Journal of Health and Rehabilitation Research 2791-156X JHRR

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Original Article

Sertoli-Leydig Cell Tumour in a Patient with Ambiguous Genitalia and Congenital Adrenal Hyperplasia

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Conflict of Interest: None.

Aslam M., et al. (2024). 4(2): DOI: https://doi.org/10.61919/jhrr.v4i2.825

ABSTRACT

Background: Hyperandrogenism, characterized by elevated levels of male hormones such as testosterone, presents various clinical manifestations including secondary amenorrhea, hirsutism, and clitoromegaly. While often associated with polycystic ovarian syndrome, other differentials such as Sertoli-Leydig cell tumors and Congenital Adrenal Hyperplasia (CAH) are critical to consider. These conditions can manifest at different life stages and are seldom seen together.

Objective: This case study aims to explore the rare co-presentation of CAH and a Sertoli-Leydig cell tumor in a patient presenting with secondary amenorrhea and ambiguous genitalia, and to discuss the diagnostic challenges and management strategies involved.

Methods: A 16-year-old female presented with irregular menstrual cycles and secondary amenorrhea, alongside symptoms of hyperandrogenism such as voice deepening and hirsutism. Diagnostic procedures included physical examinations, ultrasound imaging, and hormone level assessments. A detailed ultrasound revealed a large right-sided ovarian mass, and biopsies confirmed a Sertoli-Leydig cell tumor. Surgical intervention involved the excision of the mass, with subsequent histopathological examination. The patient underwent three cycles of chemotherapy and was scheduled for reconstructive surgery.

Results: Ultrasound dimensions of the ovarian mass were 7.2 x 13.4 x 16 cm, with the post-surgical tumor measuring 18 x 17 cm. Laboratory findings included testosterone levels above 200 ng/ml, and elevated alpha-fetoprotein levels. The histopathological report confirmed a poorly differentiated Sertoli-Leydig cell tumor (FIGO stage 1a). Post-treatment follow-up showed a marked reduction in androgen levels and stabilization of the patient's menstrual cycle.

Conclusion: The coexistence of CAH and a Sertoli-Leydig cell tumor presents unique diagnostic and therapeutic challenges. This case emphasizes the importance of a thorough evaluation and a multidisciplinary approach in the management of complex hyperandrogenic states to achieve optimal clinical outcomes.

Keywords: Hyperandrogenism, Sertoli-Leydig cell tumor, Congenital Adrenal Hyperplasia, secondary amenorrhea, ovarian tumor, testosterone, chemotherapy, gynecological oncology.

INTRODUCTION

Hyperandrogenism, a clinical syndrome characterized by elevated levels of male hormones, particularly testosterone, manifests in various forms including secondary amenorrhea, hirsutism, and clitoromegaly (1). While the most common etiology is polycystic ovarian syndrome (PCOS), other differential diagnoses such as Sertoli-Leydig cell tumors and Congenital Adrenal Hyperplasia (CAH) warrant careful consideration (2). These conditions can manifest from birth or emerge during late adolescence or adulthood, with the onset and severity of symptoms playing a critical role in guiding the differential diagnosis process. The simultaneous occurrence of multiple etiologies, such as CAH and ovarian tumors, although rare, presents a unique clinical challenge requiring a nuanced approach to diagnosis and management (3-9). In this case study, we explore a distinctive instance where a patient presented with secondary amenorrhea and ambiguous genitalia, leading to a dual diagnosis of CAH and a Sertoli-Leydig cell tumor, illustrating the complexities involved in diagnosing and treating overlapping syndromes of hyperandrogenism.

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MATERIALS AND METHODS

A 16-year-old girl presented with a six-month history of irregular menstrual cycles and a three-month duration of secondary amenorrhea. She reported no intermenstrual bleeding or dysmenorrhea. Symptoms such as perineal heaviness, voice deepening, and hirsutism had been developing over the previous four months. During the clinical examination, a significant 20-week-sized, globular-shaped abdominal mass extending to the umbilicus was noted, along with clitoromegaly, but no other abnormalities were observed in the external genitalia.

Diagnostic imaging was performed using ultrasound, which identified a large right-sided ovarian mass. To ascertain the nature of the mass, two ultrasound-guided biopsies were conducted, obtaining tissue samples for histological analysis. Comprehensive laboratory testing was carried out, revealing elevated levels of alpha-fetoprotein and testosterone, while carcinoembryonic antigen, lactate dehydrogenase, and CA125 levels were found to be within normal ranges. An increase in 17 hydroxylase levels was also noted, suggesting altered steroidogenesis.

Genetic analysis through karyotyping was conducted to check for any chromosomal abnormalities, with results showing no anomalies. The patient underwent a surgical procedure to remove the tumor, which involved excising a large mass that had engulfed the right ovary and fallopian tube, although the uterus and the left ovary and tube were preserved. The excised tumor was then subjected to histopathological examination, confirming it as a poorly differentiated Sertoli-Leydig cell tumor, classified as FIGO stage 1a based on its extent and nature.

All procedures adhered to the ethical standards set by the responsible committee on human experimentation, both institutional and national, and were in compliance with the Helsinki Declaration of 1975, as revised in 2008. Data from the clinical findings, imaging studies, laboratory tests, and histopathological reports were collated and analyzed to confirm the diagnosis and plan the treatment strategy.

RESULTS

Postoperative management included three cycles of chemotherapy with Bleomycin, Etoposide, and Platinum for tumor control, with a planned six-month follow-up for cosmetic surgery to address the clitoromegaly.

Table 1: Summary of Key Clinical and Laboratory Findings

Clinical/Lab Parameter	Measurement/Value	Normal Range	Remarks
Menstrual Cycle Regularity	Irregular	Regular	Last 6 months prior to presentation
Testosterone Level	>200 ng/ml	15-70 ng/ml	Significantly elevated
Alpha-fetoprotein (AFP)	Elevated	0-8 ng/mL	Indicator of tumor presence
Ultrasound Dimensions	7.2 x 13.4 x 16 cm	N/A	Right-sided ovarian mass
Tumor Size (Surgical)	18 x 17 cm	N/A	Post-operative measurement
CA-125	Normal	0-35 U/mL	Within normal range
17 Hydroxylase Levels	Elevated	Normal	Indicates enzyme activity in steroidogenesis
Karyotyping	Normal	Normal	Chromosomal analysis

The presence of hyperandrogenism was primarily attributed to the tumor and CAH, necessitating an integrated approach to treatment encompassing gynecological, endocrinological, and psychiatric care.

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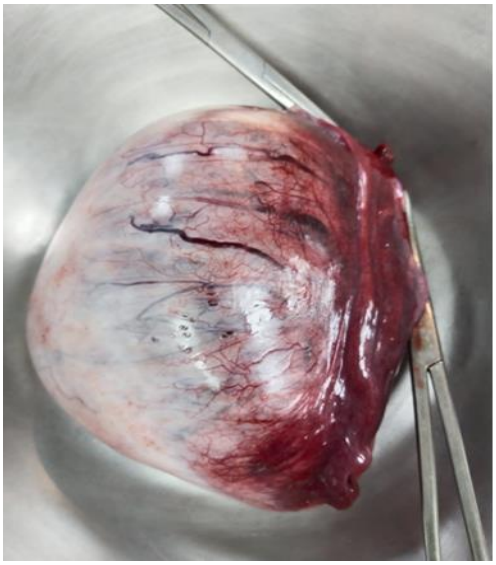

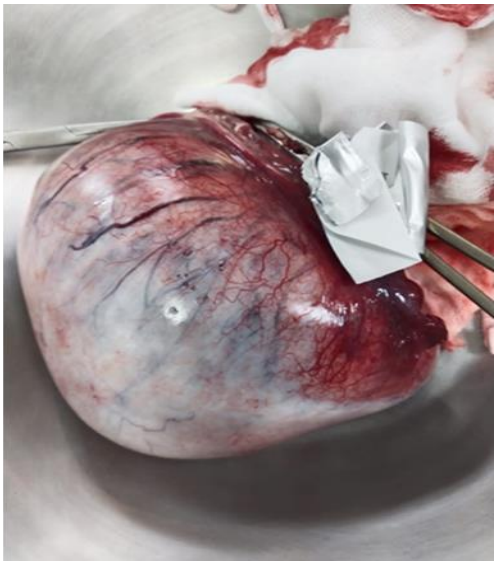

Figure 1 Surgical Removal of Ovarian Mass; Left: Initial presentation of the excised ovarian mass, showcasing its size and surface vasculature. Right: Detailed view of the mass post-excision, highlighting the vascular structure and surgical markings

DISCUSSION

The hyperandrogenic state in women, often signaled by hirsutism, is predominantly caused by polycystic ovarian syndrome (1). Sertoli-Leydig cell tumors, rare ovarian neoplasms accounting for less than 0.1% of cases, typically present with virilization and oligomenorrhea or amenorrhea among other signs (2, 3). These tumors are generally confined to a single ovary, allowing for fertility-sparing procedures like unilateral oophorectomy in younger women (9, 10). Advanced cases may require neoadjuvant chemotherapy (11, 12). The simultaneous occurrence of CAH with ovarian tumors, although rare, involves various primary tumors such as steroid cell tumors and ovarian adrenal rest tumors (14). It is hypothesized that hyperandrogenism from CAH leads to increased peripheral aromatization of androgens to estrogen, stimulating ovarian tissue growth through elevated LH levels (15).

As part of reflective practice it described in the following paragraphs to analyze the care provided to the patient with hyperandrogenism due to both Congenital Adrenal Hyperplasia (CAH) and a Sertoli-Leydig cell tumor. The patient, a 16-year-old female, presented with symptoms of secondary amenorrhea and ambiguous genitalia, eventually diagnosed with CAH and a Sertoli-Leydig cell tumor. Diagnostic procedures included detailed ultrasounds and hormonal assessments, culminating in surgical intervention and chemotherapy. Initially, the complexity of the patient's presentation evoked a sense of urgency and the need for meticulous attention to ensure no underlying conditions were overlooked (16-18). The dual diagnosis was challenging but also a learning opportunity to manage multiple intricate conditions concurrently. The treatment was comprehensive, involving multiple specialties. However, the psychological impact on the patient, considering her age and the conditions' implications on her physical appearance and fertility, could have been addressed more thoroughly in the initial counseling sessions (19).

The case highlights the importance of considering rare diagnoses in hyperandrogenism and underscores the necessity of a multidisciplinary approach. The use of ultrasound and biopsies effectively led to the correct diagnosis. Yet, the case raises questions about the timing of psychological support and its integration into the treatment plan. The clinical management successfully addressed the physical health conditions. However, the reflection underscores the need to integrate psychological support early in the treatment process, especially for adolescents dealing with complex health issues affecting their body image and future reproductive choices (18).

For future similar cases, it would be beneficial to: Integrate a psychologist or counselor into the treatment team from the outset to support the patient through the diagnosis and treatment phases, develop a checklist or protocol that ensures all patients with similar presentations are automatically given an option for psychological evaluation and enhance patient education and involvement in decision-making about their treatment options to empower them and address any concerns related to fertility and long-term outcomes (20).

CONCLUSION

This case underscores the complexity of diagnosing and managing hyperandrogenism due to dual etiologies of CAH and an ovarian tumor. The integrative treatment approach highlights the need for comprehensive care addressing multiple specialties to ensure holistic patient management. Further studies are needed to explore the link between CAH and ovarian tumor development to refine treatment protocols and improve patient outcomes.

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