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Original Research Paper

Radio-Diagnosis

A PROSPECTIVE STUDY OF RADIOLOGICAL IMAGING OF INTRACRANIAL SPACE OCCUPYING LESIONS IN A TERTIARY CARE CENTRE.

Dr. Peddi Sreelekha Final year Post Graduate, Department of Radio diagnosis, GEMS AND Hospital, Andhra Pradesh, India

Dr. B. R. Nagaraj MDRD, DMRD, FICR, Professor and HOD, Department of Radio diagnosis, GEMS AND Hospital, Andhra Pradesh, India

ABSTRACT **Background** Planning the necessary intervention for ICSOLs requires an early diagnosis due to their significant morbidity and mortality. The study presents an investigation of sixty instances of Intracranial Space Occupying Lesions (ICSOL), encompassing both neoplastic and non-neoplastic masses that were detected and treated at GEMS AND HOSPITAL SRIKAKULAM during a 12-month duration. The diagnosis was made using an MRI and CT scan.

KEYWORDS : ICSOL, Neoplastic, Non-Neoplastic, MRI, CT.

INTRODUCTION

Intra-cranial space occupying lesion" (ICSOL)is a mass lesion in the cranial cavity with varying etiologies, such as a neoplasms, an inflammatory or parasitic lesion, a hemorrhage, or an arterio-venous malformation. The majority of ICSOL patients will have tumors, which are followed by traumatic and infectious causes. Gliomas are the most prevalent of them, followed by Tuberculoma, meningiomas, abscesses, and pituitary tumors. Neoplasms of the central nervous system are a distinct and diverse group of neoplasms, accounting for 1.9% of all malignant tumors in India. Both clinically and radiologically, a wide range of non-neoplastic illnesses can mimic a brain tumor. To distinguish between neoplastic and non-neoplastic imitators, these individuals require biopsy. The main presenting symptoms of patients with ICSOL includes headache,loss of consciousness, seizure & vomiting. The most common clinical signs includes altered sensorium, behavioural changes & visual field defects and other nonspecific signs and symptoms.

AIM AND OBJECTIVES

Aim of Study

To study the role of radiological imaging in evaluation of intracranial space occupying lesions

Objectives of the Study

1. Identification and confirmation of the presence of a mass
2. To study the multiplicity and localisation of various intracranial space occupying lesions (ICSOL) and their impact on surrounding structures.
3. To study imaging features of different intracranial space occupying lesions.

MATERIALS & METHODS

A prospective cohort study carried on 60 patients having clinical signs & symptoms of ICSOL referred to Radio diagnosis department, Great eastern medical school & hospital.

Inclusion Criteria:

- Patients of adult age group and both sexes willing to give consent for examination.
- Clinically suspected cases of intracranial SOL
- Cases which were confirmed to have ICSOL on CT.

Exclusion Criteria:

- Patients with contraindications to MR Imaging.
- Intracranial hematomas & Infarct
- Demyelinating lesions
- Lesions less than 2 cm.

RESULTS

Out of total 60 patients enrolled for the study most patients were in age range of 21 – 50 years & the mean age was 35.5 years. 36 (60%) patients were female & 24 (40%) patients were males.

The main presenting symptoms of patients were head ache, loss of consciousness, seizure & vomiting and associated signs of altered sensorium, behavioural changes & visual field defects.

Table 1. Gender wise distribution of patients

Gender	frequency	%
female	36	60
male	24	40
Total	60	100

Table 2. Distribution of patients according to the multiplicity of lesions

Lesions	frequency	%
Solitary	44	73
Multiple	16	27
Total	60	100

Table 3. Distribution of patients according to the location of lesions

a.

INTRA/ EXTRA AXIAL	Frequency	%
Intra axial	48	81
Extra axial	12	19
total	60	100

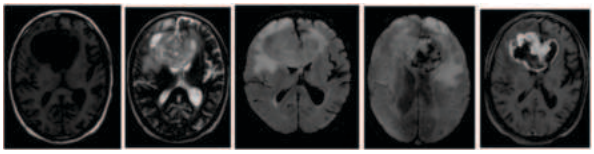
b.

Supra /infra tentorial	Frequency	%
Supra tentorial	34	56
Infra tentorial	24	34
Total	60	100

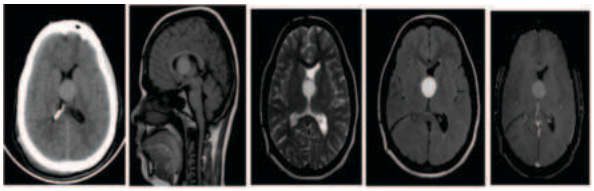
Table 4. Incidence of Different Lesions

S.no	LESIONS		INCIDENCE
1.	Meningiomas	15	25
	Gliblastoma multiforme	9	15
	Astrocytoma	7	11.6
	Pituitary macroadenoma	7	11.6
	Oligodendroglioma	3	5
	Abcess	7	11.6
	Metastasis	5	8.3
	Arachnoid cysts oligodendroglioma	3	5
	Tuberculoma	3	5
	Colloid cysts	2	3.3
	Total	60	100

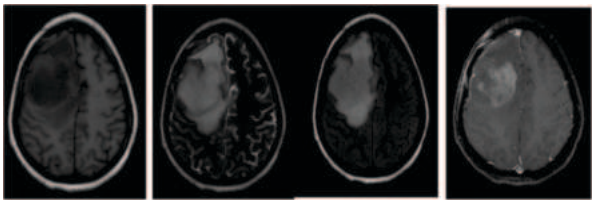
Imaging Findings



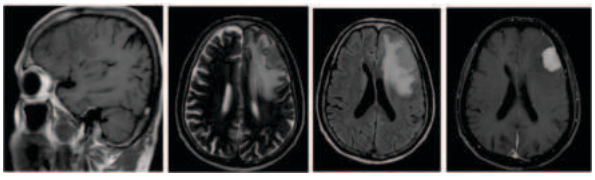
Case 1:Axial T1/T2/FLAIR/GRE/T1+C MR images of 80 year old male patient showing classical Glioblastoma multiforme.



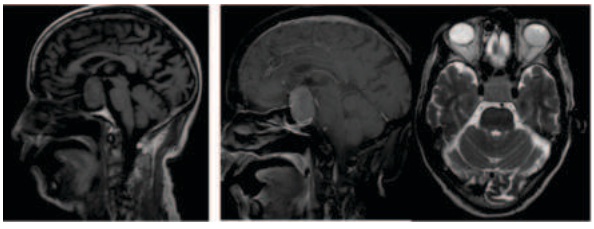
Case 2; Axial CT/T1 sag/T2/FLAIR/T1+C ,MR images of 42 yr old female showing Colloid cyst at foramen of Monro with dilated left lateral ventricle



Case 3;Axial T1/T2/FLAIR/T1+C images of 32 yr old female showing biopsy proven Diffuse astrocytoma



Case 4:Saggital T1 and Axial T2/FLAIR/T1+C images of 32 yr old female showing Extra axial intensely enhancing lesion with dural tail sign and mass effect in left frontal region suggestive of Meningioma



Case 4:Saggital T1/T1+C/Axial T2images of 65 year old male showing Pituitary Macroadenoma

DISCUSSION

Any lesion, whether malignant or inflammatory in origin, that raises the volume of intracranial contents and elevates intracranial tension (ICT) is commonly referred to as an ICSOL.

With the greater accessibility of modern imaging techniques like CT and MRI, the presentation of ICSOL has changed radically. In the current study, the age varies from 20 to 60 years.

The fifth decade, had the highest frequency (28%), with a female predominance in the fourth decade (16%). The ratio of men to women was 2:3.In the fourth and fifth decades, the majority of lesions were found, with a male-to-female ratio of 1:1.5.

The most common symptoms was headache, the second common presenting complaint in our study was loss of consciousness followed by convulsions,nausea,vomiting etc. 33 cases (56%) were supratentorial, 24(34%) cases were infratentorial and 1 (2%) lesion was both supra and infratentorial in location.In our study, 81% lesions were intra-axial and 19% extra-axial. Chander R et al[9] study concluded that 64% lesions were intra-axial and 15% extra-axial, which was nearly corresponding to our study. In present study, the incidence of different lesions were as follows- meningiomas (25%), GBM 15%, anaplastic astrocytomas 11.6%, pituitary macroadenoma 7%, abscess7 %, metastases 5%, oligodendroglioma 3%, arachnoid cyst 3%, tuberculoma 3%, and colloid cyst 2%.In our study, meningiomas were the most common neoplastic lesion.

The CSF cleft, displaced subarachnoid spaces, cortical grey matter between mass and white matter, large dural base, and nearby bony reaction are salient characteristics of the lesions in extra-axial location.

Irregular, ill-defined outline, invasive nature, contrast enhancement and metastasis are Classical features of malignant tumors.

CONCLUSION

For intracranial space occupying lesions radiological investigation is a reliable diagnostic tool. Imaging of cerebral space-occupying lesions gained a new dimension with the advent of CT and MRI scanning, making it possible to characterize lesions and provide high anatomical detail in the axial, sagittal, and coronal planes.

These techniques have aided in the early detection and localization of the SOL and should be viewed as valuable supplementary and supportive tools to histological diagnosis. With the introduction of more advanced MRI modifications like MR spectroscopy and more advanced techniques like MR perfusion, MRI continues to be the primary line of study for the diagnosis and evaluation of intracranial space-occupying lesion with a reasonable degree of diagnostic accuracy.

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