

ROLE OF MAGNETIC RESONANCE IMAGING IN DIAGNOSIS OF OPTIC NERVE LESIONS

Salah Eldin Desouki Abou Elenin, Omneya Ahmed Gamal Eldin, Mai Abdelnabi Mohammed Elbahwash\*, Ahmed Mohamed Mahmoud Mahmoud Abd-Elrafea  
Department of Radiodiagnosis, Ophthalmology\*, Faculty of Medicine, Alexandria University.

INTRODUCTION

Optic nerves are the second pair of cranial nerves and are unique as they represent an extension of the central nervous system and, hence, are myelinated by oligodendrocytes. They are the connection between eyes and brain, i.e. they relay visual impulses from retina to brain. Hence, most often, optic nerve abnormalities are associated with brain abnormalities.

A wide variety of benign and malignant conditions may affect the optic nerve resulting in optic neuropathy. Clinical and laboratory findings alone do not always allow to correctly localize a lesion along the course of the optic nerve, nor is it possible to precisely identify the underlying cause. Therefore, optic neuropathy has become a common indication for imaging.

This article provides an overview of the imaging findings of diseases affecting the optic nerve with special emphasis on clinical-radiological correlation and on the latest technical developments in MR imaging deals with tumors, toxic/nutritional and degenerative entities, inflammatory and infectious diseases, compressive neuropathy and vascular conditions involving the optic nerve from its ocular segment to the chiasm.

AIM OF THE WORK

The aim of the work was to show the role of MRI in diagnosis of different optic nerve lesions.

SUBJECTS AND METHODS

**Patients:** The study will be conducted on twenty patients of different ages who complain of neurological symptoms and signs that suspect optic nerve diseases. Those patients have been examined at the department of ophthalmology and directed to the department of radiodiagnosis at Alexandria main university hospital.

**Methods:** All patients that fulfill the inclusion criteria were subjected to:

- 1. Full history taking, including age, sex, and complains.
- 2. Clinical examination including general and ophthalmologic examination.
- 3. CT scanning in in some cases of bone affection by tumours.
- 4. MRI study.

RESULTS

Analysis of MRI diagnosis in the study cases showed that 5 (25%) of the studied cases were diagnosed as Meningioma involving the optic nerve, 3(15%) of the studied cases were diagnosed as optic nerve glioma, 3(15%) of the studied cases were diagnosed as optic nerve infarction, 2(10%) of the studied cases were diagnosed as isolated optic neuritis, 2 (10%) of the studied cases were diagnosed as Multiple sclerosis associated with optic neuritis, 2 (10%) of the studied cases were diagnosed as Neuromylitisoptica, 2(10%) of the studied cases were diagnosed as idiopathic intracranial hypertension and 1(5%) of the studied cases were diagnosed as Sarcoidosis associated with optic neuritis.

Table : Analysis of MRI diagnosis in the study cases.

	Study cases (n= 20)	
	Frequency	Percent (%)
Meningioma involving the optic nerve	5	30
optic nerve glioma	3	15
optic nerve infarction	3	15
Multiple sclerosis associated with optic neuritis	2	10
Neuromylitisoptica	2	10
Isolated optic neuritis	2	10
Idiopathic intracranial hypertension	2	10
Sarcoidosis associated with optic neuritis	1	5

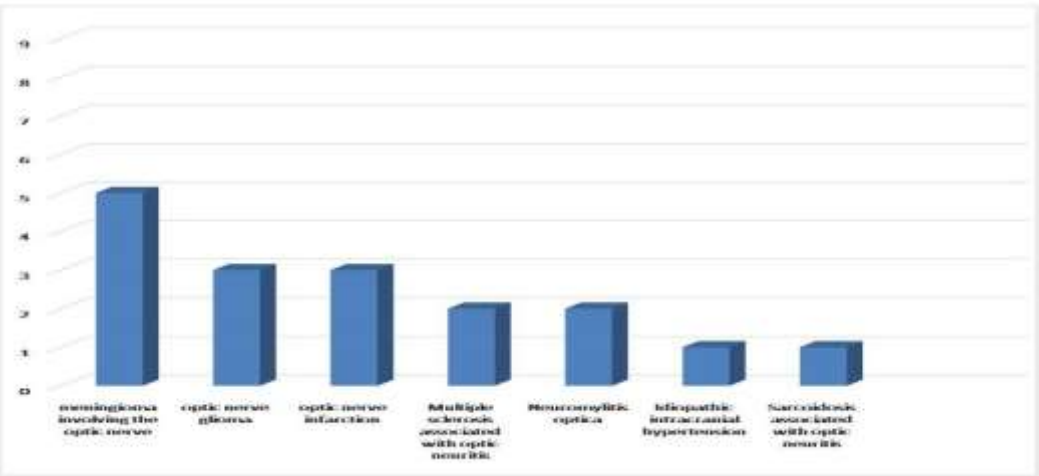
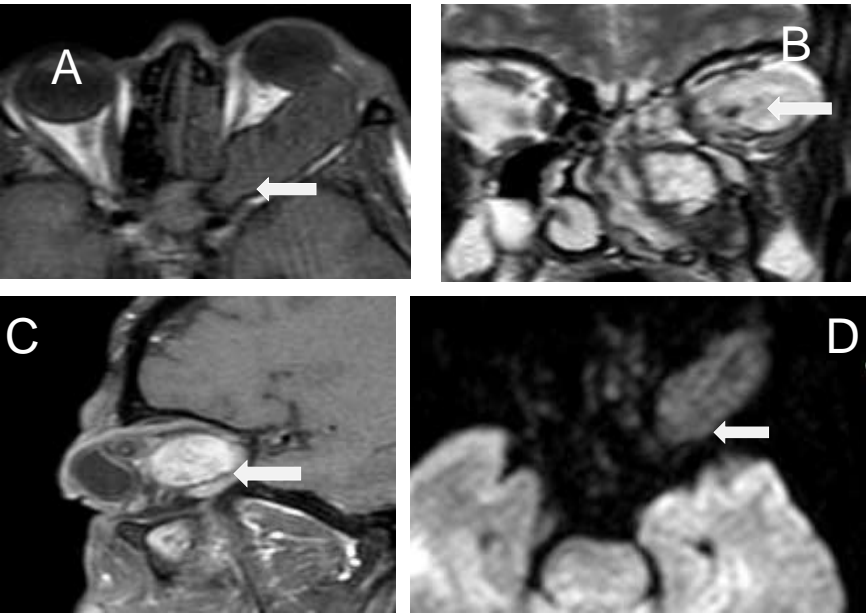


Figure 1: Analysis of MRI diagnosis in the study cases.



**Figure 2:** 36 Years old male patient complaining of left side blindness. The left intraorbital optic nerve is infiltrated by a well defined heterogenous isointense lesion on axial T1 (A) (white arrow), heterogenous hyperintense on coronal T2 (B) (white arrow) and shows heterogenous contrast enhancement on sagittal T1(white arrow) with diffusion restriction (D) (white arrow). There is fusiform enlargement of the left optic nerve with the nerve indistinguishable from the tumour. **Diagnosis:** Left intraorbital optic nerve glioma.

CONCLUSION

**The current study concluded that:**

Imaging of the optic nerve requires a thorough understanding of the anatomy, function, clinical symptoms related to malfunction, as well as its key pathologies. Depending on the clinical situation, tailored examinations are necessary.

High-resolution MR studies with tailored dedicated protocols allow recognition of a multitude of pathologic conditions like differentiation between optic nerve meningioma and glioma depending on preservation of the optic nerve which was seen with optic nerve meningioma.