

THE ROLE OF COMPUTED TOMOGRAPHY AND MAGNETIC RESONANCE IMAGING IN ASSESSMENT OF PATIENTS PRESENTING WITH ORBITAL APEX DISORDERS

Salah Al Din Desouky Abo Elenin, Hesham Ali Ibrahim*, Moataz Mohamed Montasser, Rania El-Sayed Mohamed Abdel-Halim Shams El-Din
Department of Radio-Diagnosis and Intervention, Department of Ophthalmology*, Faculty of Medicine, Alexandria University.

INTRODUCTION

Orbital apex disorders include three groups of disorders: orbital apex syndrome, superior orbital fissure syndrome and cavernous sinus syndrome.

The most common clinical features of a disease process in the orbital apex are blurred vision, retro-orbital pain and painful ophthalmoplegia as well as proptosis.

These disorders are classified based on etiology into traumatic, infectious, inflammatory process neoplasms, vascular disorders and developmental causes.

Neuro-imaging is mandatory in patients with orbital apex syndrome. Brain and orbit MRI are the imaging modality of choice and should be performed with gadolinium in case of suspected inflammatory conditions like sarcoidosis. Tolosa Hunt Syndrome, nonspecific orbital inflammatory disease, also in neoplastic and traumatic conditions. MRI with fat suppression sequences is ideal for evaluating the orbital apex and cavernous sinus. Computed tomography (CT) can be helpful in bone assessment and when MRI is contraindicated.

AIM OF THE WORK

The aim of this study was to assess the role of CT and MRI in evaluation of patients presenting with symptoms of orbital apex disorders.

PATIENTS AND METHODS

PATIENTS:

The study was conducted on 20 patients having symptoms of orbital apex disorders referred from ophthalmology department to radiology department at Alexandria main University hospital, during the period from May 2020 to July 2022.

METHODS:

All patients that fulfill the inclusion criteria were subjected to the following:

- Full history taking and thorough clinical examination made by ophthalmologists.
- Laboratory investigations namely serum Creatinine level.
- **Imaging evaluation:** One case performed non-contrast CT study only, 9 cases were evaluated by contrast enhanced MRI only and 10 cases performed both non-contrast CT and contrast enhanced MRI assessments.
- Follow up of the patient (clinical, operative data or pathology) whenever possible.

RESULTS

ILLUSTRATIVE CASE: A 66 years old female patient presenting complained of right nasal obstruction, mucoid rhinorrhea and low grade fever as well as right cheek swelling and right visual complaints as minimal right eye proptosis, edema and ophthalmalgia. She had medial history of uncontrolled diabetes mellitus.

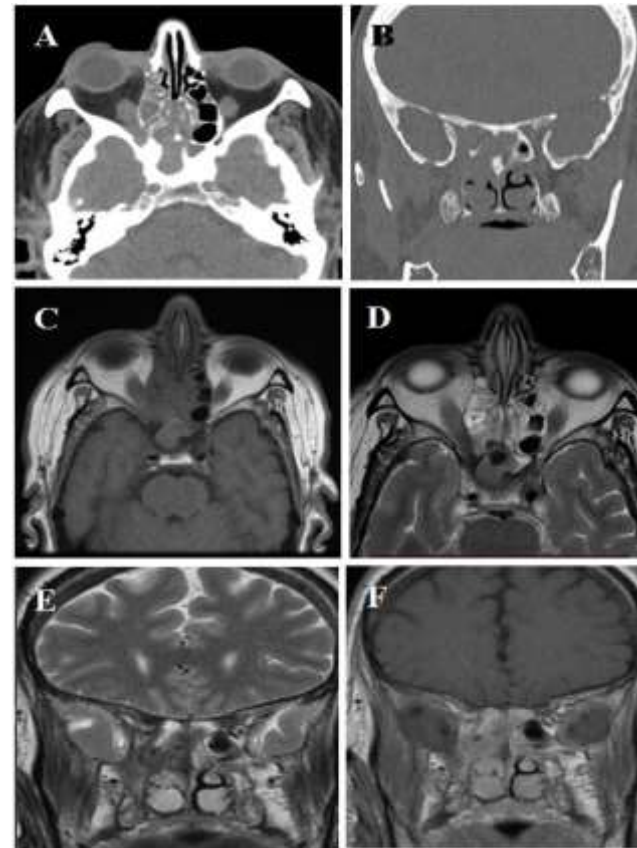


Figure: shows a case of invasive fungal sinusitis with the following imaging characters.

(A) axial CT soft tissue window: mucosal thickening involving both sphenoid sinus and ethmoidal air cells.

(B) coronal CT soft tissue window: showed extension through right inferior orbital fissure to the right orbital apex.

(C) axial T1: the opacified sinuses shows isointense signal in T1.

(D&E) axial and coronal T2: shows hypointense signal in T2.

(F) coronal T1 post contrast : show intense homogenous enhancement of the extra-osseous soft tissue sheets, the mass is seen extends to the right pterygopalatine fossa is seen as well as extension to the right orbital apex is seen with soft tissue tumefaction at inferior orbital fissure, superior orbital fissure as well as optic canal.

Diagnosis: invasive fungal sinusitis with right orbital apex extension.

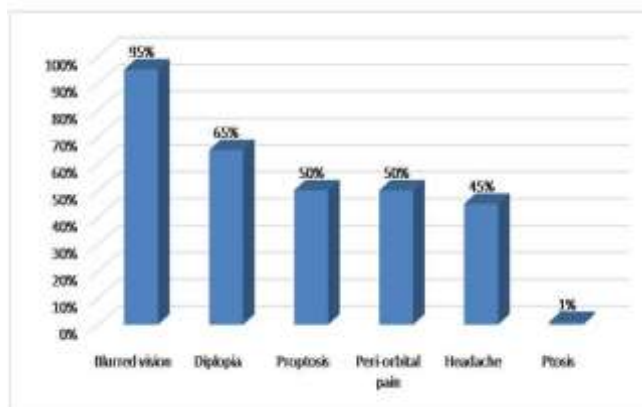


Figure2: Distribution according to clinical history

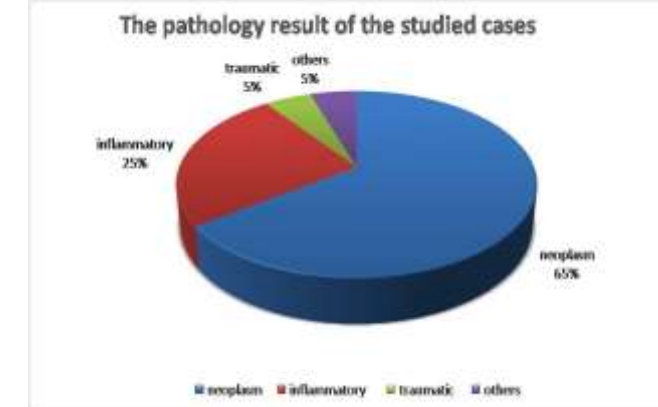


Figure3: The pathology result in the study population.

Among the twenty patients, neoplasm was the leading cause of OAS, accounting for 13 cases representing 65 %, followed by inflammatory causes accounting for 5cases representing 25% and trauma-related causes accounting for 1 case representing 5% with only case of mucocele representing 5 %.

Among the 13 cases of neoplasms, 3 cases were diagnosed as lymphoma (15%), 3 cases were diagnosed as meningioma (15%), 2 cases were diagnosed as nasopharyngeal carcinoma (10%), one case of optic pathway glioma (5%), one case of pituitary macro-adenoma (5%), one case of juvenile angio - fibroma (5%), one case of chondrosarcoma (5%), one case of fibro-osseous lesion (5 %).

Among the inflammatory causes, one case of Tolosa Hunt syndrome (5%), one case of orbital pseudo-tumor (5%), one case of sarcoidosis (5%), two cases of invasive fungal sinusitis.

Most of patients presented with blurred vision 19 cases, representing 95% associated with other symptoms. The commonest associated symptoms were diplopia found in 13 cases (65%), proptosis in 10 cases (50 %) and peri-orbital pain in 10 cases (50 %)..

CONCLUSION

The current study concluded that:

- MDCT is the preferred and the primary modality in evaluation of inflammatory diseases as depicting mucosal thickening in sino-nasal lesions extending to the orbit as well as orbital fat.
- MDCT allows easy appreciation of bony abnormalities and detection of fractures and calcification.
- MRI is optimal for soft tissue mapping as evaluation of extension or infiltration of lesion and detecting peri-neural tumor spread, associated cavernous sinus, optic canal as well as superior orbital fissure involvement.