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# Pituitary Metastasis Of Breast Carcinoma: A Case Report

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***Abstract***
*Pituitary is an uncommon site for metastatic spread. The clinical presentation varies, often being asymptomatic, but may include visual abnormalities, pituitary deficits, and/or diabetes insipidus. Management options include surgery, radiation therapy, chemotherapy/immunotherapy, hormone replacement therapy, or a conservative approach. Clinicians need to be vigilant about the various presentations of pituitary metastasis, given the improved survival rates of cancer patients. We present a case of a patient with breast cancer who developed pituitary metastasis.*

***Keywords****: Pituitary metastasis, Breast cancer, Hypothalamic pituitary MRI, histology.*

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## I. Introduction

Pituitary metastasis (PM) is rare, with variable incidence. Breast and lung cancers are the tumors that most frequently metastasize to the pituitary gland [1]. Often asymptomatic, their prevalence is higher in autopsy series [1]. They can be discovered incidentally during imaging work-ups in patients with advanced neoplastic disease [2]. PM presents a diagnostic challenge as it must be differentiated from pituitary adenomas due to the lack of pathognomonic clinical, biological, and radiological signs [2]. The definitive diagnosis is histological. Management may involve hormone replacement therapy, surgery, radio-chemotherapy/immunotherapy, or a conservative approach [3]. We report a case of PM from breast carcinoma in a seventy-three-year-old female patient.

## II. Case Report

A 73-year-old woman with a history of left breast carcinoma, who underwent a mastectomy followed by chemotherapy, radiotherapy, and hormonal treatment. Monitoring has objectified the appearance of pulmonary, mediastinal, hepatic and bone metastasis. Three years later, the patient presented with headaches, asthenia, and constipation, but without polyuria-polydipsia syndrome. Clinical examination showed a normotensive, normocardial patient with general impairment. Hypothalamic-pituitary MRI (Figure 1) revealed nodular thickening of the pituitary stalk, described as isointense on T1 and hyperintense on T2 , hypertrophy of the pituitary gland, and absence of visualization of the posterior pituitary. Multifocal meningeal thickening was noted, with right frontal, temporal, and irregular left posterior parietal lesions after contrast medium injection, suggesting secondary involvement of the pituitary stalk, pituitary gland, meninges, and bones. Investigations showed hyperprolactinemia, hypogonadotropic hypogonadism, central hypothyroidism with preserved corticotropic function. Diabetes insipidus was not present. Given the multi-metastatic nature of the breast cancer, we initiated hormone replacement therapy with thyroid hormones and provided palliative care.

## III. Discussion

PM is a rare condition reported for the first by Ludwig Benjamin in 1857 and subsequently by Harvey Cushing in 1913 [4]. It is rare, accounting for only 0.4% of secondary intracranial tumors. Recently, the incidence of PM diagnosed early is increasing, given the increased survival of cancer patients and the improvement of biological and radiological means of exploration [1,5]. PM can be observed at any age [6]. Usually, they affect patients in the sixth or seventh decade of life, with no clear sex predominance [5]. In our case, it is a seventy-three-year-old female patient.

The primary tumor responsible for PM is essentially represented by lung cancer in men and breast cancer in women [7]. Other primary tumors can be observed, such as prostate tumors, renal, gastrointestinal, thyroid and others [8].

The mechanism of occurrence of MP is either by hematogenous dissemination, direct invasion from the base of the skull and meningeal spread [9]. PM has a predilection for the neurohypophysis, because it is directly exposed to the arterial circulation [7, 10]. Involvement of the adenohypophysis is observed only in 15% of cases [6]. The risk of PM from breast cancer is significantly higher compared to other cancers [1, 11]. It is hypothesized that it elevates hormone levels in the pituitary gland, especially prolactin, which may attract metastatic cells [12]. In a recently published study, HER2-overexpressing breast cancers appeared to be more prone to metastasize to the pituitary [13] .

MP are generally associated with advanced stages of cancer, they may represent the only metastasis in some cases or even precede the discovery of the primary tumor [14].

In our case the MP is discovered after 3.5 years of evolution of breast cancer.

Patients are often asymptomatic, only 7% of PM are symptomatic [6]. Diabetes insipidus is present in the vast majority of cases [15]. Other signs can be observed such as visual disturbances, cranial nerve palsies and headaches [14]. Anterior pituitary insufficiency has been reported in approximately 25 to 45% of cases. Disconnection hyperprolactinemia is found in about 2/3 of cases. Hyperfunction is rarer, but cases of acromegaly and Cushing's syndrome have been reported.

In our case, the biological assessment showed central hypothyroidism, and hypogonadotropic hypogonadism with no other abnormalities. Given the asymptomatic nature of PM, most are discovered incidentally on imaging examinations requested for other clinical reasons. MRI are sensitive but non-specific imaging modalities [16]. The presence of metastatic lesions in another area of the central nervous system, invasion of the cavernous sinus, sclerotic changes around the sella turcica and clivus, isointense signal in T1 and T2 images, and loss of hyperintensity of the neurohypophysis have been useful in differentiating metastatic from benign lesions [17].

The differential diagnosis of other sellar lesions is often difficult, especially in the absence of a history of primary malignancy. In our case, MRI showed nodular thickening of the pituitary stalk, hypertrophy of the pituitary gland and absence of visualization of the posterior pituitary. Multifocal meningeal thickening, right frontal and temporal and irregular left posterior parietal repulsed after injection of the contrast medium (appearance in favor of secondary locations, of the pituitary stalk, pituitary gland, meninges and bones) (Figure1).

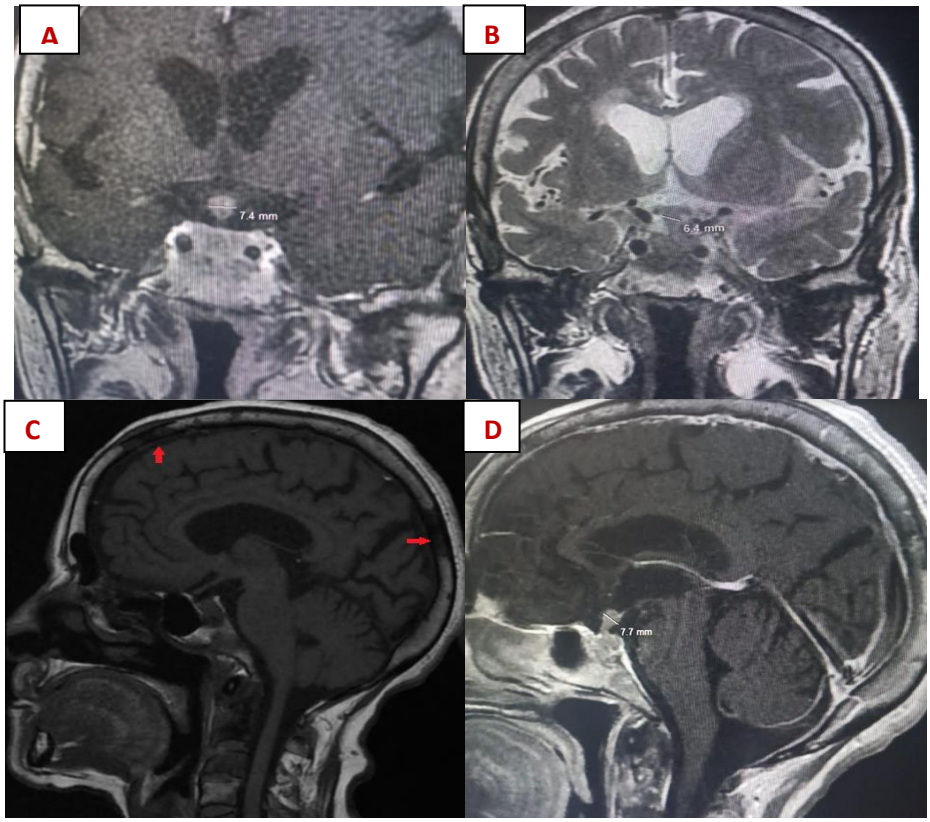


**Figure 1: Coronal (A,B) and Sagital (C,D) MRI showed nodular thickening of the pituitary stalk, hypertrophy of the pituitary gland and absence of visualization of the posterior pituitary Multifocal meningeal thickening, right frontal and temporal and irregular left posterior parietal repulsed after injection of the contrast medium**

The role of functional imaging with PET-FDG is limited. The diagnosis of MP is histological.

There is no codified treatment to manage MP due to lack of data and limited survival of the patients [18]. A number of approaches can be used, including surgical resection, radiosurgery, radiation therapy, chemotherapy, and hormone therapy [19,20].

Palliative treatment, associated with hormone replacement therapy, was proposed to our patient.

Survival depends on the type and stage of the primary cancer. Historically, the average survival was 6 to 7 months [17]. Currently, survival is 49% at 1 year, reflecting progress in the diagnosis and management of malignant diseases [3].

## IV. Conclusion

Pituitary metastasis is rare. The most common primary cancers are breast cancer in women and lung cancer in man. The most frequently found deficit revealing the lesion pituitary is diabetes insipidus. However, PM is often asymptomatic suggesting that clinicians should be mindful of screening for hypopituitarism in patients with known malignancy.

Management is not codified, and its main objective is to improve survival. Further studies are needed to determine the safety and effectiveness of different PM management strategies.

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