ELECTRONYSTAGMOGRAPHY FISTULA TEST IN SENSORINEURAL HEARING LOSS

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IN AUDIOLOGY

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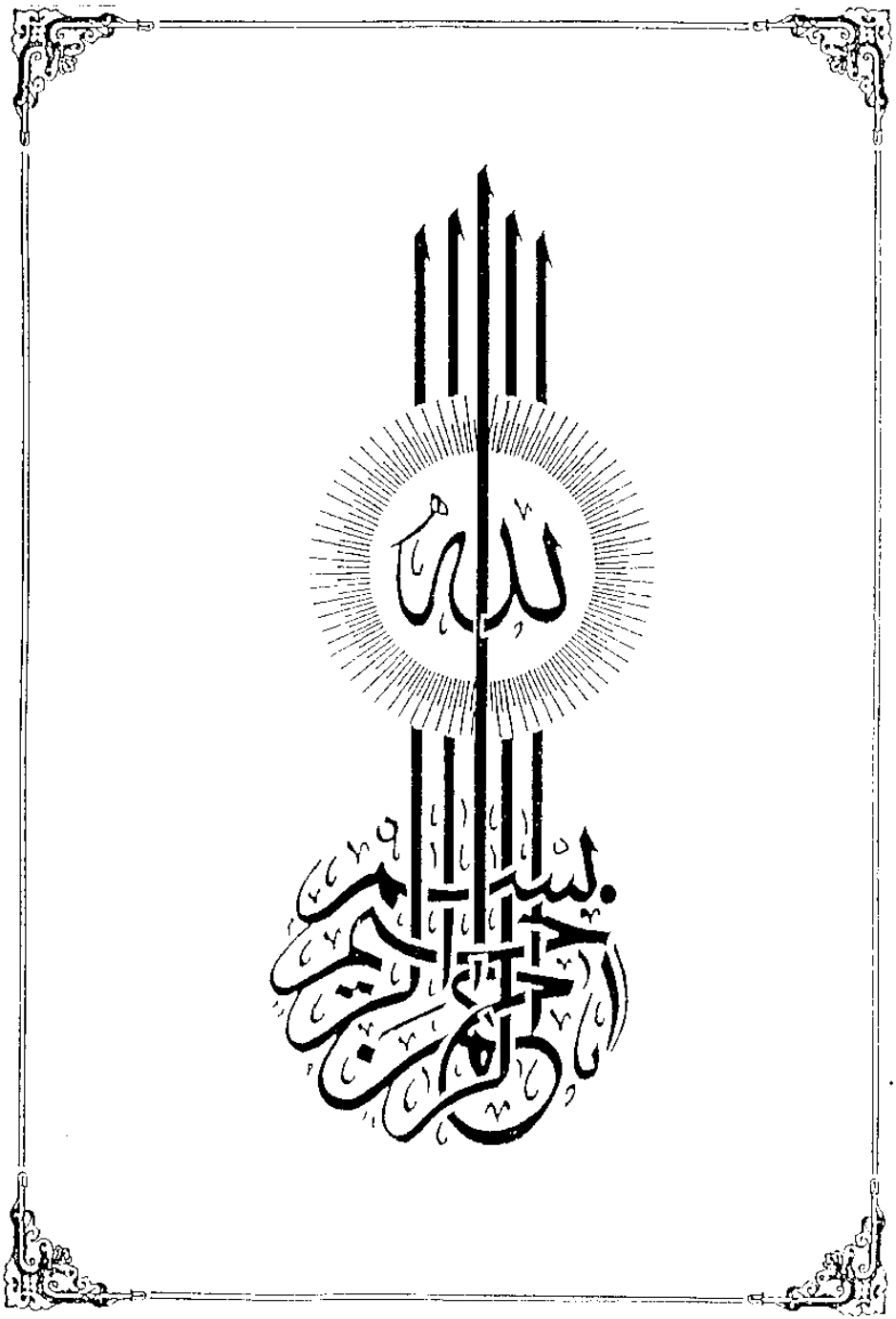

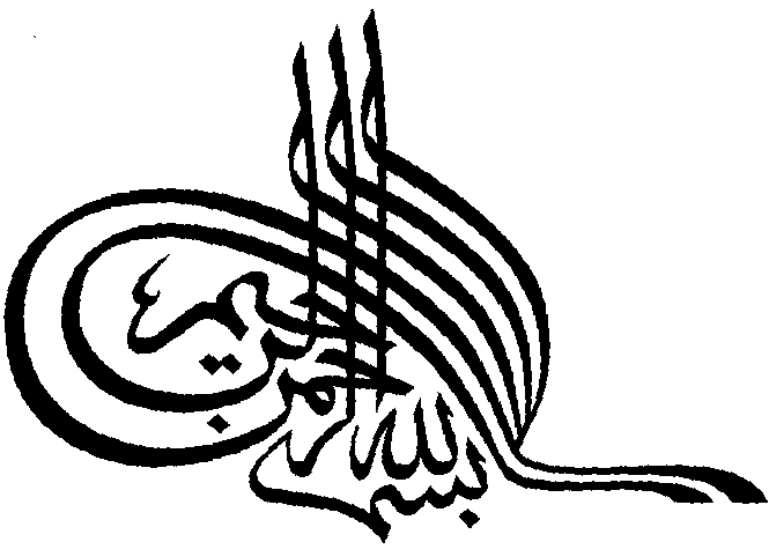

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Amr Moselhi

Contents

Introduction and Rationale

Perilymphatic fistulas (PLFs) are defined as defects in the otic capsule or its windows that allow leakage of perilymph from the inner ear perilymphatic space into the middle ear air spaces (Black et al., 1993). Despite controversy regarding the incidence of PLF; it is considered as a clinical entity by the majority of otolaryngologists (Hughes et al., 1990). The oval and round windows provide important points of pressure exchange between the middle ear and the perilymphatic space; as a result they serve as an anatomically vulnerable sites. Other less common sites are internal auditory canal and lamina cribrosa, fissula ante fenestram, microfissures extending from ampulla of posterior semicircular canal to round window and congenital anomalies. Sites of dehiscence and PLFs can also develop via trauma, infection, cholesteatomas, or neoplasm (Glassock, 1973 and Goodhill, 1981). Otologic surgery especially stapedectomy is the most common predisposing factor. Other factors include exertion, congenital malformations, congenital syphilis; however in a great number of patients no predisposing factor is found (Seltzer and McCabe, 1986).

Manifestations of PLF are hearing loss, tinnitus, aural fullness, dysequilibrium or a combination of these symptoms (Meyerhoff and Marple, 1994). However, Hughes et al. (1990) found that patients with PLF generally complain of auditory, vestibular and/or both symptoms, but there is no specific group of complaints pathognomomic of PLF. Seltzer and McCabe (1986) gathered clinical data from 91 patients with surgically confirmed PLF and found that 82% complained of auditory

symptoms with 8% complaining of hearing loss as the sole complaint. 81% complained of vestibular symptoms with 12% complaining of vestibular symptoms alone. Type of hearing loss and nature of vestibular complaint is variable. Hearing loss varied from sudden and profound to normal pure tones with fluctuation of speech discrimination percentage (SD%). Fluctuating SD% is an important complaint; it was the sole complaint; in 21% of patients.

PLF diagnosis is relatively non specific and overlap greatly with those seen in other otolaryngologic and neurologic diseases. PLF can be particularly difficult to differentiate from Meniere's disease (Weider, 1992).

A great deal of controversy associated with PLF is due to the lack of a sensitive, specific way of detection and thus diagnosis. The existing subjective clinical observations need to be replaced by an objective scientific methodology having higher specificity and sensitivity of detection of PLF (Meyerhoff and Marple, 1994). One of these objective tests is the fistula test, which is conducted when an abnormal opening between the otic capsule and the middle ear cavity is suspected. The principle of the fistula test is to apply direct pressure on the fluids of the inner ear, which if a fistula existed, would result in nystagmus and sensation of vertigo in the patient (Northern, 1975). However, the most common objective, sensitive, non invasive test for PLF's is electro-nystagmographic (ENG) recording of vestibular-ocular reflex. The ENG Fistula test is performed by systematically modulating external auditory meatus pressures + 200 to - 600 dapa (1 dapa= 1.02 mm H_2O) with the aid of a tympamic probe (Dapsit et al., 1980 & Seltzer and McCabe, 1986). Lucae was probably the first to describe conjugate deviations of the eyes, objective

nystagmus, loss of balance, spatial disorientation and nausea in a patient when air pressure in the middle ear was made higher or lower than ambient (Black et al., 1993).

Sensorineural Hearing Loss (SNHL) is a major symptom in PLF, however, there is no group of complaints pathognomonic of PLF as mentioned by Hughes et al. (1990). Early diagnosis of PLF allow their early management and hence improvement of the SNHL. Accordingly ENG fistula test is performed in this work to study prevalence of PLF as judged by clinical presentation.

AIM OF THE WORK

To estimate positivity of ENG fistula test in cases of SNHL with symptoms suggestive of PLF.