Electron microscopic histopathological changes of middle EAR mucosa in otitis media with effusion

Mahmoud Abd El Ghafar

The aim of this work is to study the electronmicroscopichistopathological changes in middle ear mucosaand drumhead in cases of chronic OME.Fifty patients suffering from chronic OME were selectedfrom Benha University Hospital. Their ages ranged between 5and 49 years, they were subjected to the followingprocedures :- Complete History taking.- Complete E.N.T. examination.- otoscopic examination and examination by the surgicalmicroscopy.- Audiometry and Tympanometry.- Biopsies from the middle ear mucosa and the drumhead weretaken and examined by the electron-microscope.Most patients were presented with hearing impairment,occasionally with tinnitus or earache. The main findingswere peripheral vascularization, of the drumhead with 1055of its luster. Its colour was changed and the middle earappeared not aeriated, occasionally hair line or air bubbleswere observed. Alteration in the mobility and retraction ofthe drumhead in chronic OME may be detected.Hearing impairment was in the form of a conductivehearing 1055 with an air-bone gap ranged between 20 40decibels in most of cases. All tympanograms were flat (”typeB”) only and cases with type C were excluded.Reversible and irreversible histopathological changesof the middle ear mucosa and drumhead could be seen.Reversible changes include oedema, mild fibrosis and earlyhyperplasia while irreversible changes were epithelial aslate hyperplasia, metaplasia, mucous glands formation andgoblet cells mUltiplication or they may be subepithelial aschronic inflammatory cells infiltration especiallylymphocytes and plasma cells and fibrosis with variabledegree.It is noted that many changes can occur together.Fibrosis of variable degree, interferes with blood supply ofthe epithelium and leads to its hyperplasia and dippingwhich later on may lead to cholesteatoma formation.According to our electron-microscopic survey we can saythat(1) Serous effusion type was associated with passivetransudation, extensive intercellular spaces andprofuse round cell infiltration. These were a resultof increased capillary permeability rather than due tosecretory condition of the middle ear epithelium.The migrating cells through the walls of bloodcapillaries and even thickened basal laminae of somecapillaries may be due to continuous repairingresulting from recurrent migration of fluid or cellsfrom the capillaries outside as was also reflected bynumerous RBcs escaping in the proprial connectivetissue.(2) Sero-mucoid type may be result from mucous secretoryprocess of the epithelial and subepithelial glands andalso result from increased capillary permeability atthe same time.In this regard, Lim and Shimada (1971) found

thatmiddle ear secretes not only mucus (Sade', 1966) butalso other protein sUbstances in a rather discretemanner. In this type of effusion, also ciliation couldbe observed as a defense mechanism and the cilia werefound to be present as a transitionary stage before thecondition can be transformed into mucoid type. In thisrespect, Lim and Klainer (1971) suggested that theproliferation of secretory elements is an expression ofincreased activity of the biologic defense system inthe middle ear. This system includes the mucociliary,enzymatic and immunochemical defense of the mucosa. so, anyproliferation of the secretory epithelium and numerousmicroglands present in OME may suggest that such a defensesystem is enhanced.Although Lim and Brick (1971) failed to detecttransformation of ciliated cells into secretory cells inhuman patients, this work supports the transformationphenomenon as it was described in the tracheal epithelium bySpondlin (1959).(3) Mucoid Type Mainly appears to result from activesecretion of the proliferated and metaplasticepithelium and subepithelial glands rather than to bedue to vascular disturbance.This conclusions supported by the presence of a .thickened basement membrane and fibrosis ofsubepithelial connective tissue and stratification ofepithelium and the less encountered intercellularspaces in comparison with the serous type. Theproliferation phenomenon in the middle ear epitheliumsupports Friedmann (1963) who believed that the natureof the middle ear epithelium was liable to proliferateinto secretory epithelium.