

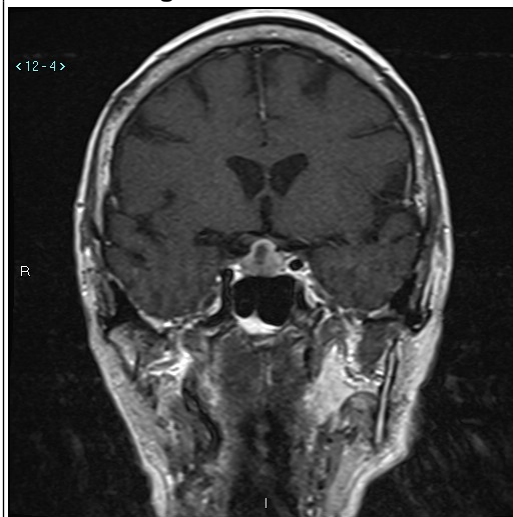
## Introduction

Pituitary adenomas account for up to 15% of intracranial masses with the most common subtypes being prolactinomas and non-functioning pituitary adenomas (NFPA)<sup>1</sup>. The gold standard of treatment for prolactinomas is anti-dopaminergic medication while for non-functioning pituitary adenomas it is surgical resection<sup>2</sup>. Though surgical resection is the mainstay of treatment for NFPA at this time, there are several known pathways involved in NFPA tumorigenesis and, thus, targeted medical therapy may prove to be a valid treatment modality for NFPA.

## Case Report

A 71-year-old woman was referred for evaluation of an asymptomatic non-secreting pituitary adenoma. The adenoma measured 9 mm in height x 10 mm in width x 9 mm in AP diameter on MRI imaging in 2008. The patient was followed with serial MRIs. In March of 2016, the tumor was found to have increased in size to 14mm x 16mm x 9mm in the same dimensions (Figure 1). No treatment for her enlarging pituitary adenoma was recommended because she had recently developed recurrent metastatic breast cancer.

**Figure 1. NFPA 2016**

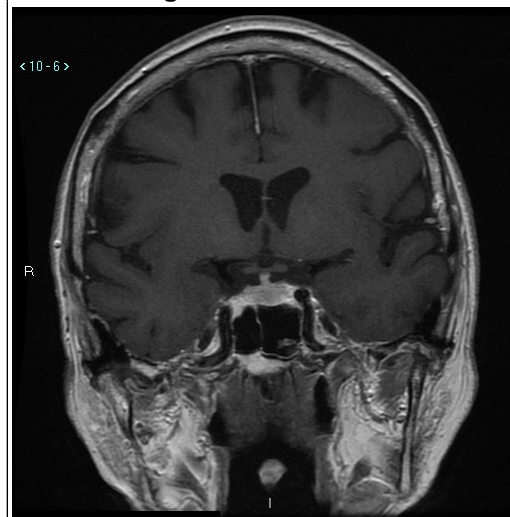


Post-gadolinium coronal T1-weighted MRI of the pituitary adenoma in 2016 measuring 14mm in height x 16mm in width x 9mm in AP diameter.

## Results

The patient treated for her recurrence of breast cancer with palbociclib, a cyclin dependent kinase (CDK) 4/6 inhibitor. This inhibitor acts on a pathway believed to be involved in pituitary adenoma tumorigenesis. One year after starting palbociclib, routine imaging demonstrated significant regression of her pituitary adenoma. Now, after two years of palbociclib treatment, her tumor continues to regress and measures 8mm x 10mm x 8.5mm (Figure 2).

**Figure 2. NFPA 2018**



Post-gadolinium coronal T1-weighted MRI of the pituitary adenoma in 2018 measuring 8mm in height x 10mm in width x 8.5mm in AP diameter.

## Discussion

Studies on human pituitary adenomas have confirmed the involvement of this pathway in pituitary tumorigenesis. In a study by Simpson et al. abnormal expression of either pRb, p16, or cyclin D1 was seen in 80% of tumors<sup>3</sup>. Two additional studies, by Jordan et al. and Hibberts et al. independently demonstrated overexpression of cyclin D1 in 67% of nonfunctioning pituitary adenomas<sup>4,5</sup>. Furthermore, this pathway has been implicated in pituitary adenoma recurrence following resection<sup>6</sup>.

## Conclusions

We hypothesize that inhibition of the CDK 4/6 pathway by palbociclib contributed to adenoma regression in this patient, and that palbociclib may represent a possible adjuvant therapy for the treatment of nonfunctioning pituitary adenomas. Furthermore, we postulate that there are other well-known pathways involved in NFPA tumorigenesis that may represent potential therapeutic targets.

## References

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