**Postmenopausal Hook Effect**

**Rumeysa Çolak, Burcu Çoban, Muhammet Özer, Başak Özen Saydam*, Erdener Özer**, Nuri Karabay**, A. Serkan Yener***

Dokuz Eylül University Faculty of Medicine, Department of Internal Medicine, Izmir, Turkey

*Dokuz Eylül University Faculty of Medicine, Department of Internal Medicine, Division of Endocrinology and Metabolism, Izmir, Turkey

**Dokuz Eylül University Faculty of Medicine, Department of Medical Pathology, Izmir, Turkey

***Dokuz Eylül University Faculty of Medicine, Department of Radiology, Izmir, Turkey

**Abstract**

**Introduction:** Prolactinoma is the most common functional pituitary adenoma. The degree of serum prolactin (PRL) is correlated with the size of the adenoma and the PRL level is usually >250 ng/dL in macroadenomas. In non-functional pituitary adenomas, moderate PRL elevation due to compression effect can be seen, but in patients with prolactinoma, false - PRL may be lower in serum bound to Hook Effect. The differential diagnosis of non-functional adenomas and prolactinomas is important because of the different treatment options (1,2). Here we present a patient with Postmenopausal prolactinoma, identified with Hook Effect, whom we confessed by dilution.

**Case:** At the age of 61, a postmenopausal female patient with no additional comorbid syndrome was diagnosed as a pituitary mass in the cranial MR due to headache, and we were directed to make hormonal examinations. No acromegaly or cushingoid appearance on the physical examination of the patient who did not show visual disturbance or galactorrhea, no significant neurological deficit was detected. In the hormone panel; Prolactin (PRL): 202 ng/mL (3.8-26.7), Cortisol 10.6 mg/dL (6.7-23), ACTH 18.9 pg/mL (0-46), FSH 3.66 (16.7-113) mIU/mL LH: 0.14 mIU/mL (14.2-52), IGFI: 110 ng/mL, TSH: 0.79 mIU/mL (0.38-5.33) and T4: 0.72 ng/dL (0.5-1.51). There was no narrative of drug use that could lead to hyperprolactinaemia in the interrogation. In the pituitary MR, a mass lesion of 20x20x28 mm in size, filling the sella cavity, compressing right optic nerve and right cavernous sinus was detected. Because of the advanced age and postmenopausal features in the patient with macroadenomas and moderate hyperprolactinemia, an elevation of the prolactin in the anterior infundibulum was noted. However, in order to exclude the possible Hook Phenomenon, the PRL was 3100 ng/mL, which we looked at using the 1/100 dilution method. The patient was then evaluated as Prolactinoma and Cabergoline started at 1 mg/week. After 3 weeks, the patient who came to the control came to PRL 656 ng/mL. A narrowing of the visual field examination of the patient with the findings of the nerve compression was found. It was reevaluated by Neurosurgery and decision of operation was taken. Postpathology was compatible with prolactin-producing adenoma. Cabergolin continued to be treated at 1.5 mg/week and was regressed to PRL 123 ng/mL. The patient’s polyclinical is continuing its follow-up in terms of diabetes insipitus and central hypothyroidism.

**Discussion:** Pituitary adenomas are the most common causes of sellar masses and constitute about one third of all intracranial tumors. They is classified using hormone producing cell type (determined by immunohistochemistry method) or clinically functional/non-functional. Among the functional pituitary adenomas, prolactinomas are the most common pituitary adenomas (approximately 50%). In literature, 83.3% of cases with macroadenomas are male, mean age is 38.5 years (5). Our case is 61 years old and differs because it is postmenopausal. Direct prolactin measurement is important for the differential diagnosis of hypophylic tumors. In non-functioning tumors with neurological deficit, the first treatment option is surgical, whereas the medical treatment is prophylactic in prolaxed patients. Despite the presence of prolactinoma in our case, medical treatment as well as surgical treatment have been approved due to the presence of visual deficiency, PRL measurements are stimulant in the sense of ‘hook effect’, which has normal or normal light measurements despite the presence of macroadenomas (3) and the incidence of this phenomenon in patients with macroadenomas is %5-8 (4). Hook effect is an artifact encountered in immunoradiometric (ECLIA, ICMA, IRMA vb) measures and results in very high prolactin levels. In this case, the serum sample should be diluted to 1/100 and prolactin measurement should be repeated. Alternatively, the first antibody should be rinsed to remove excess prolactin that has not been ligated before the second antibody is added after the prolactin has been attached. The presence of non-functional macroadenoma sap in the presence of an elevated PRL height (<200 ng/mL) should be suspected and is difficult to distinguish from macroadoprolactin (1).

**Results:** The distinction is important because non-functional adenomas and prolactinomas have different first-line treatment options. In cases of macroadenoma and moderate PRL elevation. Hook effect should come to mind as well as stem pressure. Hook effect is a rare entity in post-menopausal older women. In suspected cases, this effect can be avoided by using serial dilution methods.

**References**