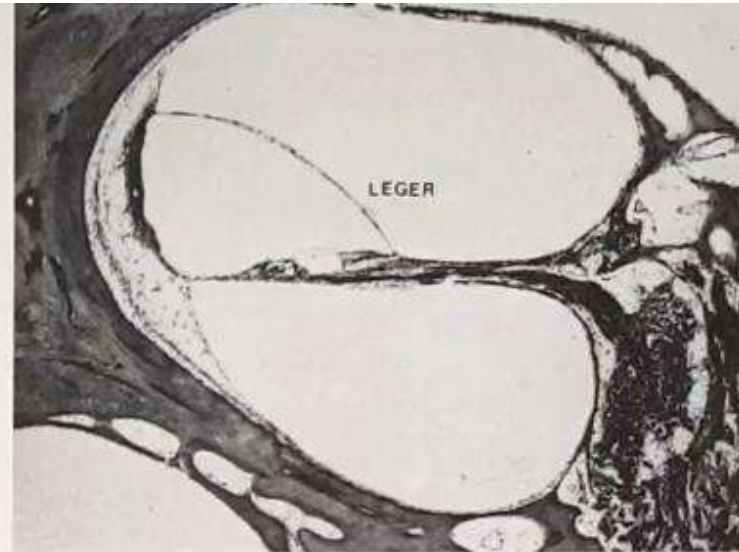
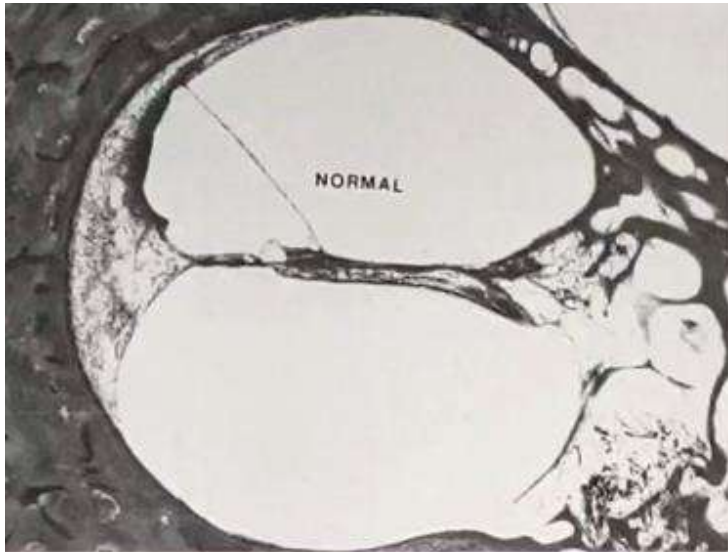


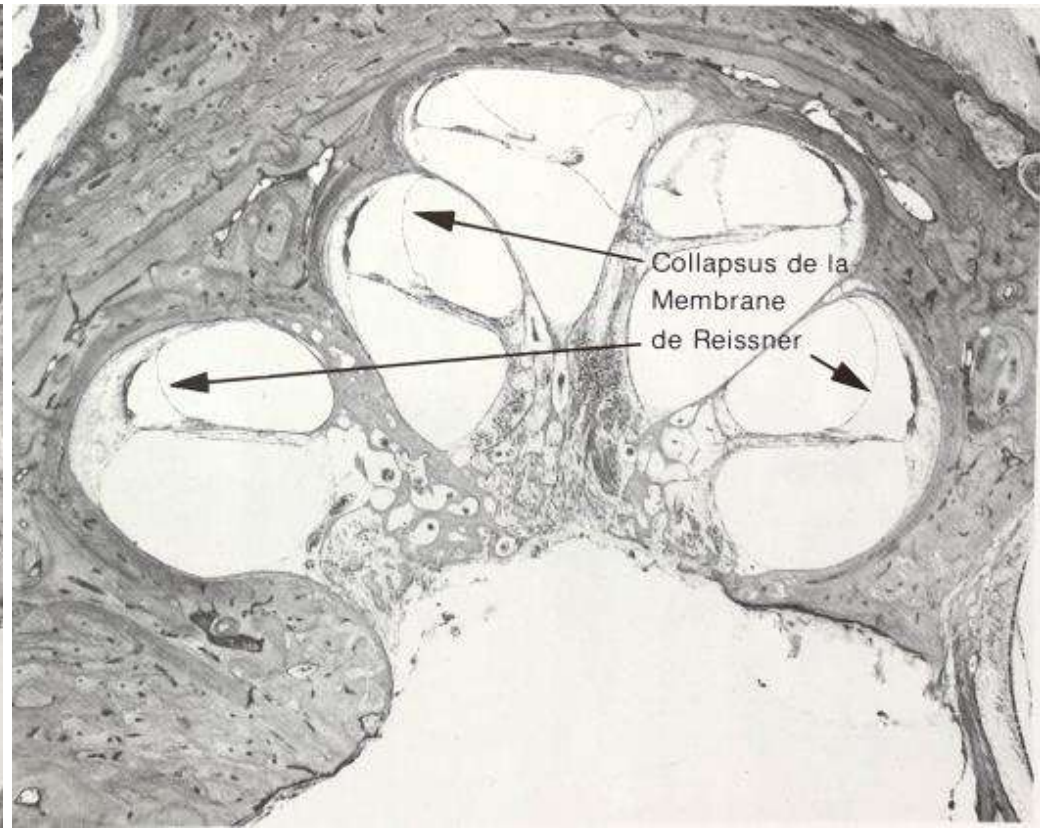
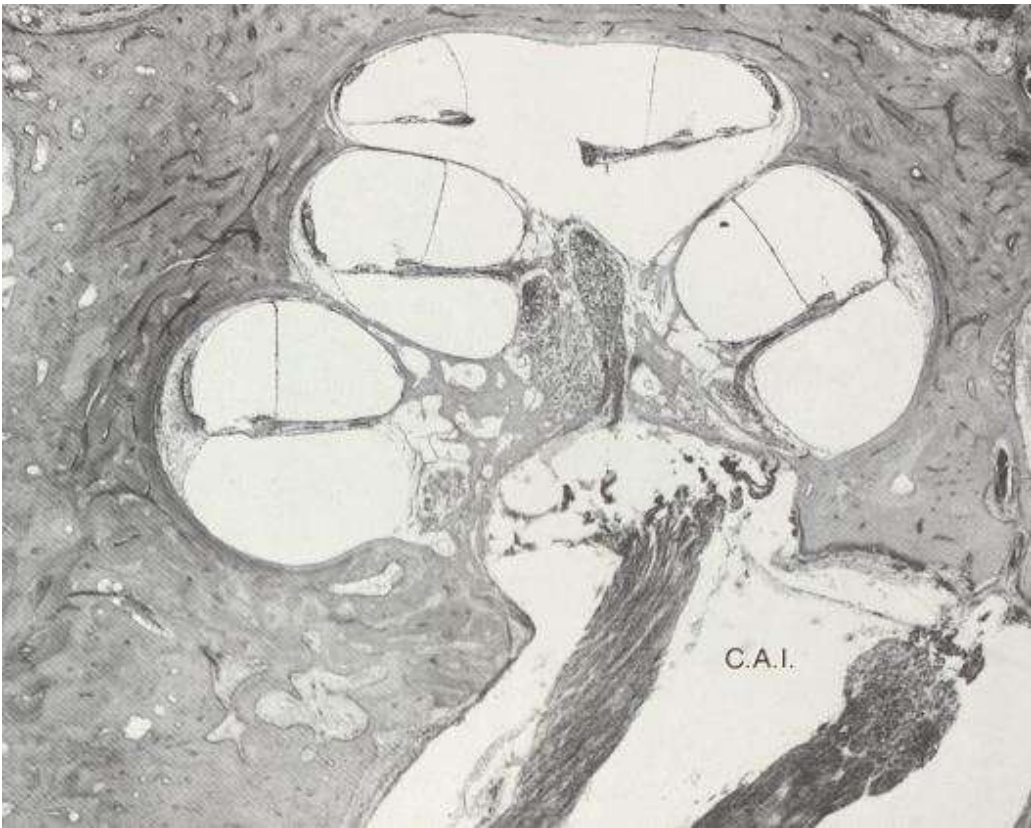
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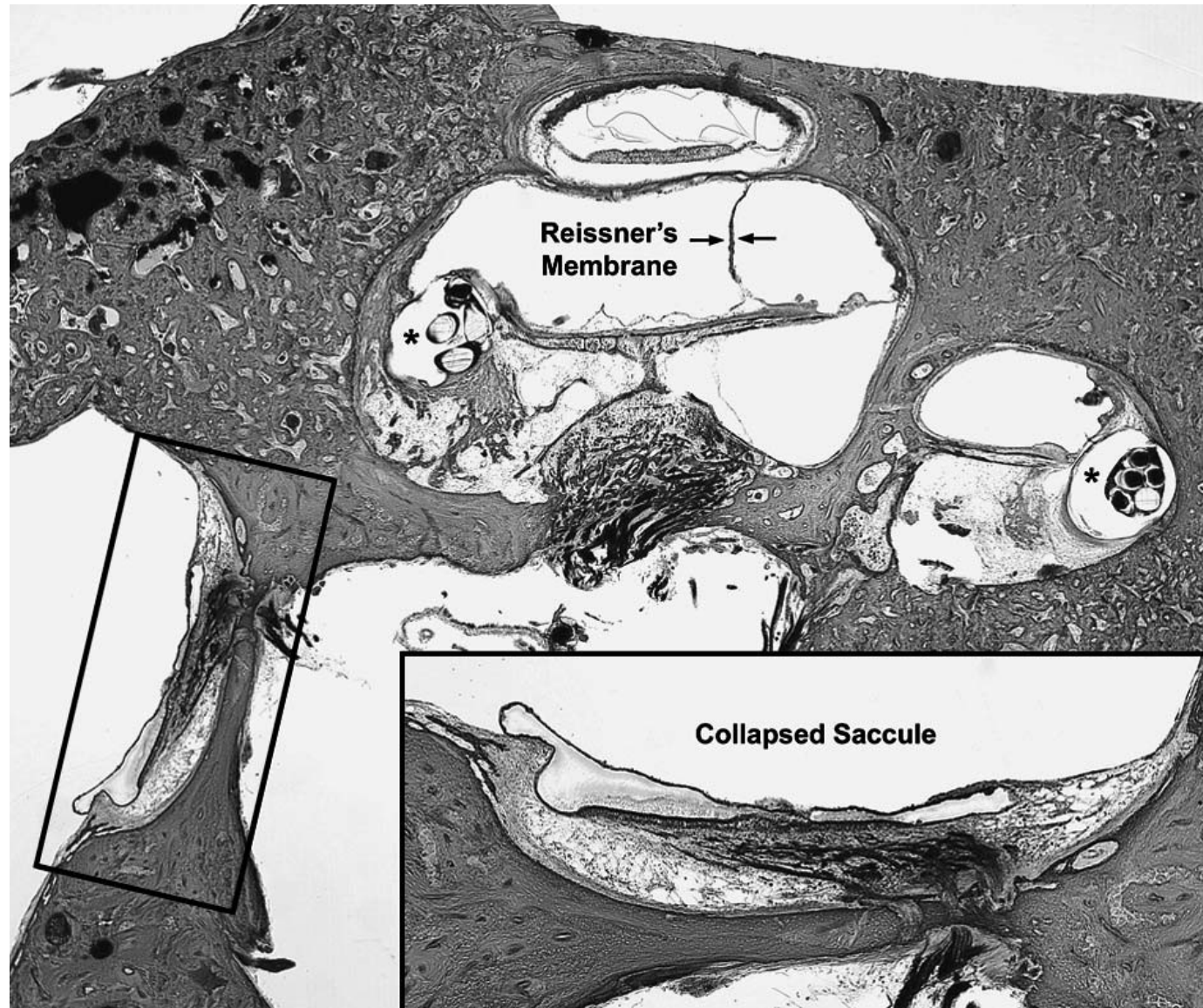


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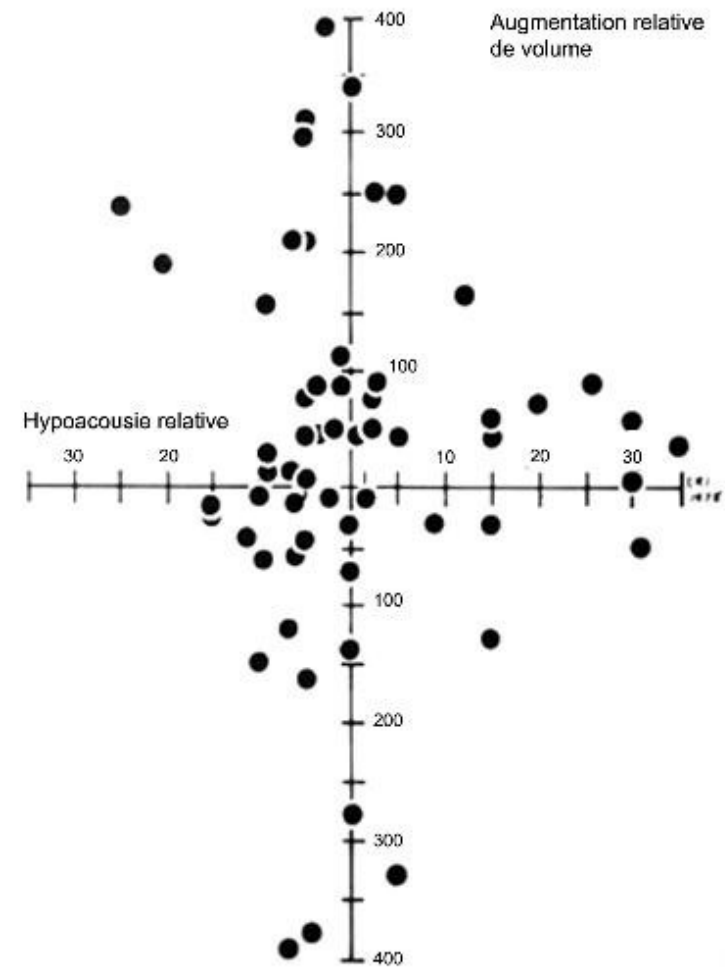
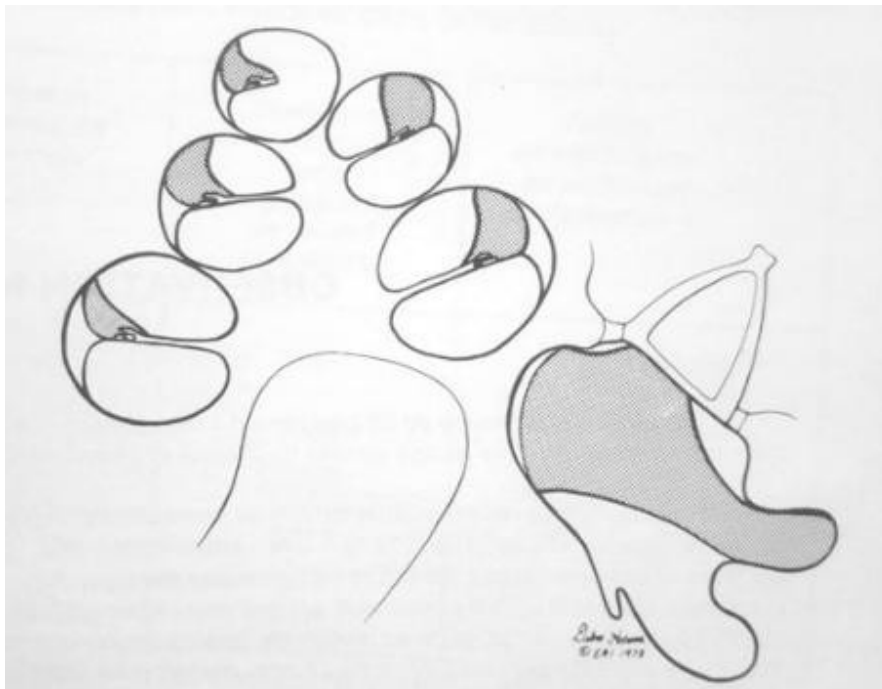
- ① What is endolymphatic hydrops ?
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CORRELATION BETWEEN AUDIOGRAM AND COCHLEAR CANAL DILATATION

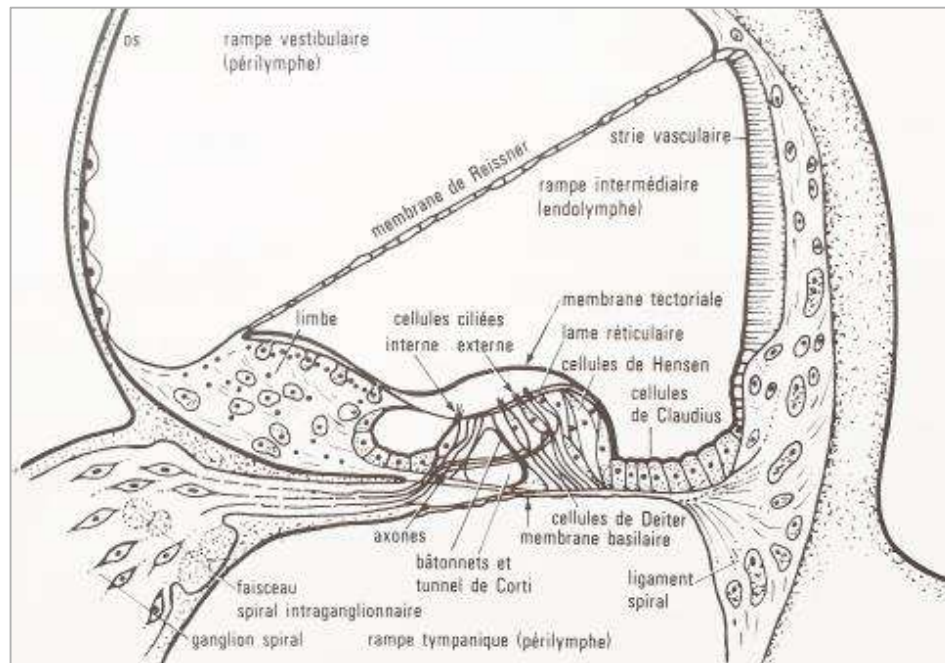


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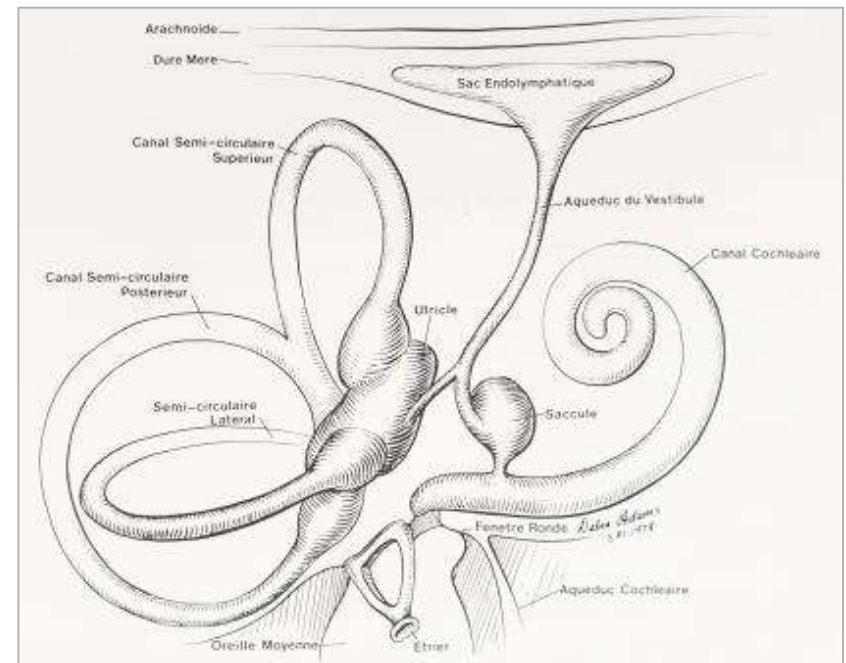
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Secretion and reabsorption of endolymph

Radial theory

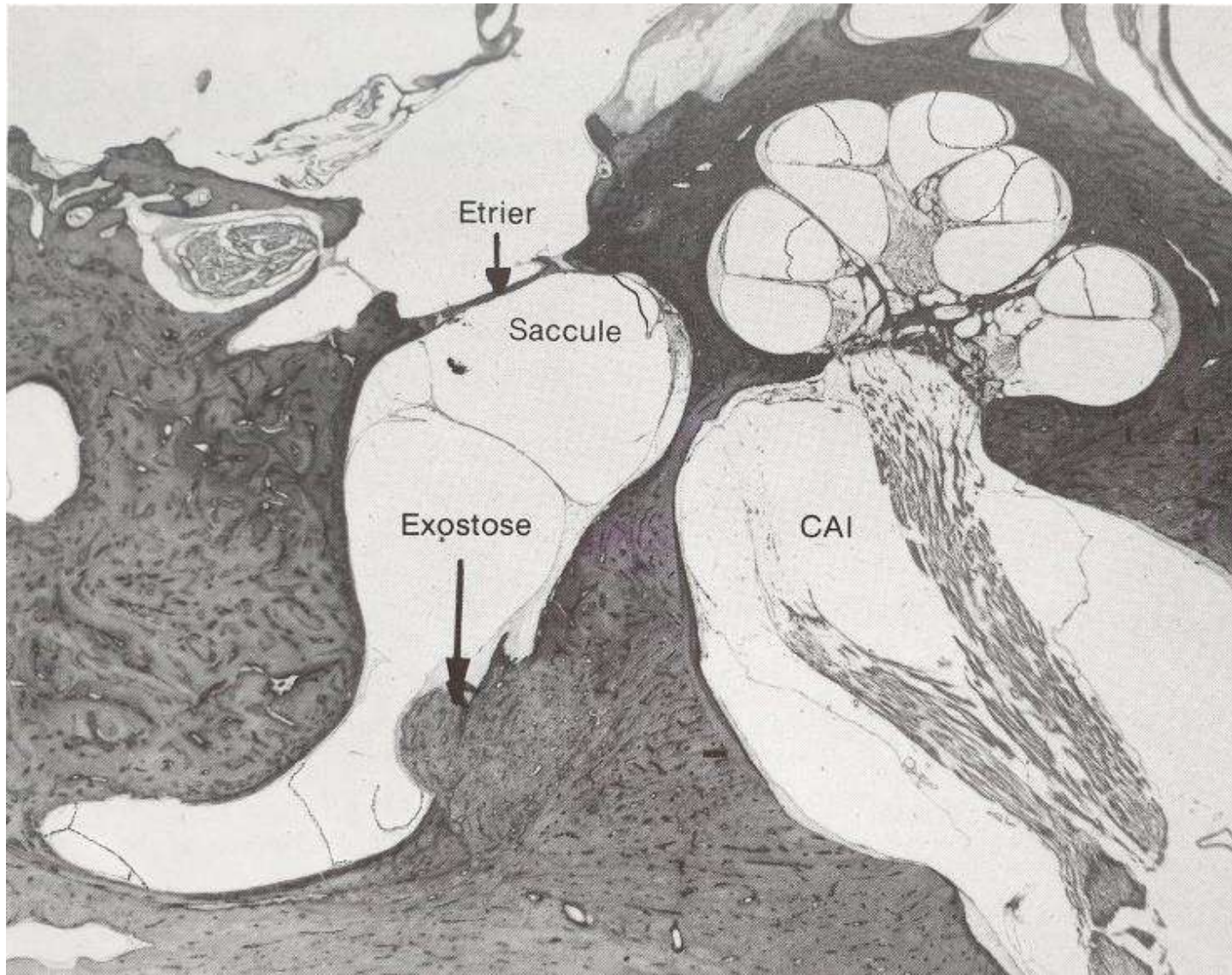


Longitudinal theory



MECHANISMS UNDERLYING THE DEVELOPMENT OF HYDROPS

- ① Obstruction of longitudinal flow at the aqueduct
- ② Changes of osmotic gradients
- ③ Excessive secretion
- ④ Dysfunction of the endolymphatic sac :
 - Impaired resorption
 - Excess glycoprotein secretion with flow from the sac to the inner ear
- ⑤ Autoimmune cause



MÉCANISME DE PRODUCTION DE L'HYDROPS

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Pathogenesis of Meniere's disease: Endolymph ion regulation

Evelyne Ferrary¹, Olivier Sterkers^{1,2} and Patrice Tran Ba Huy³

¹INSERM U.426 and ²Service ORL Hôpital Beaujon, Faculté Xavier Bichat; ³Service ORL Hôpital Lariboisière, Laboratoire d'Otologie Expérimentale, Faculté Lariboisière Saint-Louis; Université Paris, Paris, France

- There is an osmotic gradient between :
 - ① The apex and the base of the cochlea
 - ② The endolymph and the perilymp

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EXCESSIVE SECRETION

- Example « biphasic » model (*Dennebier, 1997*) in guinea pigs
 - Stimulation of endolymph secretion by administration of aldosterone in guinea pigs increases the percentage of endolymphatic hydrops induced by minimal traumatic injury to the sac

MÉCANISME DE PRODUCTION DE L'HYDROPS

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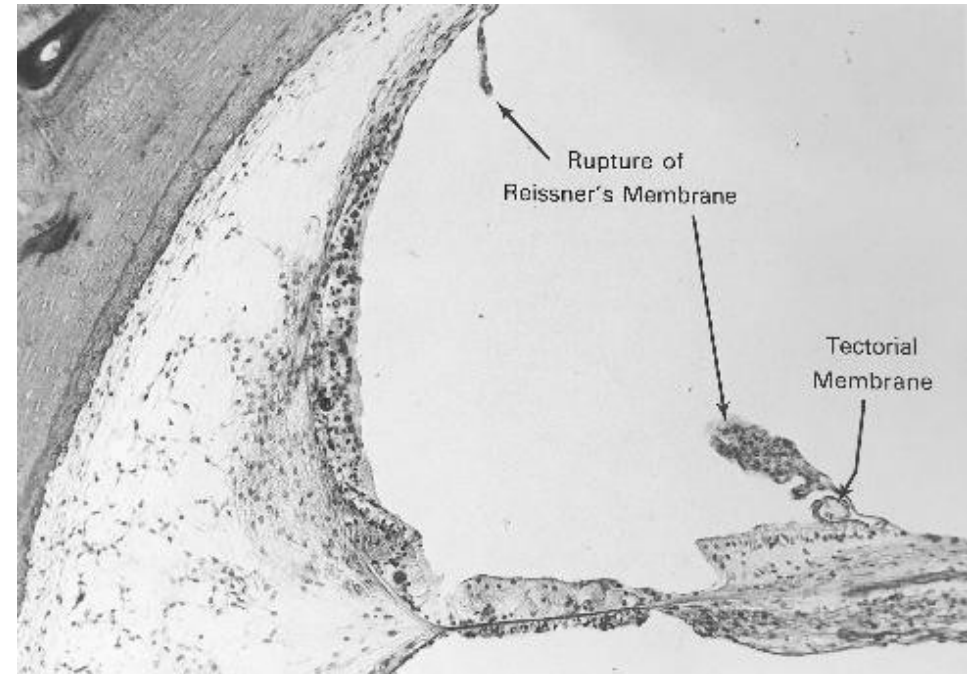
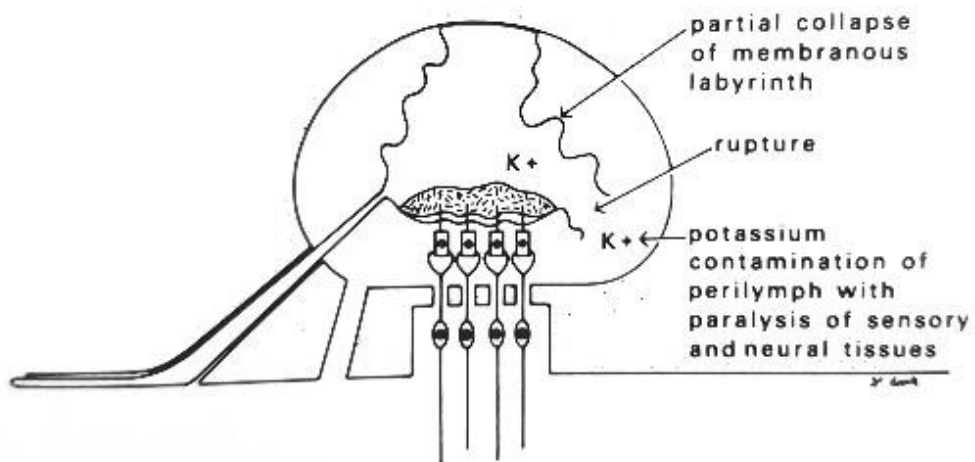
THE RELATIONSHIP BETWEEN HYDROPS AND CLINICAL PRACTICE

- Biochemical « rupture » theory
- Mechanical « distorsion » theory

BIOCHEMICAL THEORY

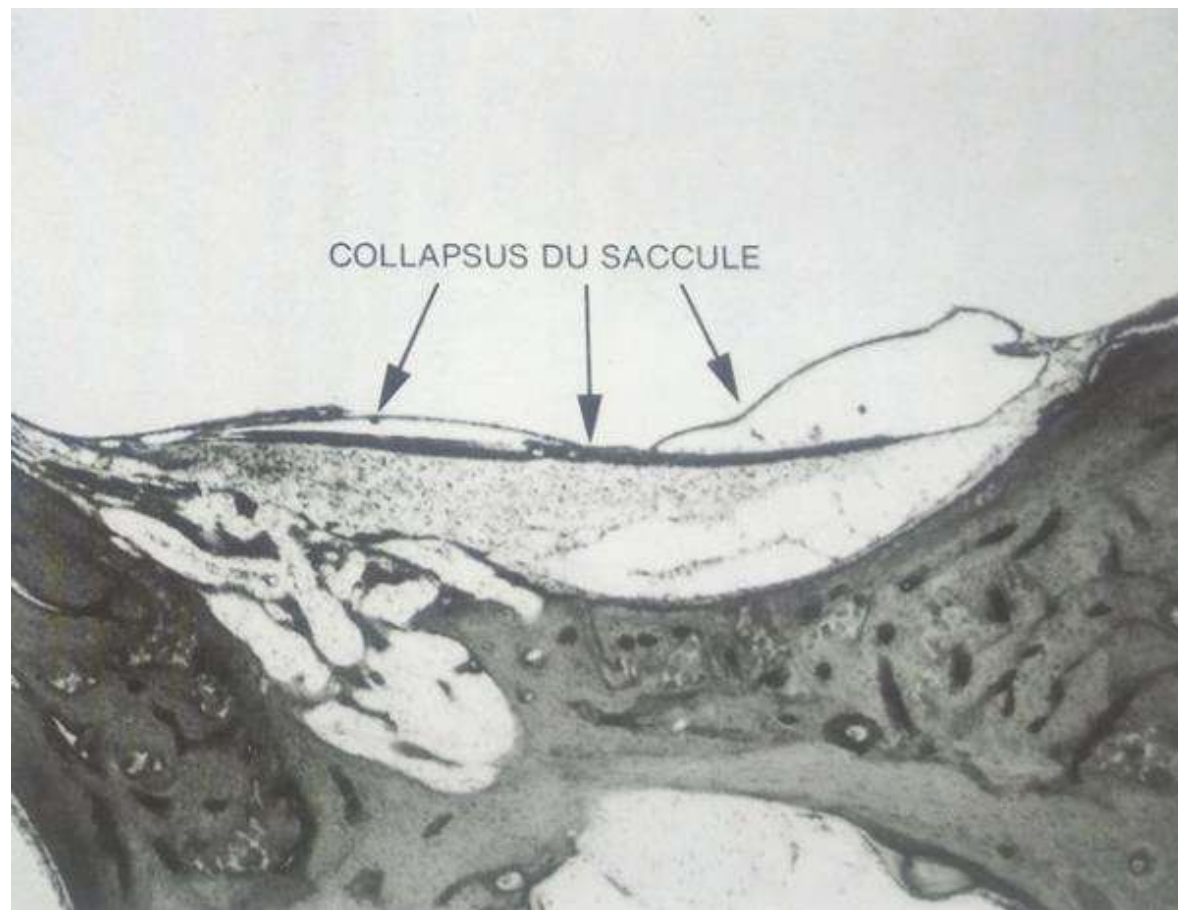
« Rupture »

RUPTURE OF MEMBRANOUS LABYRINTH



MECHANICAL THEORY

« Distorsion »

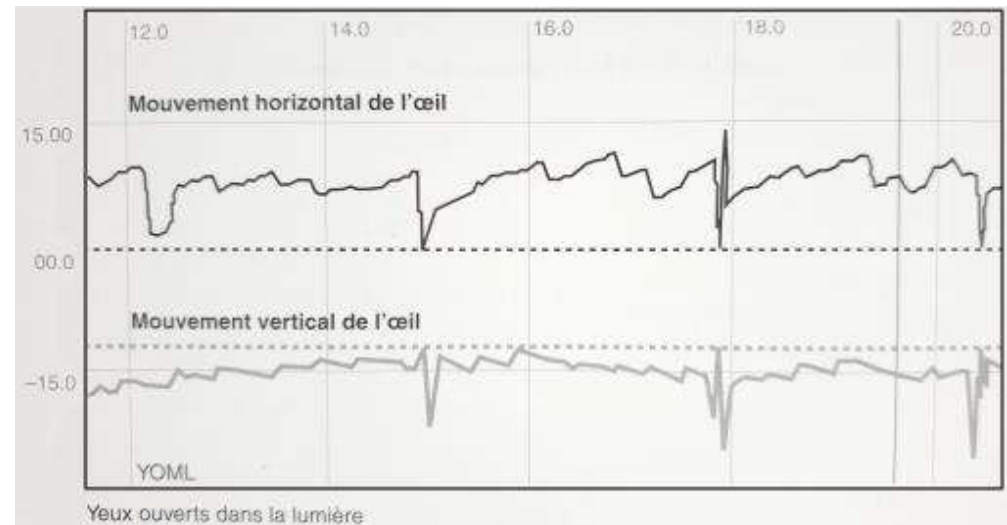
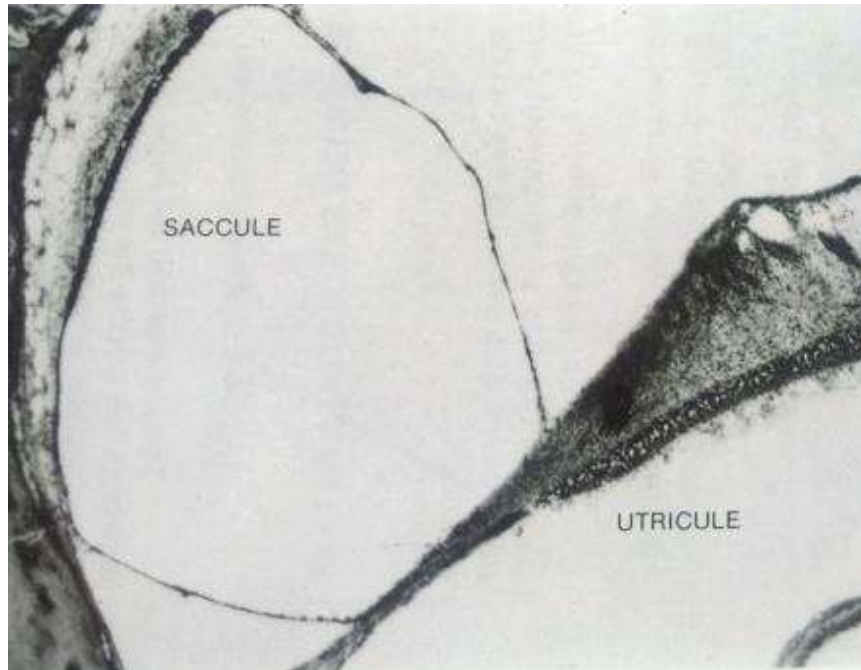




WEBINAR

June 2026

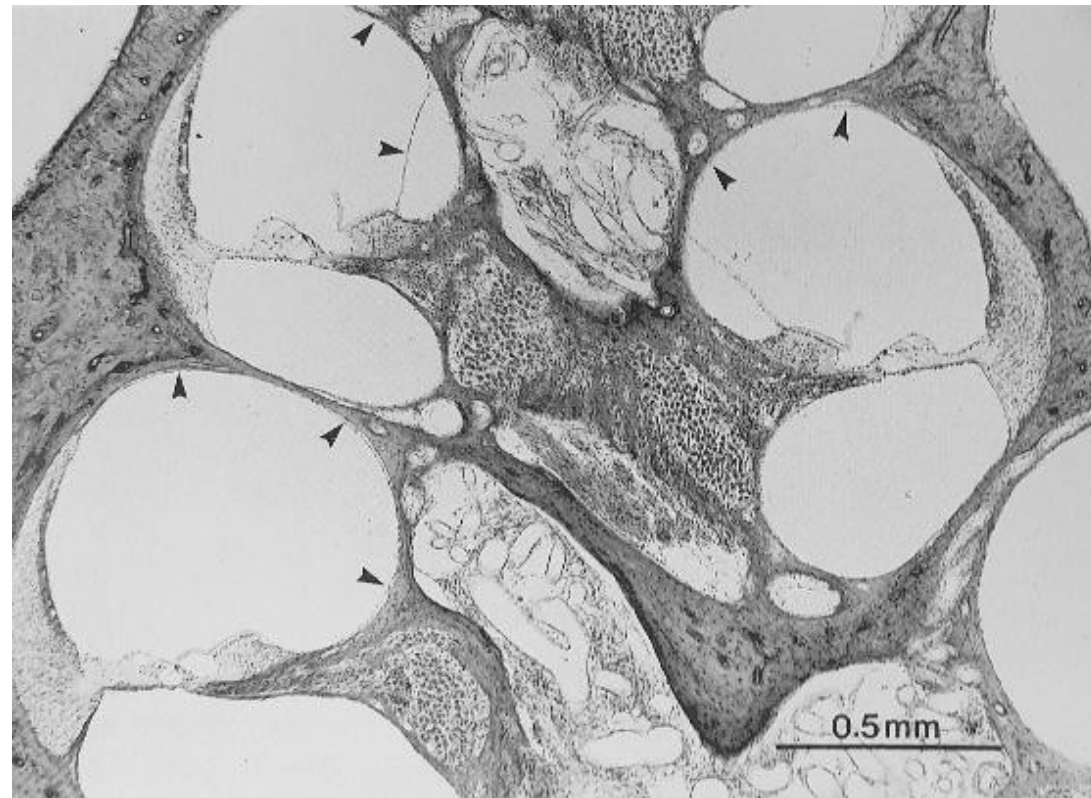
CORRELATION BETWEEN SACCULE DILATATION



Experimental hydrops

Robert S. Kimura

Department of Otolology and Laryngology, Harvard Medical School, and the Department of Otolaryngology, Massachusetts Eye and Ear Infirmary, Boston, MA, USA



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