Summary and Conclusion

Magnetic resonance imaging (MRI),a new diagnostic imaging modality,is receiving a great deal of attention and is generating the most excitement in the medical community since the advent of the computed tomography in (1972) by Hounsfield . The reason for this excitement is the capability of MRI to generate high resolution,diagnostic quality,medical images at any angle and projection of the human body without ionizing radiation. Although MRI has come to the fore as a modality of medical imaging rather recently by P.C.Lauterbur,(1973), the fundamental phenomenon of nuclear magnetic resonance is much older discovery by Bloch & Purcell in 1946. Since the hydrogen proton is the most abundant element in all living tissues and has high magnetogyric ratio,it has excellent MRI characteristics suitable for imaging . The physical basis for MRI involves the interaction of the nuclei of a selected atom (hydrogen),with an external osillating (radiofrequency)electromagnetic field that is changing as a function of time at a particular frequency .

Creation of MR images involves use of a large resistive or superconducting magnet. Attached to this are magnets of lesser strenghth and an energy source. The selection of the planes,or volume of interest is controlled through a computer terminal. The opening in the magnet for the patient resembles the gantry in a CT scanner. The information provided in magnetic resonance imaging depends primarily on three tissue-specific parameters T1,T2 and proton density. In choosing special acquisition modalities (spin-echo,invertion recovery,FLASH,FISP) and varying acquisition parameters (repetion time TR and echo time TE) a multitude of variations in contrast between different tissues can be obtained.

Gadolinium-DTPA is water soluble contrast ,it shortens T1& T2 relaxation times in proportion to its concentration in the tissues,and concentrates selectively in pathologically altered tissues (tumour or inflammation). After reviewing the MRI characteristics for different pathological diseases involving the ENT, we presented our cases (sixty-four),forty-one males and twenty-three females,they range in age from two months to seventy-nine years,with a mean age of thirty-seven years. Thorough examination for all patients including history taking,general examintion,ENT examination,audiological investigations when needed and other imaging modalities been

done in selected cases as well . MRI was performed on a low strength MRI [Ultimate TM 3000 Fonar (USA),o.3 Tesla].

Endoscopy was done in some of the patients and tissue biopsy was taken to correlate with MRI diagnosis. The aim of this study is to clarify the impact of MRI as a new capable diagnostic modality in the diagnosis of Ear,Nose and Throat diseases.

Patients were classified according to the anatomical sites into cerebello-pontine angles (13 cases),mastoid &middle ear (7 cases),nose &paranasal sinuses (11 cases),pituitary gland lesions (10 cases),and throat lesions (23 cases), the last group has been subdivided into oral cavity (3 cases),nasopharynx (11 cases),oropharynx (one case),larynx (5 cases) and salivary gland (3 cases). Thirty cases were presented in details.

Regarding the first group of patients , MRI proved to be the most sensitive and accurate diagnostic modality in the CPA. All pathological varieties either vascular or non-vascular mass lesion have been clearly visualized . One of the major advantages of such examination is the non-use of the iodinated contrast media for the diagnosis of the vascular CPA lesions e.g. aneurysm and glomus juglare. Another advantage of MRI when compared to CT scan is the clear separation of the 7th & 8th nerve and hence ,we could detect early mass lesion along the course of the intracanalicular nerve as small as 3 mm .

The mastoid and middle ear group of patients showed that MRI carries a rather limited application due to the poor sensitivity of this modality in detection of cortical bony and ossicular changes.

We concluded also regarding the nose and paranasal sinuses cases that only complicated cases of sinusitis as well as sinus and nasal neoplastic lesions deserve to be studied by MRI to evaluate properly the extension of the lesion and the involvment of surrounding vital structures.

ENT microsurgery nowdays has expanded to include pituitary surgery. MRI provides full information about pituitary gland micro- & macro-neoplasms, extension and operability .

MRI proved to be the best diagnostic modality for detecting pharyngeal mass lesion and neoplasms due to the best soft tissue contrast it offers and the multiplanar capability of this technique. Proper pre-operative planning needs a proper MRI study.

Although,we presented in our study few cases of cancer larynx, we believe that MRI is an accurate diagnostic modality for diagnosis and staging of cancer larynx. Early mucosal changes in signal or thickening could be visualized . The subglottic extension of

the larynx is nicely demonstrated in both the axial and coronal planes. Cartilage invasion could be also well visualized .

We also recommend MRI examination for the parotid gland when malignancy is suspected for proper and accurate evaluation of the texture of the mass lesion and its extent.

Contrasting with the high sensitivity of MRI , we should notify that it is not currently able to provide a histologic diagnosis in the vast majority of instances.