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Low field MR imaging of sellar and parasellar lesions: Experience in a developing country hospital

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ABSTRACT

Background: Magnetic resonance imaging (MRI), an advancement which followed computed tomography (CT) is expensive and inaccessible in most developing countries. However it is the procedure of choice in evaluating sellar and parasellar lesions. Its major advantages are its superior soft tissue contrast differentiation, its capacity for multiplanar imaging and nonexistence of ionising radiation. Its use is relatively new in Nigeria, a developing economy in Africa. Since its introduction in 2005, it has been utilised extensively for neuroimaging at the University College Hospital (UCH), Ibadan; a large hospital in south-western Nigeria.

Objective: To review the role and pattern of low field MR Imaging in sellar and parasellar lesions presenting to a tertiary care centre in Nigeria.

Methods: All 62 patients with clinically suspected sellar and parasellar masses, referred to the Department of Radiology, UCH Ibadan for MRI between December 2006 and January 2010 were retrospectively analysed. The examinations were performed using an open 0.2 T permanent magnet MR unit. T1W, T2W, T2/FLAIR, TOF and T1W post gadolinium DTPA sequences of the sellar region were obtained.

Results: Of the 62 patients, there were 27 males and 35 females. The modal age group was 40–49 years with a mean age of 39.94 years (±16.65 years). Twenty-four cases (38.7%) had histological diagnosis, of which 20 (83.3%) were consistent with initial MRI diagnosis. Pituitary adenomas were the commonest (58.06%) lesions of the sellar and parasellar regions. Others include parasellar meningiomas, craniopharyngiomas, and giant aneurysms. Headache and visual impairment were the major presenting features and showed no significant correlation with tumour size.

Conclusion: The use of low field MRI in the diagnostic evaluation of patients with suspected sellar or parasellar lesions in developing countries of low economic resource is commendable as it provides beneficial outcomes in management.

1. Introduction

The anatomy of the sellar and parasellar region is complex and the pathology diverse [1,2]. Although most sellar lesions are due to pituitary adenomas, a number of other pathologies involving the parasellar region can present in a similar manner. Many different imaging modalities have been used for the assessment of this region [3].

The introduction and widespread use of computed tomography (CT) and more recently multi-detector CT (MDCT) has rendered its imaging predecessors, such as plain skull radiographs, pluridirectional tomography, and conventional angiography obsolete [4]. Magnetic resonance imaging (MRI), an advancement which followed CT is more expensive and inaccessible in most developing countries. Since its availability in sub-Saharan Africa, considerable amount of experience has been gathered regarding its use in evaluating lesions of the brain and spine. MRI is the modality of choice in the evaluation of sellar and parasellar lesions [4]. Its major advantages are its superior soft tissue contrast differentiation and its capacity for multiplanar imaging. In addition, it does not use ionizing radiation or produce bony artefacts as CT. Nonetheless CT is preferred for evaluating calcification and bony detail.

We present our initial experience in demonstrating the MRI and histopathological features of sellar and parasellar lesions at our hospital, in south-western Nigeria with a brief topical review of the common lesions.

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Table 1
Distribution of clinical presentation of sellar and parasellar tumours.

Presenting clinical feature	*N*	%
Headache	28	29.40
Visual impairment	27	28.42
Paraparesis/hemiparesis	9	9.47
Hormone imbalance	7	7.36
Seizures	5	5.26
Cranial nerve palsy	5	5.26
Dizziness/vertigo	2	2.11
Others	12	12.63

Most patients presented with multiple symptoms.

2. Materials and methods

We retrospectively analysed MR examinations of 62 patients with clinically suspected sellar and parasellar masses who presented at the University College Hospital (UCH), Ibadan, Nigeria between December 2006 and January 2010 (36 months). The examinations were performed using a low field open MRI unit (0.2 T Siemens Magnetom permanent magnet).

Scanning sequences included axial, sagittal and coronal T1-weighted images employing TR 500–700 ms, TE 20–30 ms, 3–5 mm slice thickness with a 0–1.5-mm gap depending on tumour size; 256 × 256 matrix, four excitations, and 16–20-cm field of view. Additionally, T2-weighted coronal images were performed with scanning parameters of TR 2000 ms, TE 50 and 100 ms, 3–5 mm slice thickness with 0–1.5-mm gap, 256 × 256 matrix, one excitation, and 16–20-cm field of view. The protocol used also consisted of, gadolinium DTPA enhanced coronal and transverse T1-weighted images. A T2/FLAIR (fluid attenuated inversion recovery) and TOF (time of flight) sequences were performed only when it was thought that it would provide useful additional information. The most common reasons were to differentiate low T1 signal masses from cerebrospinal fluid (CSF); to delineate peritumoral oedema more clearly or to demonstrate the extent of lesions invading the brain parenchyma.

3. Results

The patients consisted of 27 males and 35 females with a 1:1.3 male to female ratio. Their ages ranged from 2 to 75 years with a mean of 39.94 years (±16.65 years). The modal age group was 40–49 years. The major clinical presentations were headaches in 28 patients (29.40%) and visual impairment in 27 patients (28.42%). Seven patients (7.5%) presented with endocrine abnormalities (Table 1).

Table 2
Distribution of MRI diagnosis of sellar and parasellar tumours.

MR diagnosis	*N* (%)
Pituitary adenoma	
Macroadenoma	34 (54.84)
Microadenoma	2 (3.22)
Meningioma	8 (12.90)
Craniopharyngioma	3 (4.83)
Astrocytoma	2 (3.22)
Glioma	2 (3.22)
Rathke's cleft cyst	2 (3.22)
Persistent septum pellucidum	1 (1.61)
Metastasis	1 (1.61)
Giant carotid artery aneurysm	1 (1.61)
Total	62 (100)

Of the patients with visual impairment, 74.1% (20/27) had pituitary adenoma while 25.9% had other lesions. Over 50% (20/36) of all patients with MRI diagnosis of pituitary adenoma including the microadenomas presented with visual impairment. The duration of visual symptoms in all these patients varied from 2 weeks to 20 years with an average of 37.8 months.

Of the 62 patients, 36 (58.1%) had pituitary adenomas (Table 2). Of these, 20 were males while 16 were females. On MRI images, 34 of pituitary adenomas were macroadenomas with an average linear height of 3.33 cm (±0.77, range 1.05–5.2 cm) (Fig. 1). Twenty-four of these tumours (75%), extended into the suprasellar cistern. They were all somewhat isointense relative to gray matter on T1 images, and showed smooth outlines with homogenous post gadolinium enhancement. Two cases however showed intralesional cystic spaces

Only two microadenomas measuring an average of 0.64 cm in vertical dimension on coronal T1-weighted post contrast images were demonstrated (Fig. 2). Table 2 shows the distribution of all lesions including 8 meningiomas, 3 craniopharyngiomas, and 2 Rathke cleft cyst (Fig. 3).

The meningiomas in our series represent the second commonest diagnosed tumour of the parasellar region (12.9%). Seven of the 8 meningiomas in our series occurred in women with an average age of 52 years. They arose from both suprasellar ($n = 3$) and parasellar ($n = 5$) locations. Only one patient with a suprasellar meningioma had vision defects caused by compression of the optic chiasm. Peritumoral oedema, best detected on T2-weighted images was seen in three of our cases. A 'dural tail' feature was observed in 2 cases in our series and was not seen in any other lesion.

All cases of craniopharyngioma in this series were primarily suprasellar with two of the three tumours occurring in children. All lesions showed some degree of signal heterogeneity.

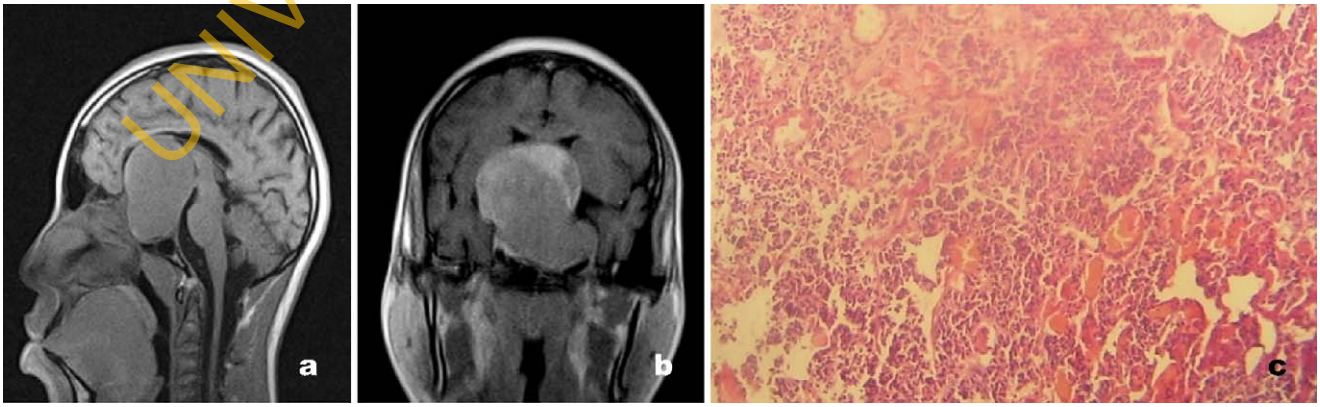

Fig. 1. Macroadenoma (a) and (b) sagittal and coronal T1 weighted MR Image demonstrates a partially hyperintense mass on T1W, 43 mm in vertical dimension arising from the sella turcica. The mass displaces the optic chiasm superiorly, invades the cavernous sinuses. (c) Photomicrograph (original magnification, 400×; H–E stain) shows nests of uniform epithelial cells that are divided by a network of delicate capillaries within fibrous strands (so-called organoid pattern).

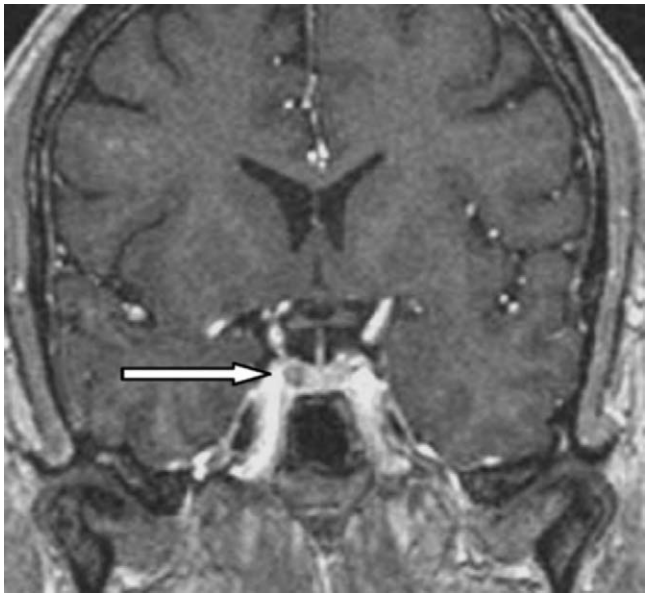

Fig. 2. Coronal enhanced T1-weighted image of a microadenoma in a 39-year-old woman with hyperprolactenaemia. The lesion (arrow) is non-enhancing and well delineated.

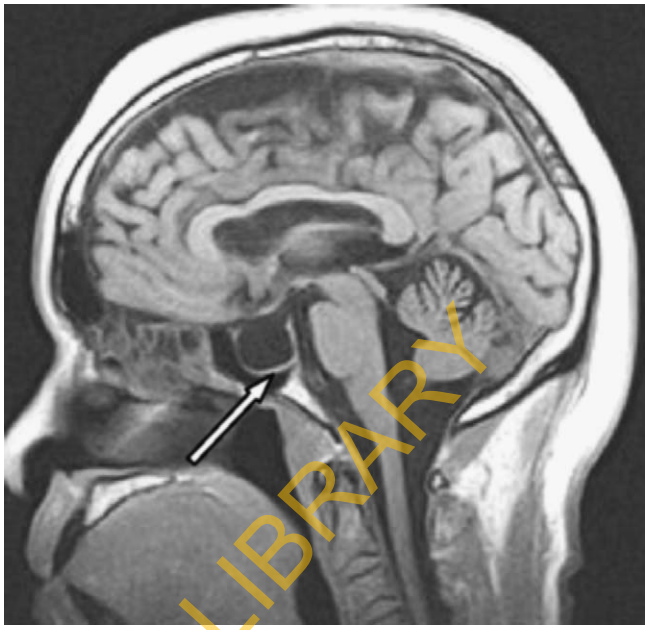

Fig. 3. Sagittal enhanced T1 weighted MR image of a Rathke's cleft cyst in a 58-year-old man. The cyst is non-enhancing and fills the entire ballooned sella turcica (arrow).

Table 3
Four cases of radiology/pathology diagnostic disparity in patients with sellar and parasellar lesions.

	Diagnosis	
	Radiology	Pathology
1	Pituitary macroadenoma	Craniopharyngioma
2	Glioma	Ependymoma
3	Pituitary macroadenoma	Meningioma
4	Glioma	Anaplastic astrocytoma

Table 4
Distribution of location and mass effect of sellar and parasellar tumours.

Location	Percentage	COW/cavernous sinus displacement
Sellar	40 (64.52%)	11 (27.50%)
Parasellar	11 (17.74%)	2 (18.18%)
Suprasellar	10 (16.12%)	7 (70%)
Infrasellar	1 (1.61%)	0 (0%)

COW = circle of Willis.

Of the 24 (38.7%) cases with histopathological diagnosis, 20 (83.3%) were consistent with initial radiological diagnosis. Table 3 shows cases of radiology/pathology differences. The distribution of the lesions based on location and effect on the circle of Willis or cavernous sinus is shown in Table 4.

MRI demonstrated sellar masses with diffuse enlargement of the pituitary, suprasellar extension cavernous sinus extension and displacement of the circle of Willis (Fig. 4).

In 20 patients, MRI showed tumour significantly displacing the vessels of the circle of Willis or the cavernous sinus (Fig. 5). One patient had bilateral internal carotid artery giant aneurysms with associated mural thromboses (Fig. 6).

All lesions were satisfactorily characterised with T1-weighted contrast enhancement as this provides fine anatomic detail and accurate tumour definition. Both microadenomas and meningiomas were more conspicuous immediately after contrast injection. Macroadenomas and meningiomas were isointense relative to gray matter on T1 images but showed remarkable post gadolinium enhancements.

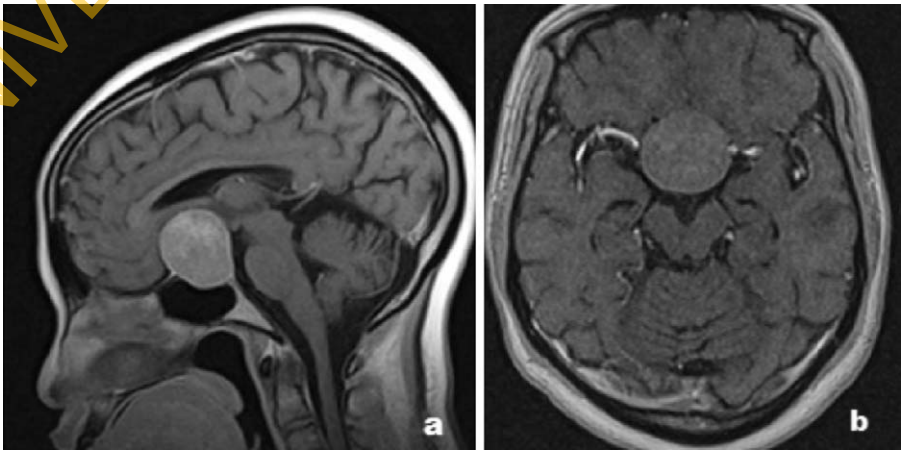

Fig. 4. Macroadenoma in a 42-year-old woman. Sagittal (a) and axial (b) post-gadolinium images, showing moderately enhancing pituitary adenoma expanding the sellar with supra-sellar extension.

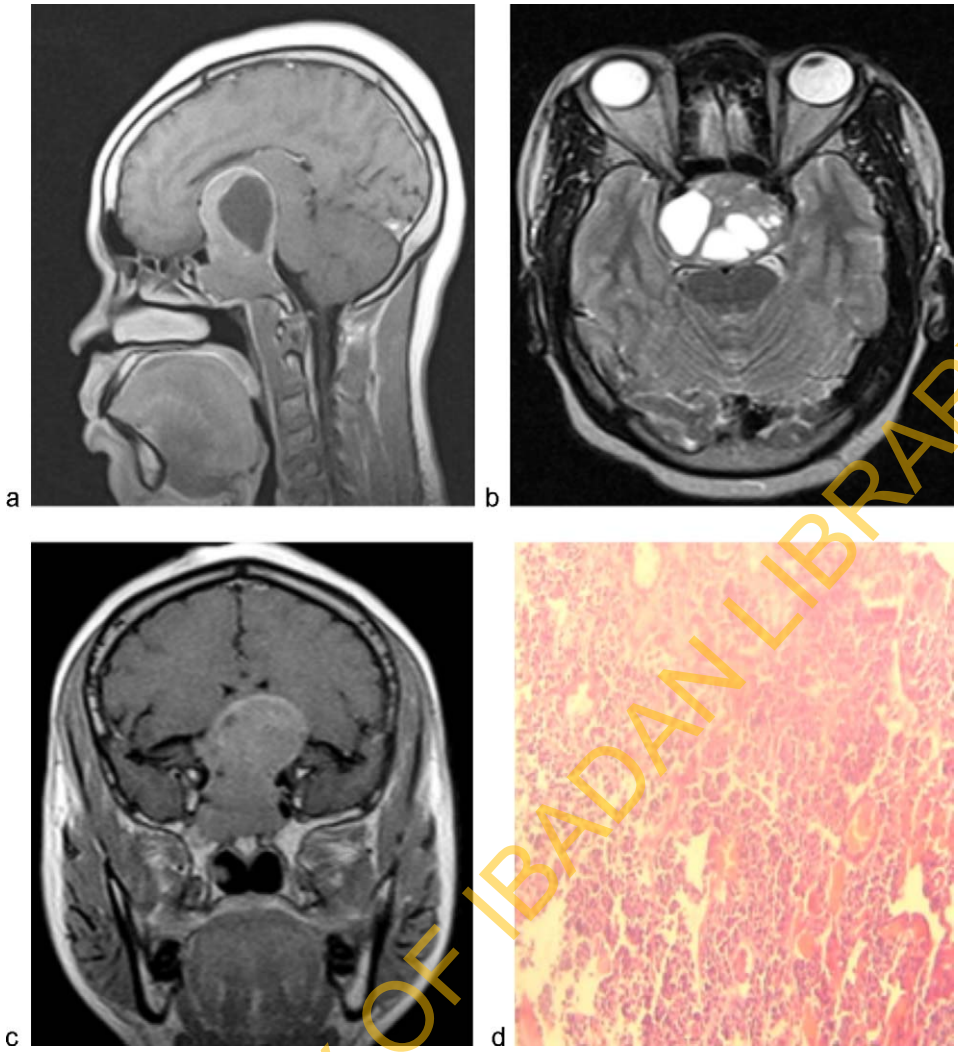

Fig. 5. (a) Sagittal enhanced T1 weighted image of a solidly enhancing huge adenoma. The mass extends into the suprasellar region and is inseparable from the hypothalamus and chiasm. (b) Axial T2W image showing the multiple cystic areas which are of low T1 and high T2 signals within the mass. (c) Coronal enhanced T1 weighted image showing extent and effect on the cavernous sinuses. (d). Photomicrograph (original magnification 16×; H&E stain) of a pituitary adenoma showing clusters of bland appearing epithelial cells with uniform nuclei and moderate cytoplasm that are divided by a net work of capillary channels within loose fibrous strands.

4. Discussion

Although most sellar lesions are due to pituitary adenomas, a number of other pathologies involving the parasellar region can present in a similar manner. The diagnosis of such lesions requires careful clinical, imaging, and finally histological evaluation.

The area immediately around the pituitary is an anatomically complex area that represents crucial cross-roads for important adjacent structures [2]. While the sellar region has specific anatomical landmarks, the parasellar region is not clearly delineated and includes all the structures that surround the sella turcica [5]. Vital structures such as the brain parenchyma, meninges, visual pathways and other cranial nerves, major blood vessels, and bony compartments are involved. A diversity of clinical symptoms and signs can develop from the lesions that occupy the sellar and parasellar area due to the location, size and growth potential of lesions, and the subsequent damage to specific adjacent vital structures [6].

Pituitary adenomas are recognised as the most common cause of a sellar mass, occasionally extending to the parasellar region [6]. However, in approximately 9% of cases, aetiology other than a pituitary adenoma is encountered [7]. A number of non-neoplastic lesions, such as inflammatory, granulomatous, infectious and/or vascular pathologies can also inhabit this area. In this paper we primarily attempt an overview of our experiences with using a low-field MR system in a less developed region of Africa.

Institutions in Nigeria with limited resources and fewer people having access to MRI technology have tended to select low-field conventional MR systems for use in their teaching hospitals.

Open low-field strength MRI systems present a lower cost option for centres in developing countries that may not have a large caseload [8] and may be extremely beneficial to a subset of patients.

When compared with high-field closed MRI systems for imaging, a prospective study found no statistically relevant difference in high-field MRI diagnosis compared to low-field MRI diagnostic accuracy measured by clinical or surgical gold standard in three of four regions examined; in cerebral examinations there was a small yet significant advantage for the high-field systems ($p = 0.01$) [9]. However the authors suggest that limitations due to field strength are relevant only in a small number of cases, where minute morphological changes in the brain and spine are best examined with a high-field unit. Nonetheless the cases in our series suggest that patient in developing countries usually present late at a time when morphological changes are huge or clinically obvious. Such changes would be less difficult to identify in a low-field system.

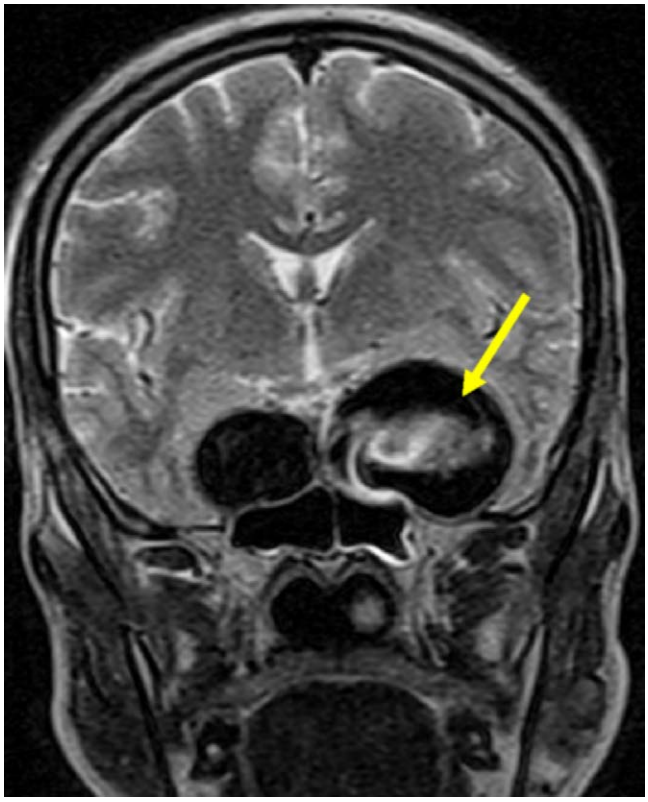

Fig. 6. MRI of a 22-year-old female with bilateral giant aneurysms of the internal carotid arteries. She presented with gradual visual loss. Coronal T2W image shows bilateral huge parasellar signal void masses. The left mass shows a central hyperintense area within the mass consistent with a mural thrombus (arrow).

Other benefits of a low field system in this setting include the use by large patients, and to those who suffer from claustrophobia. They are also useful in guiding interventional procedures. It has been suggested that the use of open scanners will reduce the need for sedation and anaesthesia for children undergoing MRI [8].

It is evident that high-field MRI produces better image quality with fewer motion artefacts than the open low-field MRI, but a study has shown that diagnostic accuracy in the cases with surgical correlation was the same for both systems [10].

The study suggests that low-field MRI compares favourably to high-field MRI but has disadvantages of longer duration of examination, and increased risk of reduced image quality due to motion artefacts [10].

As with all MRI systems, there are potential hazards from the interaction of the magnetic field with ferromagnetic objects in the patient or in the examination room. The risks are smaller with low-field strength scanners than with higher field strength systems [8].

The clinical presentation of sellar/parasellar lesions can be similar even though being affected by a wide variety of tumours. While symptoms of mass effect, visual field deficits and endocrine abnormalities are not sufficient to distinguish these tumours, the use low field MR can help in reaching the proper diagnosis in developing countries. Non-pituitary adenomatous parasellar lesions do not usually present with hypersecretory syndromes but rather with hypopituitarism or symptoms of mass effect due to compression of nearby vital surrounding structures, the severity of which depends on the location, size and growth potential of the tumours [11,12].

Visual loss and other neuro-ophthalmic complications are often common presenting complaints due to the proximity of sellar tumours to the optic nerves, chiasm and optic tracts and their corresponding mass effect on these structures [3]. The patients in this study had an average of 37.8 months of symptoms of visual impairment before presentation and majority showed abnormalities of the pupil, optic atrophy and abnormalities of the visual fields at the time of presentation. It would appear that Nigerian patients with visual symptoms indicative of a sellar or parasellar tumour; do not often present early enough, for timely intervention to be started which may restore their vision.

Direct optic nerve, chiasm or tract compression results in characteristic visual field defects which may cause the patients to present first to an ophthalmologist. An expanding sellar mass may also manifest indirectly as raised intracranial pressure. In addition, chronic raised intracranial pressure may cause secondary damage to the optic nerve and irreversible visual loss.

The visual symptoms may or may not be accompanied by a history of headache. The severity of visual loss depends on the site, size and rate of growth of the tumour [13]. Non-secretory tumours are more likely to present with visual symptoms as they tend to grow large and cause mass effect. Radiological imaging is invaluable in evaluating the extent and differential diagnoses of sellar and parasellar tumours. It has been suggested that abnormal signal intensity of the optic nerves seen on T2 weighted MR imaging may be correlated with visual impairment and disease duration [13]. T2 signal hyperintensity observed on the ventral surface of the optic chiasm is thought to represent optic chiasm compression by the tumour and associated anoxic neuronal damage. The abnormal signal intensity correlates with the degree of optic nerve compression and visual impairment, while the post operative visual recovery depends on the disease duration. We did not attempt to correlate the tumour size with abnormal optic nerve signal intensity due to our small sample size. Post-operative visual recovery following surgical resection of pituitary tumours occurs in stages [14]. Rapid recovery occurs in the initial phase; within days of surgical decompression to the end of the first week, during which visual fields may return to normal in some patients. While a slower but similarly marked improvement occurs over the next four months. Finally, only less marked improvement occurs after the first six months [13,14]. This pattern of recovery is similar to what we observed in our series.

In patients with parasellar lesions, headache develops either as a consequence of increased intracranial pressure, distortion of the diaphragma, or irritation of the parasellar dura [6]. As parasellar tumours commonly originate or infiltrate structures within close proximity to the cranial nerves traversing through the cavernous sinus (Fig. 7), cranial nerve abnormalities develop in approximately 25% of cases [15]. Involvement of the hypothalamus and pituitary leads to complete or partial pituitary hormonal deficiencies; hyperprolactinaemia may also develop secondary to stalk compression [12]. Diabetes insipidus (DI) is a common finding in parasellar tumours [6] and usually indicates that the lesion is unlikely to be a pituitary adenoma; however, in our series no patient presented with features of DI. This may be due to the selected sample or the possibility that the history of DI was not elicited at the time of reporting.

In the review by Liu et al. systemic symptoms, such as fever of unknown origin, were the presenting symptoms in 22% of patients, whereas the commonest presenting compressive symptoms were headache (56%), diplopia (39%) and visual field defects (28%) respectively [16]. These values and symptoms except for fever are similar to the clinical findings in our patients.

Radiological imaging of the sellar and parasellar region is challenging since the sella is a small volume region in close proximity to many complex structures [2]. Both CT and MRI play vital roles in the anatomical delineation of lesions in this area [17]. MRI is the modality of choice as it provides high contrast multiplanar images, whereas CT has a complementary role in delineating bony architecture demonstrating calcifications [5]. Conventional radiology is outdated and no longer in use in most parts of the world as the sole

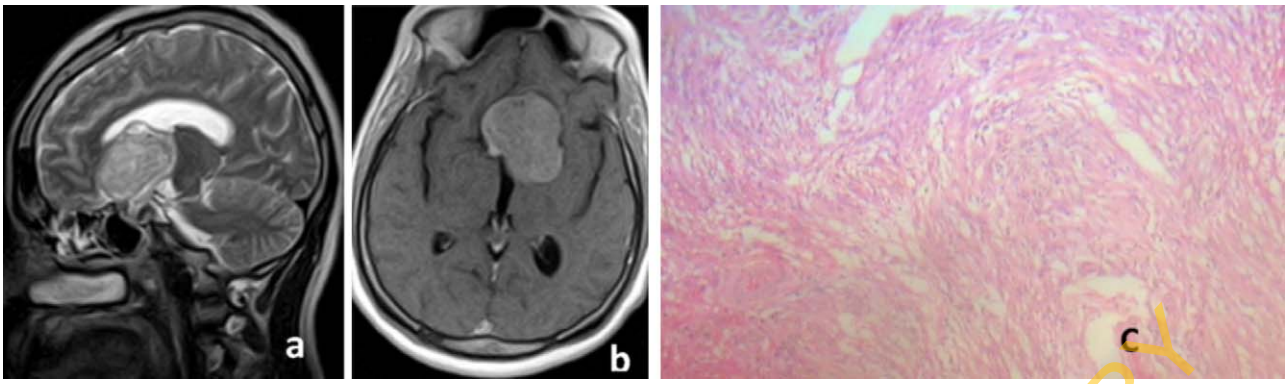

Fig. 7. Sagittal T2 (a) and enhanced axial T1. (b) MR images of a suprasellar meningioma. The mass lies above the pituitary (which is normal) involves the chiasm and enhances avidly. Photomicrograph (c) (original magnification 40×; H&E stain) of the meningioma composed of oval to spindle shaped cells with indistinct cytoplasmic borders disposed in whorled pattern. The nuclei are round to oval and bland with no psammoma bodies.

modality of imaging; however it is still greatly used by physicians at our centre as the initial tool in the management of patients with suspected sellar or parasellar abnormality. Even digital subtraction angiography has been largely replaced by MR and CT angiography in developed parts of the world [5].

Although the radiological features of parasellar tumours have many similarities, some may have distinctive findings [1,6,18]. However, the differential diagnosis among the various types of tumours remains difficult using conventional morphological imaging. Also the use of image-guided biopsy techniques in diagnosis can be time-consuming and may damage surrounding critical neurovascular structures in some patients [19,20]. At our centre none of these techniques have been attempted due to the limitation of facilities more so due to the fact that the potential of morbidity and mortality of such procedures is high .In addition the expected benefit from obtaining the correct diagnosis may be doubtful.

Our experience has shown a good correlation between radiological and histopathological diagnosis. This suggests that a good understanding of the MR and other imaging features can reasonably be relied upon in narrowing the differential diagnosis of this complex region.

Even though endocrine abnormalities are relatively common among sellar and parasellar lesions [16,21] our series did not also reflect this. This is also not surprising as our evaluation is based on a single hospital using an essentially new and expensive investigative tool in an economically deprived society [22]. More so where treatment costs are borne solely by out of pocket payments.

The differential diagnosis of parasellar lesions can be truly extensive [22,23] nonetheless we would endeavour to discuss the few we have recorded in our hospital.

Our series revealed pituitary adenomas to be more than half of all the pituitary tumours (66.7%). It is possible that being a retrospective analysis of data with its inherent limitations, consisting mainly of referred patients for MRI at our hospital, there may be a slight bias towards non functioning pituitary tumours (NFPTs). It is also probable that subjects with prolactinomas and other endocrine dysfunctions could have been managed clinically by a gynaecologist and/or endocrinologist without the use of MRI for initial evaluation as a cost saving measure as is usual in our environment.

Microadenomas are usually too small to create significant symptoms of mass effect, but may become clinically evident due to signs and symptoms of hormonal excess. Microadenomas are commonly hypointense relative to the normal pituitary gland on T1-weighted images but occasionally are isointense on unenhanced images. The appearance of microadenomas on T2-weighted images is variable [24]. Because they are generally hypovascular compared to the richly vascular pituitary gland and adjacent cavernous sinuses, they are also almost always more conspicuous immediately following gadolinium enhancement [25,26]. At some point after the administration of contrast material, the adenoma enhancement characteristics may overlap with the pituitary gland making the lesion inconspicuous. Lesions that are isointense on initial images may be clearly visualized only after contrast material administration [27]. Our low field MR system was able to demonstrate 2 cases of microadenoma only after the contrast injection, a similar characteristic with high field units. Dwyer et al. [25] had shown that secondary signs of microadenomas such as lateral deviation of the infundibulum and focal upward convexity of the pituitary gland could act as a useful guide. Dynamic studies are helpful in further defining the lesions due to the differential enhancement pattern of tumoural versus non-tumoural parenchyma which is a function of time.

The commonest tumours of the sellar region after pituitary adenomas are meningiomas representing 10–15% of cases. They may rarely occur entirely within the sella mimicking a pituitary adenoma [28,29].

Meningiomas are generally isointense relative to cortical gray matter on T1 and T2-weighted images (75% in our series) (Fig. 7) [30]. Contrast enhancement of meningiomas is usually markedly brilliant owing to their highly vascular nature (Fig. 8). This commonly uniform enhancement pattern was established in all our cases. In contrast to other parasellar tumours, meningiomas encase blood vessels and tend to narrow the lumen [31]. This was a recognisable feature in our series (Fig. 8).

The craniopharyngiomas are much less common than meningiomas. They are benign, slow-growing epithelial neoplasms from squamous epithelial rests of the Rathke pouch. Greater than 90% show a suprasellar component, and may extend into the anterior, middle or posterior fossa [32]. The presenting manifestations among children and adults are usually not different [33]. However chronic headache has been reported as the most common presenting complaint in adults [4]. Large craniopharyngiomas may cause visual disturbance, interruption of cerebrospinal fluid flow, and hypothalamic-hypophyseal axis dysfunction (Fig. 9). The histopathology features of craniopharyngiomas are quite variable, and this is reflected in their imaging characteristics; they are the most heterogeneous of all sellar and suprasellar lesions encountered in MR imaging [34] (Fig. 9). They often have both cystic and solid components. The cystic moiety may have high cholesterol content or contain haemorrhage, both of which may produce high T1 signal [35]. Solid components more typically produce a moderate T1 signal and high T2 signal. Two of the craniopharyngiomas we imaged showed more or less even amounts of high and low signals on T1-weighted images; the remainder showed predominantly low T1 signal. MR imaging has an important role in the evaluation of the extent of the lesions for preoperative planning and in detection of

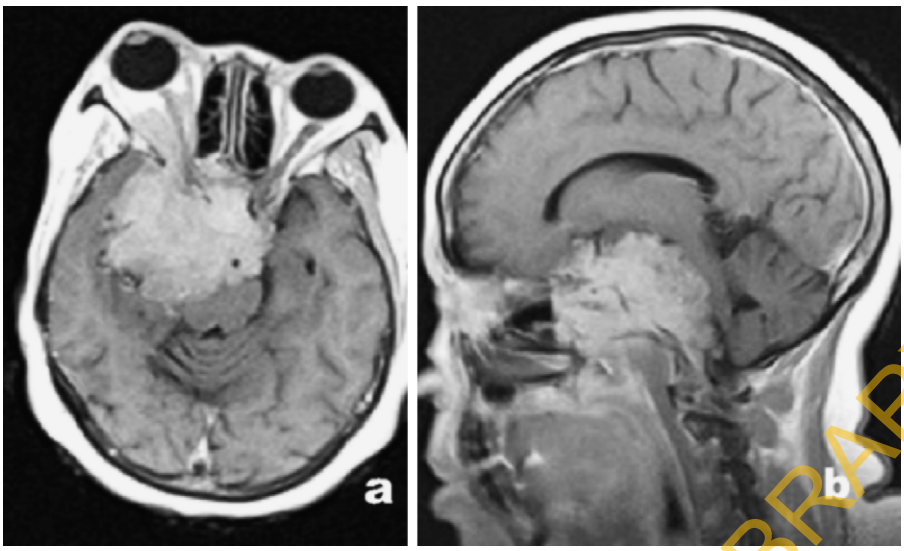

Fig. 8. 60-Year-old woman with histologically proven meningioma. Axial (a) and sagittal (b) T1W post contrast images show extensive invasion of cavernous sinus, optic nerve, chiasm and other parasellar structures.

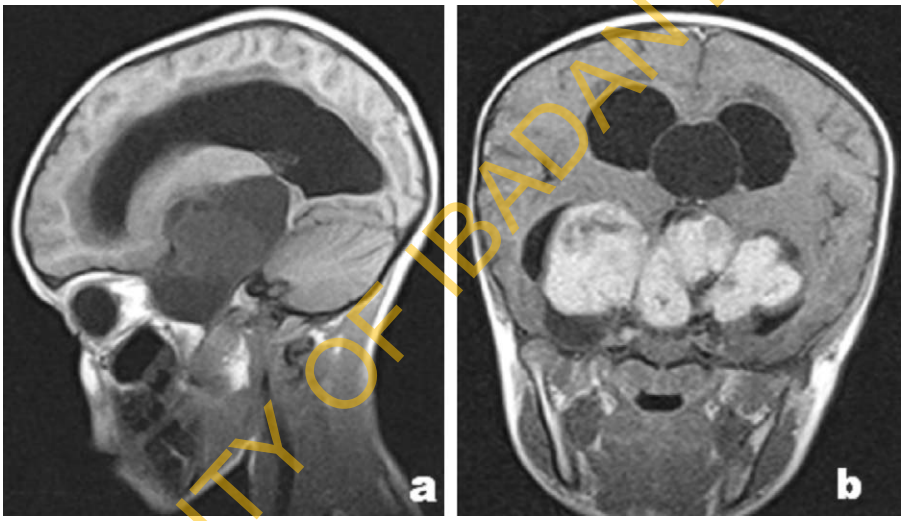

Fig. 9. 4-Year-old boy with histologically proven craniopharyngioma. (a) Sagittal T1W and (b) axial T1W post contrast images show a huge lobulated and amorphous suprasellar mass with associated obstructive hydrocephalus.

tumour recurrence [34,35]. CT provides superior demonstration of tumoural calcification and, hence, may permit a more specific diagnosis when this common characteristic is demonstrated. This is a circumstance in which CT assumes a particularly useful role as a diagnostic adjunct.

Rathke's cleft cysts are also less common and arise from remnants of squamous epithelium of Rathke's pouch and consist of a single layer of epithelial cells with mucoid, cellular or serous components in the cyst fluid [6]. Although the majority have a major intrasellar component, about a third can extend into the parasellar region; occasionally they can be entirely suprasellar [6,36]. Many of these are small and asymptomatic, but they may become symptomatic due to compressive symptoms and pituitary hormonal deficiencies, when DI may develop in up to 20% [36]. They are distinguished from craniopharyngiomas histologically by having walls composed of columnar or cuboidal epithelium [28]. Although no specific radiological features have been identified, Rathke's cysts appear as discrete cystic and non-enhancing lesions on MRI with variable signal intensity on either T1 or T2-weighted images; these lesions need to be differentiated from craniopharyngiomas and arachnoid cysts [6,36] The cases in our series were completely intrasellar showing low and high signal intensity on T1W and T2W images respectively (Fig. 3).

Tumours of astrocytic origin and metastases to the sellar and parasellar regions arising are not very common [37] a finding corroborated by our study.

Parasellar metastases are commonly from lung and breast cancer in men and women respectively. Although a history of carcinoma is suggestive of the diagnosis of metastatic disease, the neural deficits frequently lead to initial presentation [21,37]. The one patient with metastasis in this series had thyroid carcinoma and presented with visual deficits, headaches and paraplegia. MR images showed huge nodular enhancing isointense parasellar masses extending along the dura of the right occipital lobe.

5. Conclusion

The sellar and parasellar regions can be affected by a wide variety of lesions. The presentation of these lesions could be similar. While symptoms of mass effect, visual field deficits and endocrine abnormalities are not sufficient to distinguish these lesions, the use low field MR does help in reaching the proper diagnosis in countries

of low economic resource. Although only few centres have access to this important modality for neuroimaging, the impact of more affordable MR equipment on large populations with formerly no access to modern imaging techniques could be particularly beneficial.

Conflicts of interest

The authors or the authors' institutions have no conflicts of interest.

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