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Case Series

Magnetic Resonance Imaging of Pituitary Microadenoma: A Case Series

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ABSTRACT

Pituitary microadenoma is a benign tumour of the pituitary gland less than 10mm in diameter. Pituitary microadenoma pose a challenge in clinical practice as well as diagnostic imaging due to their silent clinical presentation and size. Magnetic Resonance Imaging (MRI) is the mainstay for the diagnosis of pituitary microadenoma. In developing countries, there is scarcity of Medical Specialist and more so, functional MRI machines are not readily available. Even where available, they are not affordable for the majority of the populace. These factors might be responsible for the delay and under reporting of pituitary microadenoma in developing countries. We presented two cases of microadenoma who have visited different health facilities with different symptomatology as well as the challenges encountered in their diagnosis.

KEYWORDS: Magnetic Resonance Imaging, Pituitary Microadenoma, Hyperprolactinemia, Microprolactinoma

INTRODUCTION

Pituitary adenoma is the most common pituitary tumour and accounts for about 10% of all intracranial tumours.[1] Pituitary adenoma is a benign well-defined encapsulated epithelial neoplasm arising from the adenohypophysis.[2,3] The prevalence of pituitary adenoma varies between populations. Studies in Europe and USA showed a prevalence of 5-20% based on registry figures,[4,5] while studies done in Nigeria reported a prevalence of 16.8-21%.[6,7] Pituitary adenomas are commoner in females of child bearing age and the incidence increases with age, with its peak at 3rd-6th decade.[8,9]

Pituitary adenomas are classified into micro and microadenoma depending on their size. Pituitary adenoma less than 10mm in diameter is termed microadenoma, while the macro-adenomas are greater than 10mm in diameter. The pituitary microadenoma accounts for about half of all the pituitary adenomas.[10]

The pituitary adenomas are also classified as functional or non-functional based on their hormonal activity. Functional pituitary adenomas present with hypersecretory syndrome of the respective excess hormone they produce and as such they can be clinically classified by type of hormone they produce. The non-functional pituitary adenoma may present with features of mass effect or if small may be asymptomatic hence are usually detected as incidental finding while imaging the brain for other symptoms and are termed incidentaloma.

Pituitary microadenomas are usually confined to the sella and produce no pressure effect and thus no pressure symptoms. Functioning microadenoma may present with symptoms of hormonal imbalance. Hyperprolactinomas for instance may present with amenorrhoea and galactorrhea; growth hormone functioning microadenoma may present with gigantism in children and acromegaly in adults;while adrenocorticotrophic hormone (ACTH) secreting pituitary microadenoma may present with weight gain, easy bruising of the skin and muscle weakness.

Magnetic resonance imaging (MRI) is the main stay in imaging for pituitary microadenoma. The MRI has high sensitivity and specificity (about 90%) in the diagnosis of functional pituitary microadenoma.[5] The

multi planar capability, thin slices, dynamic contrast imaging and absence of beam hardening improve MRI sensitivity.[5]

This report presents two cases of pituitary microadenoma in women of reproductive age. Both patients have undergone different investigations and treatment from different hospitals with no avail of symptoms. The role of MRI for the diagnosis of pituitary microadenoma has been highlighted.

CASE 1

SM is a 31-year-old female health caregiver referred from Gynaecology clinic to Radiology Department for brain MRI on account of a two-week history of headache and blurring of vision and a one-month history of galactorrhea with a clinical diagnosis of suspected intra-cranial space occupying lesion. Patient had recurrent headache in the past and had been managed for recurrent head ache in various hospitals. There was no history of vomiting or diplopia. She had 3 children; her last child birth was three years earlier to presentation. There was no history to suggest other anterior pituitary hormone hyper secretion.

Physical examination was within normal limits. Her visual field examination by confrontational test was apparently normal. Visual acuity was 22/20 in both eyes. Fundoscopic examination demonstrated normal optic disc.

Breast examination revealed bilateral well-developed breast for her age with no tenderness or palpable mass. However, milk was expressed on gentle pressure.

Hormonal profile revealed hyperprolactinemia with serum prolactin level of 450ng/dl (normal value is 5-40ng/dl).

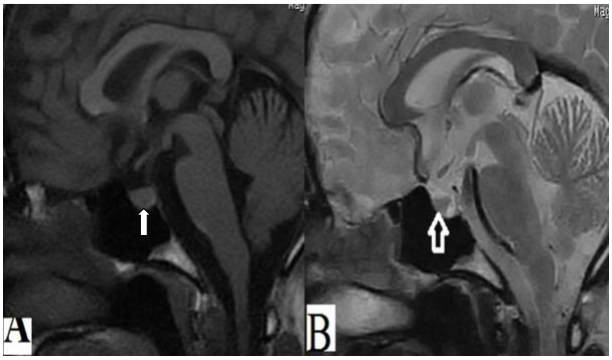

Figure1:T1WI(A) and T2WI(B) MRI mid-sagittal sections showing a well-defined sub centimetre lesion within the pituitary gland (arrow) which is isointense on T1W and hypointense on T2W (arrow) images

Anteroposterior and lateral skull radiographs demonstrated normal skull vault, sella and sutures.

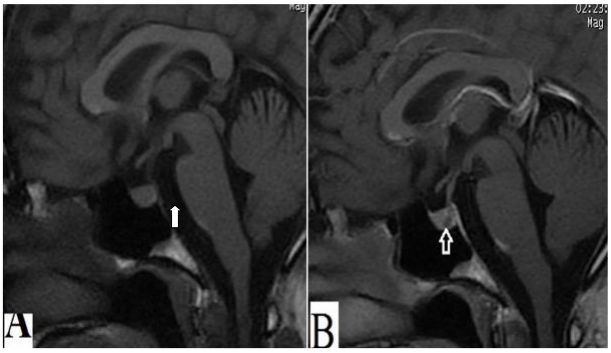

Figure 2: Sagittal T1W MRI(A) and Post contrast mid sagittal section (B) demonstrating an oval shaped non-enhancing isointense lesion in the pituitary gland (white arrows)

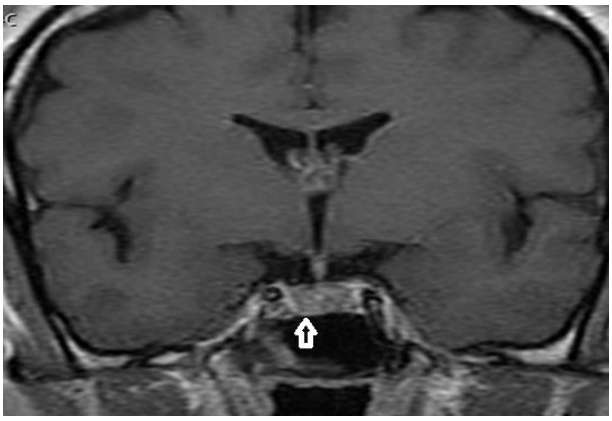

Figure 3: T1WI post contrast coronal MRI image at the level of the pituitary showing subtle focal enlargement of the pituitary gland on the right side with inferior bulge (white arrow) of the floor of the pituitary fossa.

Magnetic Resonance Imaging mid sagittal section (Figure 1) revealed a well-defined subcentimeter lesion within the anterior lobe of the pituitary gland and measured 8mm × 6 mm. It was isointense on T1W and hypointense on T2W images with no enhancement post contrast (Figure 2). The coronal post-contrast image however showed subtle focal enlargement of the pituitary gland on the right side with an inferior bulge of the floor of the pituitary fossa (Figure 3).

A diagnosis of functioning pituitary microadenoma was made based on the clinical features, laboratory investigations and MRI findings. Patient was subsequently placed on bromocriptine tablets by the endocrinologists with remarkable resolution of her clinical symptoms and normalisation of the laboratory findings. Patient was also on regular follow up with no complains**.**

CASE 2

FA is a 32-year-old female who presented to the outpatient department on account of blurring of vision of

1 year and inability to conceive with galactorrhea for about 17 years. No history of headache, vomiting or diplopia. There was no history suggestive of thyroid or growth hormone dysfunction. She has been managed for primary infertility at different facilities and even had a single attempt of an in-vitrofertilization without success. Physical examination was within normal limits. Her visual field examination by confrontational test was apparently normal. Visual acuity was 22/20 in both eyes. Fundoscopic examination demonstrated normal optic nerves bilaterally with no evidence of papillo oedema and there was no neurological deficit.

Breast examination revealed bilateral well-developed breast for her age. The breast was non tender with no palpable mass. However**,** milk was expressed on gentle pressure. Hormonal profile revealed hyperprolactinemia.

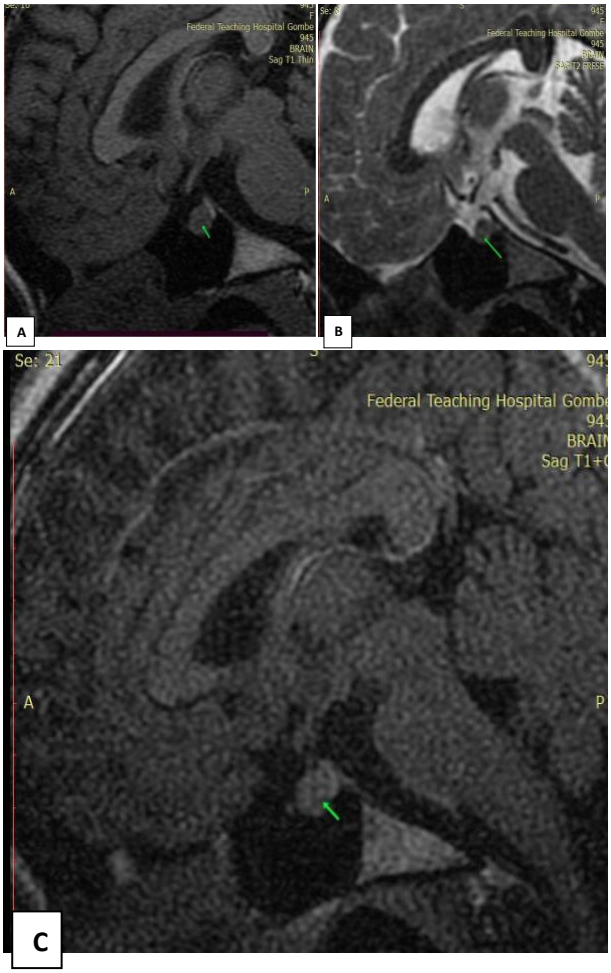

Figure 4: T1W(A), T2W(B) andT1W Post contrast (C) MRI mid sagittal sections showing a micro nodule noted within the pituitary gland (white arrow) It is hypointense on T1W images and isointense on T2W images and show mild enhancement post contrast with associated inferior bulge.

Magnetic Resonance Imaging revealed a micro nodule noted within the pituitary gland measuring 3.3mm x 3.7mm. It demonstrates hypointense signal intensity on T1W images and isointensity on T2W images. Mild enhancement is noted on post contrast image with associated inferior bulge also noted (Figure 4). Axial and coronal images skipped the micro nodule due to thicker slice interval.

A diagnosis of functioning pituitary microadenoma was made based on the clinical features, laboratory investigations and MRI findings. Patient was subsequently managed medically and responding well to treatment.

DISCUSSION

Pituitary adenoma is the most common pituitary tumour and accounts for about 10% of intra cranial tumours. It is commoner in female but can be seen in all ages.[11] There is increase in prevalence with increase in age and is commoner in female of child bearing age.[8,9]

Pituitary microadenomas can also be classified as functional microadenoma when the tumour cells produce hormones and non-functional when tumour cells do not produce hormones. The non-functioning pituitary microadenomas are symptomless commonly diagnosed following imaging of the brain on account of different neurological problem. On the other hand, functioning pituitary microadenomas presents with symptoms due to hormonal hyper-secretion.

The cases presented were young females of child bearing age, both cases presented with galactorrhoea, headache and blurring of vision. The galactorrhoea suggests the presence of prolactin producing pituitary adenoma while the headache and the blurring of vision may suggest increased intra cranial pressure. The blurring of vision might also be due to mild compression of vessels supplying the optic chiasma from focal enlargement or bulging of the pituitary gland.[12] Hormonal profile of the patients revealed hyperprolactinemia.

The differential diagnoses of pituitary microadenoma includes; normal pituitary gland due to differential enhancement, Rathke's cleft cyst, craniopharyngioma rarely purely intrasellar, pituitary metastasis and pituitary apoplexy.

Lateral skull radiographs are usually non-specific. However, cone down views of the sella may reveal focal bulging of the sella floor, erosion of the clinoid process and floor of the sella, intra-sella calcification and double floor sella. High resolution CT scan can be used when MRI is not available. CT scan is good in demonstrating subtle bony erosion and surgically relevant bony anatomy. However, CT-Scan does not provide excellent soft tissue resolution as MRI and also

the soft tissue contrast is distorted by the undesirable beam hardening artefacts.

MRI is the imaging modality of choice for evaluation of pituitary microadenoma due its multi planar capability, better soft tissue resolution and the dynamic contrast imaging.[13] The MRI findings (as seen in these patients) includes; a well-defined subcentimeter lesion within the pituitary gland. (Note the signal intensities on both T1W T2W sequences) The lesion was seen to be hypo-enhancing on post IV contrast images. The post contrast image showed subtle focal enlargement of the pituitary gland with inferior bulge of the floor of the pituitary gland. It is important to note that, these findings were subtle and can be missed especially when the clinical features are inadequate. High index of suspicion with a diligent review of the images is required to identify these findings.

The management of choice for microprolactinoma is medical treatment. The most effective drugs used are bromocriptine and cabergoline. The patients presented had good clinical response on bromocriptine with gradual resolution of their symptoms and normalisation of their biochemical findings

CONCLUSION

We presented two cases of pituitary microadenomas. In these cases, appropriate diagnosis and management were delayed due to the inadequacy of Medical Specialist and non-availability of functional MRI machine in our environment. These might suggest that pituitary microadenomas are highly under reported in our environment.

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