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Spontaneous regression for pituitary macroadenoma: a myth or reality?

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Abstract— Background: Controversy exist as regards the optimum treatment of pituitary adenoma as it is claimed to be spontaneously regressed. The aim of the current case report with literature review is to highlight the reality of the notion that pituitary adenomas might need no treatment nor surgical intervention due to their spontaneous regression. **Methods:** We presented here with a case of a 47-year-old female who undergone a strict observation and follow up for pituitary adenoma during a period of 10 years. Review of the literature took place as regards this notion. **Conclusion:** Pituitary adenomas may need no intervention because they may regress spontaneously. Although the data of one patient is limited it may shed the light on the problem. Further cohort series of this rare condition might be needed to properly investigate the condition.

Keywords: Pituitary adenoma, clinical presentation, spontaneous regression.

1. Introduction

Non-functioning pituitary adenomas (NFPAs) are benign pituitary neoplasms that arise from the adenohypophyseal cells. Usually, they present with no clinical nor biochemical evidence of hormonal excess except for a mild hyperprolactinaemia in some cases. They account for 14–54% of pituitary adenomas. (1) Most of NFPAs presentations are pressure symptoms caused by the mass effect on adjacent structures. They may also induce visual acuity or visual field symptoms by compressing either optic tracts or chiasm. When a significant suprasellar extension into the third ventricle it will induce hydrocephalus with headache, nausea or vomiting to be the most warning presentations. (2) Spontaneous regression is uncommon. This may be attributed to the fact that either apoplexy or autoimmune may exist. However, it might tremendously increase in seize necessitating prompt surgical intervention. The current study reports a patient with spontaneous regression during a long term follow up.

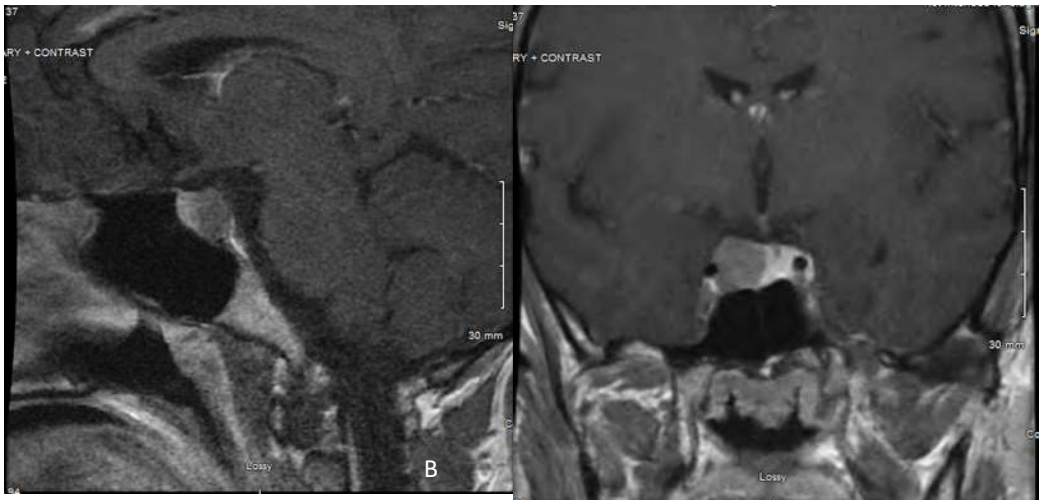
2. Case presentation

A 47- year-old femalewho is known case of Diabetes Mellitus type 2. She also suffers of depression and bipolar disorders. She is undergoing medications for these problems. The patient also suffers of other medical comorbidities including bronchial asthma, polyarthritis. She presented with occasional attacks of headache. She underwent Computer Tomography (CT) with the anticipated diagnosis of sinus infection to be the reason for her symptoms. CT findings proved the presence of sellar and suprasellar lesion. Magnetic resonance imaging of the brain (MRI) and Sella showed enhancing right sided sellar and suprasellar lesions that were encasing the right cavernous internal carotid artery (ICA) (Figure 1). The initially done images were obtained on April, 2012 when the lesion measures 1.7 x 1.2 x 1.4 cm in transverse, craniocaudal and anteroposterior (AP) dimensions respectively. Her hormonal profile was within normal (Table 1.)

No ophthalmological abnormalities were detected. She had to be followed up by an Endocrinology team as an initial care. Yet, she moved to another city and was lost for follow up. She showed up again after COVID 19 pandemic when she started to resume the follow up again. Her laboratory results revealed the following data: (Table.1) TSH=0.45, FT3 4.8 and FT4 17. A.M. cortisol 327, ACTH 4.5, free Testosterone <20, FSH 5, LH 2.5 and prolactin 12.
MRI was repeated during May 2020, it showed the tumor measurement to be 1.2 x 1.0 x 0.9 cm in transverse, craniocaudal and AP dimensions, respectively. Her follow up MRI showed no significant change in size. Meanwhile, she remained asymptomatic without any given treatment. She was referred to Neurosurgery team for discussion with the patient as regards performing a surgical intervention. As well as follow up prospectively. During her follow up, she underwent an MRI pituitary assessment in April 2021. This showed further decrease in size, that it becomes measuring 1.0 x 0.8 x 0.8 cm in transverse, craniocaudal and AP dimensions, respectively. This regression of diameter took place although she received no medications. Moreover, she reported no worsening of her vision or any additive symptoms during the follow up period. Her hormonal profile as well, remained within normal limits.

Table 1. Pituitary hormones levels

Date (Year)	2020	2021	Reference
TSH	0.45	1.09	0.35-5 mIU/L
FT3	4.8	4.1	3.4-5.9 pmol/L
FT4	1.7	18	12-22 pmol/L
Cortisol	327	554	130-540
ACTH	4.5	8.2	<10 Pmol/L
Testosterone	<20	<20	15 to 70 ng/dL
FSH	5	5	0.5-15IU/L
LH	2.5	9.6	0.5-15IU/L
Prolactin	12	11	<24 ug/L



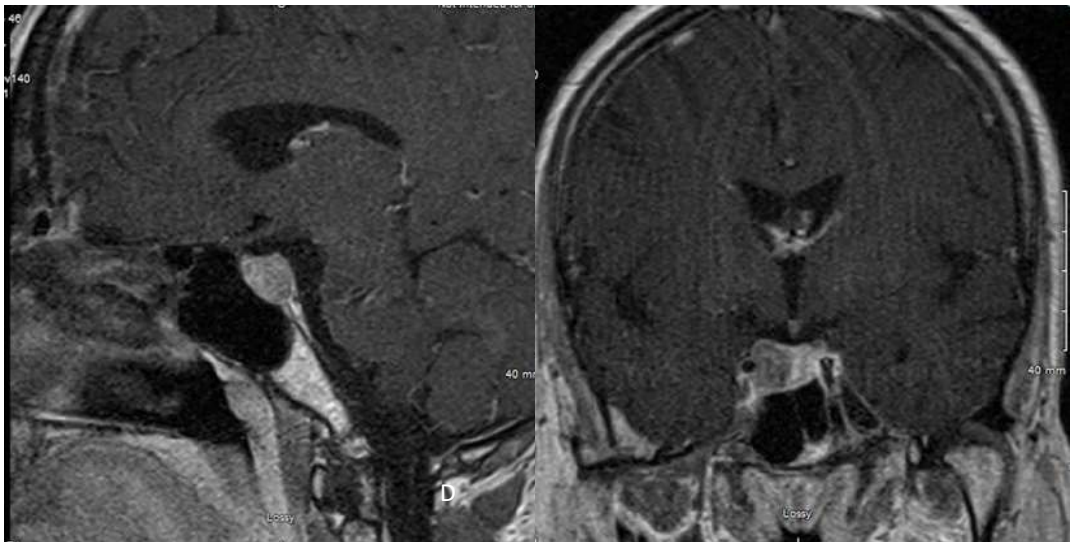


Fig.1 Postgadolinium T1-weighted MR images in the sagittal (*left panels*) and coronal (*right panels*) planes. **A and B:** Images from 2012, demonstrating a pituitary macroadenoma with suprasellar extensionand abutting right ICA. **C and D:** In 2021,the macroadenoma has significantly reduced in size, with decrease in suprasellar component.

3. **Discussion:**

NFPA is non secreting pituitary adenomas that are slowly growing tumors. They are commonly presented with compressing mass effect on adjacent structure like optic chiasm or 3rd ventricle. Once the adenoma is greater than 10mm it would be called macroadenoma that started to induce symptoms. Surgical intervention is considered the treatment of choice for such condition. (3) However, few cases were reported to have a spontaneous resolution without any surgical intervention. NFPA might regress because of apoplexy, when it does not induce severe presentation to be considered as a neurosurgical emergency requiring prompt surgery. (4) Regression of such pathologies may be due to autoimmune lymphocytic hypophysitis after few months of treatment with minimal hormonal abnormalities with no significant mass effect. (5) Another case was reported to have resolution due to COVID 19 infection and thought to be related to autoimmune response. (6) Some reported a case of pituitary macroadenoma associated with abnormal liver enzymes that spontaneously regressed in short period of time without any treatment. It was thought that this pathology associates viral infection. (7) The current studied patient revealed a remarkable decrease in tumor size over 10 years period. The patient remained asymptomatic with no compressive symptoms, nor hormonal abnormalities. She remained under surveillance with no treatment. The regression was slow, however, measurable. The natural history of such conditions is not well reported or described because most of those patients underwent surgery. Others in their review stated that the rate of spontaneous resolution was estimated to be 11%. (3) This entity is not well elaborated and needs an extra comprehensive literature review. This aims to study extensively other pathophysiological causes of NFPA and the possibility of etiology that is responsible for regression.

4. References

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