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Macroprolactinemia In Patients Post Breast Augmentation: A Case Report

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Background:
Macroprolactin is a large antigen-antibody complex of molecular weight which should always be suspected when a patient's clinical history is incompatible with prolactin value.
Objectives:
To study the relation between development of macroprolactnemia and breast augmentation.
Material and methods:
A case study of 44 years old female patient who referred to primary health care with hyperprolactnemia.
Results:
I patient underwent breast augmentation who presented with hyperprolactinemia with no symptoms, the macroprolactnemia should be rolled out to prevent unnecessary investigations into the cause for hyperprolactinaemia.
Conclusion:
In patient who underwent breast augmentation and presented with hyperprolactnemia with no symptoms the macroprolactnemia should be rulled out before doing unnecessary investigations into the cause for hyperprolactinaemia.

Keywords: Macroprolactnemia, hyperprolactnemia, breast augmentation

Introduction

Prolactin is a hormone secreted by the anterior pituitary gland that is essential for lactation. Elevated levels of serum prolactin(hyperprolactinemia), can lead to clinical manifestations such as amenorrhea and galactorrhea in women, and erectile dysfunction or impotence in men.[1]

Physiological elevation of prolactin occurs during pregnancy, while pathological hyperprolactinemia may result from a prolactin-secreting pituitary adenoma (prolactinoma), disorders affecting the hypothalamus or pituitary that compress the pituitary stalk, the use of antidopaminergic medications, or underlying hypothyroidism.[1]

Macroprolactinemia is a laboratory artifact encountered during prolactin testing. It involves the presence of macroprolactins, which are complexes formed between prolactin and immunoglobulin G (IgG) autoantibodies, resulting in molecules that are approximately six to seven times larger than native prolactin.[2]

Breast augmentation is among the most frequently performed cosmetic surgical procedures. Several case reports have described the occurrence of transient hyperprolactinemia and galactorrhea following breast implant surgery.[3]

Case Presentation:

This patient presented to King Fahad Hospital Al Hasa – Endocrine Center on December 2022 referred from Primary health care with high prolactin level found in annual investigation.

The patient is 45 years old single lady status post lumpectomy of benign breast lump and mammoplasty with silicon augmentation of right and left breast which done 1 year before presentation. referred from Primary health care with high prolactin level found in annual investigation.

The patient denied galactorrhea, breast pain or discharge. She has no headache or visual complain. No symptoms suggestive of thyroid disorders and she take no medications.

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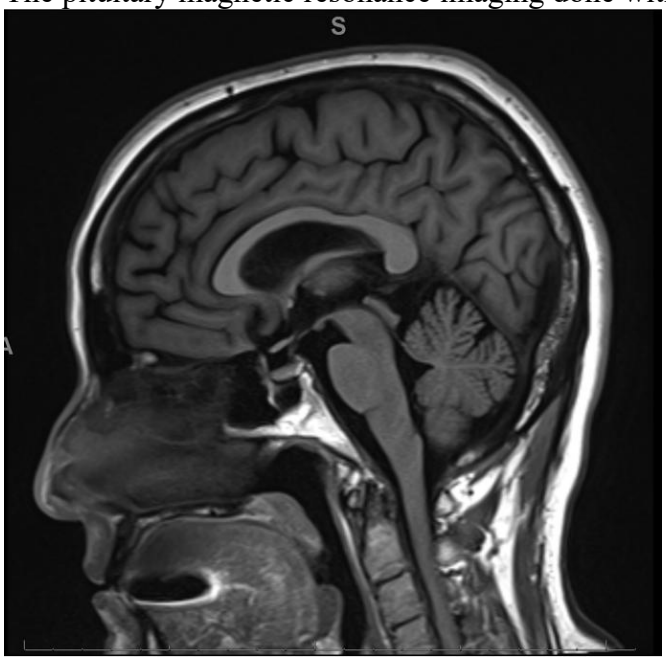
She has regular period every 24 days.
No family history of endocrine disorders.
Table (1) the initial investigation done on Dec 2022

Prolactin	53 ng/ml
Luteinizing hormone	15.1 mIU/ml
Follicle stimulating hormone	7.4 mIU/ml
Thyroid stimulation hormone	4.1 uIU/ml

The patient followed up in the clinic with repeated investigation of prolactin which show increasing in level with no symptoms the result as follow:

Prolactin	Date
32.52 ng/ml	Mar 07 /2023
135.5 ng/ml	Feb 05/2024
50.7 ng/ml	May 30 /2024

The pituitary magnetic resonance imaging done with show no evidence of pituitary adenoma or lesion.



The pituitary magnetic resonance imaging

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Mammogram of right and left breasts

Discussion:

In patient with hyperprolactnemia with no symptoms, macroprolactinemia should be suspected. Our patient is 45 years old single lady status post lumpectomy of benign breast lump and mammoplasty who referred with high prolactin level found in annual investigation. The patient denied any symptoms of hyperprolactinemia or symptoms suggestive of thyroid disorders. She has no headache or visual complain. She underwent pituitary MRI which show no pituitary lesions. Also, the thyroid function was normal. The level of prolactin is increasing while the patient still asymptomatic.

Another patient was referred to king Abdulaziz hospital national guard Riyadh with the same presentation. She is 25 years old female married with 2 children and 9 months post breast augmentation referred from primary health care with hyperprolactinemia found in routine investigation. She is asymptomatic. The pituitary MRI show no pituitary lesions and the labs confirm the presence of macroprolactin.

Macroprolactinemia is a laboratory artifact encountered during prolactin testing. It involves the presence of macroprolactins, which are complexes formed between prolactin and immunoglobulin G (IgG) autoantibodies, resulting in molecules that are approximately six to seven times larger than native prolactin. The underlying mechanism responsible for the formation of these prolactin autoantibodies in individuals with macroprolactinemia remains unclear.[2]

It is thought that both genetic susceptibility and posttranslational modifications of the prolactin molecule—such as glycosylation, phosphorylation, and deamination—may contribute to the development of autoantibodies against prolactin.[2]

Macroprolactins are thought to lack biological activity because their large molecular size prevents them from binding to prolactin receptors. Nevertheless, they tend to persist in the bloodstream for extended periods, as the kidneys are unable to effectively clear them due to their size. Routine prolactin assays often detect these complexes—since they cannot distinguish between monomeric prolactin and macroprolactin—resulting in falsely elevated prolactin readings and an incorrect diagnosis of

hyperprolactinemia in individuals who show no clinical symptoms of elevated native prolactin.[2]
Therefore, macroprolactinemia is considered a classic example of an endocrine laboratory artifact ("laboma"), which can result in unnecessary treatment and potential iatrogenic complications. The polyethylene glycol (PEG) precipitation test is the most used and convenient technique to separate macroprolactin from serum samples. However, some studies have indicated that as much as 25% of monomeric prolactin may also precipitate during this process, potentially giving a misleading diagnosis of macroprolactinemia.[2]
Breast augmentation is among the most frequently performed cosmetic surgical procedures. Several case reports have described the occurrence of transient hyperprolactinemia and galactorrhea following breast implant surgery.[3]
Serum prolactin concentrations were determined using commercially available chemiluminescent immunoassays. Hyperprolactinemia was diagnosed when prolactin levels exceeded the established normal reference range. To identify the underlying cause, additional laboratory tests were conducted, including measurements of β-hCG, TSH, free T4, and IGF-1 levels, along with assessments of renal and hepatic function. Screening for macroprolactin was also performed using the polyethylene glycol (PEG) precipitation technique.[5]

Conclusion:
In patient who underwent breast augmentation and presented with hyperprolactnemia with no symptoms the macroprolactinemia should be ruled out before doing unnecessary investigations into the cause for hyperprolactinaemia. Evaluating more patients with the same presentation is needed. Also to consider the type of breast augmentation if it has impact on developing macroprolactinemia.

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