The Prolactinoma Predicament; To Treat Medically Or Surgically

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Introduction

Hormonal effects of prolactinomas include central hypogonadism, infertility, and breast symptoms. When the mass is large enough to abut or compress the optic chiasm, prompt treatment is critical to preserve vision. Prolactin secretion is usually proportional to the size of the adenoma. This case describes a patient who presented with prominent vision changes and was found to have a large pituitary macroadenoma with lower than expected prolactin elevation, highlighting the dilemma between medical versus surgical treatment.

Case Presentation

A previously healthy 32 year old male first noticed vision changes in October 2019 when he was unable to see the dots to focus a camera. Due to the COVID-19 pandemic, he delayed seeking care. When he visited a neuro-ophthalmologist in September 2020, he was noted to have dense left eye and mild right eye temporal defects, left afferent pupillary defect, and left greater than right optic disc pallor suspicious for a sellar lesion. MRI in September 2020 showed a sellar and suprasellar mass measuring 3.4 cm tall with left greater than right optic chiasm compression. He was referred to endocrinology, where further history revealed low libido. Physical exam showed BMI 38.7, lipomastia, normal body hair, and normal testicular volume bilaterally. In September 2020, labs confirmed hyperprolactinemia and central hypogonadism, though prolactin was lower than expected given the size of the pituitary mass. Cabergoline was started with goals to shrink the adenoma, alleviate optic chiasm compression and restore gonadal function. By October 2020, the patient's prolactin normalized and he was tolerating cabergoline. By December, there was marked reduction in the size of the pituitary mass on MRI to 2.1 cm in height as well as decreased optic chiasm compression. He had significant improvement in visual fields, improved visual acuity, slightly less prominent afferent papillary defect, and improved libido. As well, the patient's prolactin and testosterone levels normalized.

Diagnostic Testing

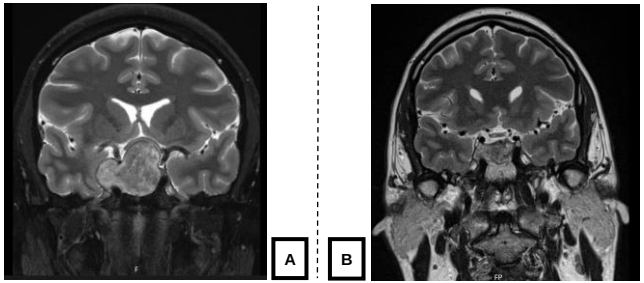

FIG. 1. A: MRI brain 9/2020 showing a sellar mass, measuring 4.1 x 2.4 x 3.4 cm pre-treatment with suprasellar extension with elevation and compression of optic chiasm. **B.** MRI brain 12/2020 showing interval decrease in size of sellar mass, now measuring 2.4 x 2.8 x 2.1 cm post-treatment with decreased mass effect on the optic chiasm.

Visual Field Exam (VFE)

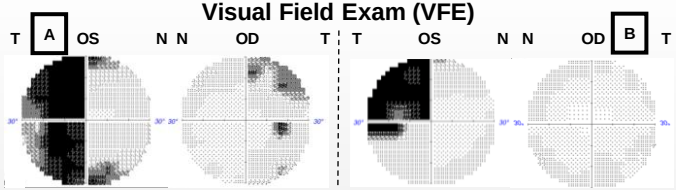

FIG. 2. A: 9/2020 VFE with left eye (OS) total superior temporal (T) and inferior temporal hemianopsia with right eye (OD) partial superior and inferior temporal vision defects with mostly normal nasal (N) vision bilaterally. **B.** 3/2021 VFE with OS total superior temporal quandrantopsia with partial inferior temporal quandrantopsia, normal OS nasal vision and normal OD nasal and temporal vision.

Hormone	Pre-Treatment 9/2020	Post-Treatment 12/2020	Post-Treatment 3/2021	Reference Range
Prolactin (ng/ml)	302.4*	7.4*	3.4	2-18
Testosterone (ng/dl)	119	227	358	250-1100
FSH (mIU/ml)	2.0	N/A	N/A	1.6-8.0
LH (mIU/ml)	1.7	N/A	N/A	1.5-9.3

***Via Serial Dilution**

Table 1: Hormone levels pre- and post-treatment with cabergoline.

Discussion

This case illustrates the classic presentation of a patient with a large prolactinoma with hormonal and mass effects. It highlights the role of primary dopamine agonist therapy to treat large prolactinomas causing visual impairment with lower than expected prolactin given the size of the pituitary mass. In this case, the pituitary adenoma may have been an inefficient prolactin secretor due to being poorly differentiated or partially cystic, but treating medically was effective in quickly shrinking the mass and improving his vision, thus avoiding the need for surgery. In general, medical management has comparable efficacy to transsphenoidal surgery (1,2). Large non-functioning adenomas (NFA) of the pituitary can present similarly via the stalk effect by compressing the portal vessels inhibiting delivery of dopamine from the hypothalamus to the pituitary (3). The Endocrine Society has reported 250 ng/ml as the cut-off between prolactinoma and NFA (4), whereas the Pituitary Society reported serum prolactin levels over 150 ng/ml to be suggestive of a prolactinoma (3). In general, there is a linear correlation between adenoma size and serum prolactin level below which the stalk effect should be suspected and above which prolactinoma should be suspected (5). If stalk effect is thought to be the cause, management with surgery is usually the first choice (6). Therefore it is important to recognize a NFA as resection would be recommended whereas medical management would be indicated for a prolactinoma (3).

Conclusion

- Distinguishing between a NFA causing stalk effect and prolactinoma is key to guiding diagnosis and treatment of these phenomenon
- Degree of serum prolactin elevation and tumor size should be considered together to distinguish between the possible etiologies of a sellar mass.

References

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