THE ROLE OF MEDICAL IMAGING IN DIAGNOSIS OF COMPLICATIONS OF INFLAMMATORY PARANASAL SINUSES DISEASES

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Introduction

Complications of sinusitis can be divided into local, orbital, and intracranial. These serious and life-threatening complications require early diagnosis to decrease morbidity and mortality. The first step for evaluation of these processes is to understand the anatomy of the sinuses and their common anatomic variants.
When complications are suspected, otolaryngologists do not always understand when CT or MRI is necessary to confirm the diagnosis and to determine the treatment protocol or the need for urgent surgery so diagnosis of such complications requires multi-disciplinary approach with imaging modalities. Computed tomography (CT) is considered the imaging modality of choice in sinusitis which is supplemented with Gadolinium enhanced MRI when complications are suspected especially the intracranial one.
Computed tomography is the best for assessment of mucosa and bony anatomy of the paranasal sinuses whereas MRI is better for soft tissue evaluation and it is superior to CT in the diagnosis of intracranial complications.

Aim of the work

The aim of the study was to assess the role of medical imaging in diagnosis of complications of inflammatory paranasal sinuses diseases.

Patients

This prospective study was carried on 20 patients presented with signs and symptoms of sinusitis with suspected extra-sinus extensions (ocular or neurological manifestations), presented to the radio-diagnosis department of Alexandria University Hospital for medical imaging.

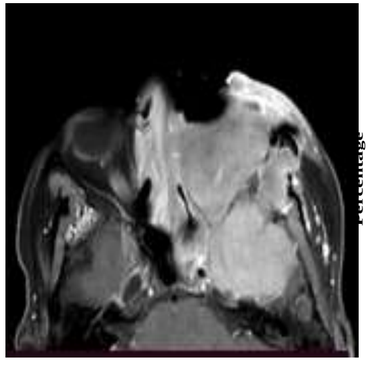
Methods

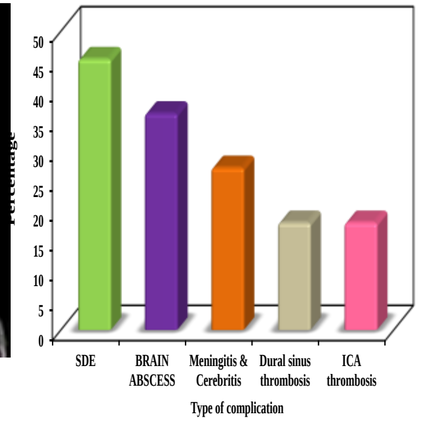
Contrast enhanced multi-detector computed tomography of PNS was performed for six patients while Gadolinium enhanced MRI was performed for 14 patients with complementary non enhanced CT was done for seven cases.

CT was performed using 64 high resolution CT scanner (Siemens medical systems) with scan parameters (kVp: 120-140 , slice thickness 0.5-1mm and reconstruction interval 0.3mm). Images were obtained in both soft and bone windows and analyzed with multi-planner reconstruction methods.
Gadolinium enhanced MRI of PNS was performed for 14 patients using closed 1,5 Tesla magnet , Philips machine . Images were obtained in axial, coronal and sagittal spin echo T1WI and T2WI with axial FLAIR cut for brain and DWI was obtained in axial single- short spin echo planar then contrast enhanced MRI was performed . Complementary non contrast CT was performed for seven patients.

Results

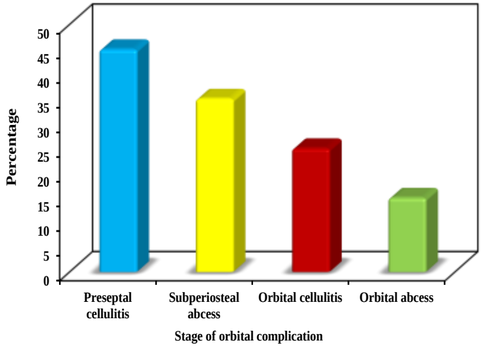
Imaging findings of intracranial complications of sinusitis was seen in eleven cases as follows: subdural empyema in five cases (45.4%) , brain abscess in four cases (36.3%) , cerebritis and meningitis in three cases (27.2%) , dural sinus and internal carotid artery thrombosis in two cases(18%).





Distribution of patients according to type of intracranial complication

As regards imaging findings of orbital complications of sinusitis, they were seen in thirteen cases as follows: preseptal cellulitis in nine cases(45%), orbital cellulitis in seven cases (35%) , subperiosteal abscess in five cases (25%) and orbital abscess in three cases (15%).



Distribution of patients according to stage of orbital complications

Conclusion

It was shown that medical imaging (CT and MRI) has a crucial role in diagnosis of different complications of rhino-sinusitis with high diagnostic value reflecting upon management and outcomes.
CT and MRI should be performed for every case with significant orbital or intracranial infective process.
MDCT and MRI are efficient diagnostic modalities in differentiation between stages of orbital infections: preseptal cellulitis, orbital cellulitis, subperiosteal abscess and orbital abscess.
MRI is a reliable diagnostic tool for delination of different intracranial infections: subdural collections, brain abscess, meningitis, cerebritis and dural sinus thrombosis