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Ovarian Stromal Hyperthecosis Mimicking PCOS: A Rare Case of Benign Abdomino - Pelvic Mass a Review

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Abstract: ***The purpose of this article is to highlight the diagnostic challenges and therapeutic outcomes of a rare case of ovarian stromal hyperthecosis presenting with PCOS features, aiming to contribute to the broader knowledge and management strategies for this condition. The term hyperthecosis refers to the presence of nests of lutenized theca cells in the ovarian stroma due to differentiation of the ovarian interstitial cells into steroidogenically active luteinized stromal cells producing excessive amounts of testosterone commonly presents in postmenopausal women with symptoms similar to those of polycystic ovarian syndrome. The disorder can result in metabolic abnormalities such as insulin resistance which can then lead to hyperinsulinemia. Hyperinsulinemia can result in an increased risk for Type 2 Diabetes Mellitus and cardiovascular disease. Acne and hirsutism secondary to high testosterone levels, which commonly represents. The study reports a rare case of ovarian stromal hyperthecosis presenting with features akin to Polycystic Ovarian Syndrome PCOS in a 44 - year - old pre - menopausal woman with Type 2 Diabetes Mellitus. Characterized by excessive testosterone production due to lutenized theca cells in the ovarian stroma, the condition mirrors PCOS symptoms, complicating diagnosis and treatment. The diagnosis of ovarian hyperthecosis was confirmed on histological examination. There is improvement in their hyperandrogenic symptoms, testosterone levels, and biochemical features of insulin resistance after surgical intervention. This case underscores the importance of differential diagnosis in hyperandrogenic conditions, particularly when testosterone levels are subdiagnostic. Post - surgical intervention showed significant improvement, highlighting the need for further research into the pathophysiology and diagnostic criteria of ovarian hyperthecosis.***

Keywords: ovarian hyperthecosis; hyperandrogenism; pcos; metabolic syndrome; postmenopausal status; oophorectomy

1. Introduction

Ovarian hyperthecosis refers to a process in which ovarian cells differentiate into clusters of luteinized thecal cells in the ovarian stroma producing excessive amounts of testosterone. This condition commonly presents in postmenopausal women with symptoms similar to that of polycystic ovarian syndrome. The disorder can result in metabolic abnormalities such as insulin resistance which can then lead to hyperinsulinemia. Hyperinsulinemia can result in an increased risk for Type 2 Diabetes Mellitus and cardiovascular disease. Acne and hirsutism secondary to high testosterone levels are also commonly present. Women with Ovarian hyperthecosis typically present during their postmenopausal years, and occasionally premenopausal years, with worsening hirsutism, virilization, obesity, and insulin resistance. The clinical features of hyperthecosis are similar to those observed in polycystic ovarian disease (PCOD), but patients with hyperthecosis are not only severely hirsute but also virilized. In PCOD, the luteinized thecal cells are confined to the areas around the cystic follicles, whereas in hyperthecosis, islands of luteinized cells are scattered all over the stroma, away from follicles and close to the hilum. This article describes a case of ovarian stromal hyperthecosis presenting with pcos features - A rare case presenting as a benign abdomino - pelvic mass. With symptomatic features, laboratory levels below the standard diagnostic criteria. The discussed cases highlight the importance of using clinical impression and metabolic symptomology to confirm the diagnosis of ovarian hyperthecosis and pcod although testosterone levels may be below the usual diagnostic threshold for the disease.

2. Case Presentation

A 44 - year - old nulligravida with pre menopausal status with Type 2 Diabetes Mellitus presented as a history of abdominal distention associated with pain abdomen past 1 month with history of dyslipidemia, hypertension, polycystic ovarian syndrome, and obstructive sleep apnea. referred to endocrinology. She also has feature of hirsutism, acne, excessive hair loss, acanthosis nigrican with irregular cycle and weight gain.

On examination - patient showing on per abdomen - A firm mass (~34weeks gravid uterus), well defined upper and lateral margins, smooth surface with restricted mobility. The P/V/R - Uterus normal in size, Anteverted, Right forniceal fullness present, left fornix free and non - tender.

On investigation: - Ca~125 = 101.30, CEA= 1.08ngdcl HBA1c=8, TSH =3.6, S. total testosterone =5.5ng/dl (1.1 - 3.6ng/dl). The endometrial biopsy show simple hyperplasia without Atypia.

The CECT Imaging result show Large enhancing solid cystic lesion in right adnexa ~ 13.5 x 24 x 21 mm with thick wall and septations, showing heterogeneous enhancement of solid component and septae extending anterior upto the anterior abdominal wall displacing the small bowel loop.

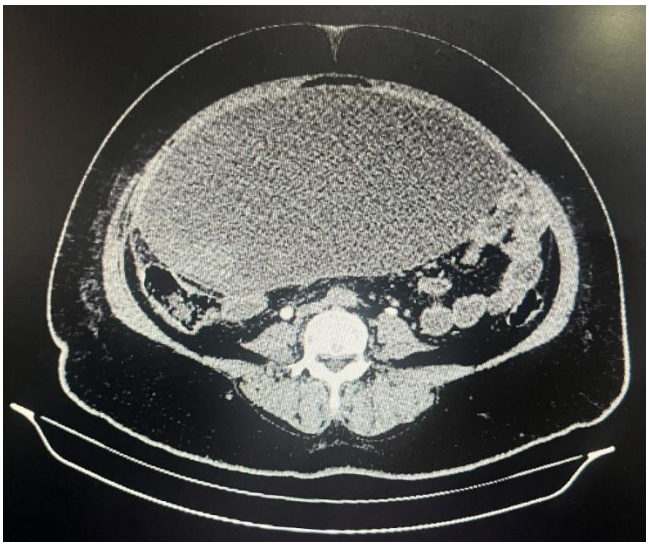

Figure 1: CECT Imaging

Procedure: - Patient underwent Exploratory Laparotomy with removal of Right Ovarian mass with TAH with LSO with Infra - Colic Omentectomy with Appendesectomy with Wash Cytology. The Intra - Operative findings showed 25×30 Solid cystic mass arising from right ovary adherent to anterior abdominal wall and omentum with pre - op rupture of capsule, hemorrhagic necrosis at base of pedicle, left ovary bulky with polycystic change, uterus normal in size.

HPE: - Ovarian hyperthecosis with stromal hyperplasia of right ovary and multiple cystic follicles with polycystic changes of left ovary and the Cytopathology result showed Peritoneal wash fluid is negative for malignant cells. The Testosterone levels normalized during post - op period.

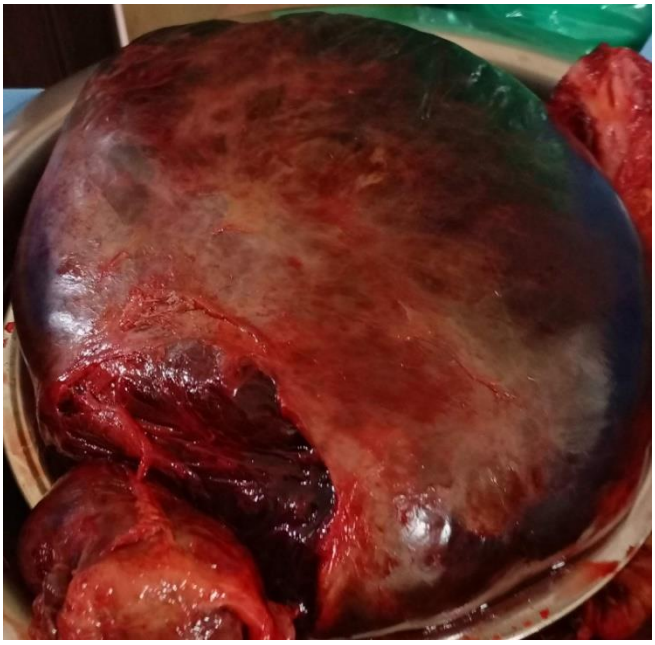

Figure 2: Intra Operative Mass

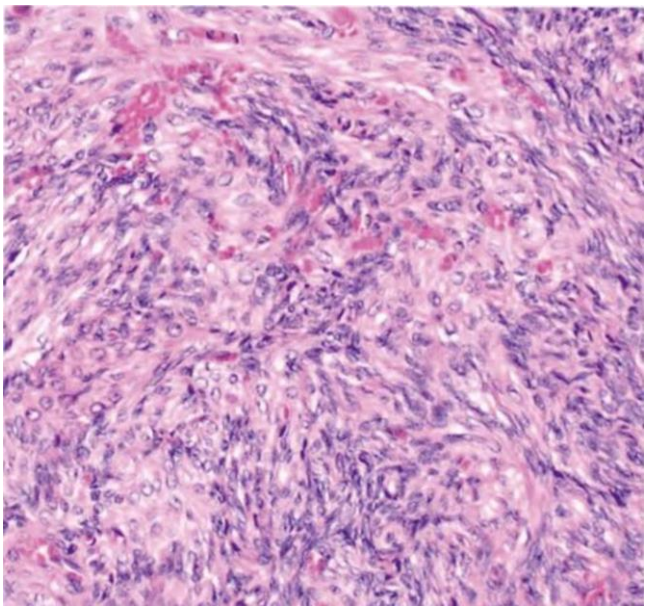

Figure 3: Histopathological Examination (HPE)

3. Discussion

Ovarian hyperthecosis is a benign condition characterized by overproduction of androgen from stromal cells associated with endometrial hyperplasia and increased risk of endometrial cancer. Severe hyperandrogenism in pre - menopousal women from ovarian sources can be seen in secretary tumor as well as ovarian hyperthecosis. There is minimal guidance regarding the extent of required made - up and imaging modality of choice. The initial diagnosis of tumors of unknown aetiology was based on radiological findings and ovarian hyperthecosis in a histopathological diagnosis that required a high degree of clinical suspicion.

In premenopausal women who do have severe hyperandrogenism, androgen - secreting ovarian and adrenal tumors must be considered, but they are very rare. This case emphasizes the importance of including ovarian hyperthecosis in the differential diagnosis when a pre -

menopausal woman presents with hirsutism, symptoms of virilization, or symptoms of rapidly progressive insulin resistance (in the absence of clinical or biochemical abnormalities of other etiologies such as Cushing's syndrome or hypothyroidism). Current guidelines recommend that ovarian hyperthecosis is less likely if total serum testosterone levels are below 150 ng/dL.

Ovarian hyperthecosis (OHT) is one cause of severe hyperandrogenism, other causes include androgen - secreting ovarian and adrenal tumors. In women who present with severe hyperandrogenism (eg, virilization) and an increased testosterone concentration >150 ng/dL (>5.2 nmol/L), the next step of the evaluation is to perform additional imaging to find the source of androgen production. Imaging of the ovaries (ultrasound and magnetic resonance imaging [MRI] if needed) and adrenals (by computed tomography [CT] scan and/or MRI) are performed to rule out testosterone - producing tumor.

In addition, transvaginal ultrasound in women with hyperthecosis usually shows a bilateral increase in ovarian stroma. Unlike polycystic ovary disease, where the ovaries characteristically have a polycystic/multifollicular appearance with 20 or more antral follicles of 2 to 9 mm per ovary and/or ovarian volume >10 cm3 (12) , few cysts are seen in severe hyperthecosis and the ovaries appear more solid. The differential diagnosis include Androgen - secreting ovarian and adrenal tumors.

Additionally, there is an increased risk of endometrial hyperplasia, polyps and endometrioid adenocarcinoma due to hyperestrogenism caused by the aromatization of excessive amounts of testosterone to oestrogens.

Thereby In the workup of patients presenting with elevated total serum testosterone levels and virilization, the first step is to identify the source of the excess androgen production. Pelvic ultrasound in women with hyperthecosis is recommended to rule out androgen- producing tumors and usually shows a bilateral increase in ovarian size and stroma. If imaging is negative and a strong suspicion of ovarian hyperthecosis remains, the next step is to perform ovarian venous sampling. It is important to note, however, that ovarian venous sampling is an advanced procedure requiring technical expertise, and evidence for using it in clinical practice is not substantiated. Additionally, the procedure is not offered at all facilities.

Insulin resistance is a key component in identifying ovarian hyperthecosis. It is important to measure sex hormone - binding globulin (SHBG) levels as low levels can serve as a predictive marker for insulin resistance when underlying hyperandrogenism is a suspected cause. Once hyperthecosis is suspected, it is vital to address and manage the various complications caused by increased androgen levels. Patients should be counseled on weight control, lifestyle modifications, and started on metformin for better glycemic control if HbA1c is elevated. The definitive treatment for patients with hyperthecosis is surgery and diagnosis of hyperthecosis is confirmed only by histological analysis. If patients are unable to tolerate surgery, treatment with a long - term gonadotropin - releasing hormone agonist is recommended to suppress the HPG axis. Currently, a surgical approach is preferred for the management of hyperthecosis over medical management.

The Treatment of ovarian hyperthecosis (OHT) should include therapy for hyperandrogenism (hirsutism and virilization), anovulation, obesity, and insulin resistance. The primary goal of treatment is to eliminate the excessive testosterone production. However, normalization of hyperandrogenism after surgery for androgen - secreting ovarian tumors is not always followed by an improvement in body weight or insulin sensitivity. The Testosterone levels normalized during post - operative period.

In the Premenopausal women pursuing fertility gonadotropin - releasing hormone (GnRH) agonist therapy to prevent worsening of the patient's virilization. There is little information on success rates with ovulation induction in the rare premenopausal women with Ovarian hyperthecosis who desires fertility. However, pregnancy rates are likely to be very low due to factors such as obesity, abnormal ovarian architecture, and extremely high serum and intraovarian androgens. If ovulation induction is attempted, we suggest letrozole, the drug of choice for women with polycystic ovary disease. If unsuccessful, clomiphene can be tried. The treatment of hirsutism should be by local therapy, oral contraceptives, and anti - androgens.

4. Conclusion

This case study significantly contributes to the medical field by illuminating the diagnostic complexities and treatment responses of ovarian stromal hyperthecosis, a condition that mimics PCOS yet requires distinct management approaches. Such insights are crucial for enhancing clinical outcomes in similar presentations.

This case of ovarian stromal hyperthecosis exemplifies the clinical and diagnostic challenges posed by this rare condition. Despite resembling PCOS, its unique presentation and response to treatment underscore the necessity for heightened awareness and research into its pathophysiology and management. Surgical intervention remains a crucial treatment modality, highlighting the importance of considering ovarian hyperthecosis in differential diagnoses of hyperandrogenic disorders.

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