Acute Abdomen, Primary Amenorrhea, Juvenile Hypothyroidism: A Rare Combination

ABSTRACT
Ovarian cysts are common causes for gynecological surgery. Juvenile hypothyroidism, multiple large ovarian cysts causing acute abdomen and primary amenorrhea are infrequently reported and not widely recognized. We report a case of a 21-year-old lady who presented with juvenile hypothyroidism, primary amenorrhea, multiple cystic ovary and raised thyroid stimulating hormone (TSH), follicle stimulating hormone (FSH) and estradiol levels. After thyroid replacement, regression of TSH, FSH levels and cyst size were noted. Laparotomy done in view of torsion of ovary, histopathology (HPE) revealed multicystic ovary. This case was reported for its unusual presentation of hypothyroidism leading to torsion ovary.

Keywords: Juvenile hypothyroidism, Multicystic ovary, Primary amenorrhea.

CASE REPORT
A 21-year-old single woman presented with complaints of abdominal discomfort and distension for 1 month and primary amenorrhea. One month prior to admission, she noticed abdominal distention and vague abdominal pain. Patient has no history suggestive of anosmia, visual disturbances, headache, loss of weight appetite, childhood infections or prior chemo or radiotherapy. Mother attained menarche at 16 years. Medical and surgical history were otherwise unremarkable.

Initial investigations are summarized in Table 1. Hemogram, liver and renal function tests were normal. TSH—> 150, FSH—67 μ/ml and estradiol—2230 pg/ml and markedly low LH—0.07 μ/ml and FT4 levels. CA125 and other tumor markers like LDH, alpha fetoprotein and beta-hCG were normal. Karyotyping done showed 46, xx female karyotype USG pelvis revealed a mass in the right adnexa 12 × 8 cm with dense internal echoes like effect. Thyroid stimulating hormone could serve as a facilitating factor in the development of multiple follicular cysts.

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INTRODUCTION
Massive ovarian enlargement, multicystic ovaries, ovarian hyperstimulation and amenorrhea have all been linked to hypothyroidism. Failure to recognize hypothyroidism as an etiology of ovarian cysts could lead to inadvertent oophorectomy. It has been recently shown that thyroid stimulating hormone (TSH) could interact with follicle stimulating hormone (FSH) receptors to elicit gonadal stimulation because through specificity spill over TSH could have an FSH and luteinizing hormone (LH)
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(Fig. 1), minimal vascularity seen, uterus and left ovary were normal, minimal free fluid was seen. Computed tomography scan (Fig. 2) showed large multiloculated cyst lesion of size $13 \times 8 \times 6$ cm seen in the right adnexa extending up to the lower abdomen. Multiple enhancing septa are seen, right ovary was not visualized separately and left ovary was normal. Minimal fluid seen in lower abdomen. Three hypodense lesions largest of size $1.4 \times 1.2$ cm seen in the right lobe of liver. A differential diagnosis of (1) cyst adenocarcinoma of right ovary with, (2) hemorrhagic metastasis in liver was made. ECG and Echo were normal X-ray of left wrist for bone age showed less than 15 years but greater than 11 years.

The patient was started on levothyroxine 125 mcg. She had vaginal bleeding 1 week after starting thyroxine treatment. Three weeks later, after treatment with thyroxine, there was drastic decline in TSH to 14.78, FSH to $< 0.03 \mu m$ and Sr estradiol to 30.6 pg/ml (Table 1).

A repeat ultrasound done after 4 weeks showed decrease in tumor size $12 \times 8$ cm to $9 \times 6$ cm. Patient developed signs of acute abdomen with suspected torsion, taken up for laparotomy.

Intraoperatively (Fig. 3), the right ovary was enlarged $9 \times 8$ cm, torsion four times seen near right pedicle, specimen with areas of hemorrhage, congestion and stromal edema noted (Fig. 4). The left ovary and uterus were normal. Frozen section showed benign lesion with extensive areas of hemorrhage, congestion and stromal edema consistent with torsion, histopathology was reported as benign multiloculated cyst (Fig. 5).

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**Fig. 1:** Ultrasonography of abdomen right adnexa mass $12 \times 8$ cm with dense internal echoes and minimal vascularity

**Fig. 2:** Coronal section of CT showing large multiloculated cyst $13 \times 8 \times 6$ cm in right adnexa extending up to lower abdomen, multiple septa seen. Three hypodense lesions in right lobe of liver seen

**Fig. 3:** Right ovary with torsion

**Fig. 4:** Cut section of right ovary

**Fig. 5:** Histopathology showing multiloculated cysts
DISCUSSION

The salient features of longstanding juvenile hypothyroidism include deficient linear growth, delayed puberty.6 The syndrome consisting of primary hypothyroidism, precocious puberty and massive ovarian cysts was termed Van Wyk and Grumbach syndrome in 1960.7 Several hypotheses about the mechanism of ovarian cyst formation associated with hypothyroidism have been proposed.

Firstly structural similarities between TSH, FSH, and their receptors may have some role. Extremely high levels of TSH can bind to FSHR and lead to activation of follicular cells (specificity spill over phenomenon). A second explanation is changes in the gonadotropins. Patients with hypothyroidism may have relatively high FSH levels and low LH levels. Hypothyroidism is associated with slow GnRH pulse, slow GnRH pulse favor FSH production and secretion, whereas rapid frequency favor LH production.9,10 Regression of both pituitary and ovarian cyst after administration of thyroid hormone has been reported.11 Hypothyroidism is associated with functional ovarian hyperstimulation like syndrome. Spontaneous OHSS related with pregnancy has been described as depending on activating mutations of the FSH receptor (FSHR) gene, causing ovarian hyper-responsiveness to circulating FSH or even cross-responsiveness of FSHR to hormones having a structure similar to FSH, such as human chorionic gonadotropin (hCG) or TSH.12,13 Similar cases have been reported from 2001 to 2008 as shown in Table 2 but this case has the highest FSH reported and estradiol levels that drastically declined with thyroxine therapy. This case report illustrates that health providers should have a high suspicion for hypothyroidism in patients with multiple ovarian cysts, these symptoms can be completely reversed with initiation of thyroid replacement, avoiding unnecessary surgery and anesthesia.

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<th>Author</th>
<th>Yamashita</th>
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<td>Morpho of ovary</td>
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<td>Multiple cysts right 6 cm, left 5 cm</td>
<td>Multiple cysts right 10 cm, left 4 cm</td>
<td>Multiple cyst 12 × 8 cm</td>
</tr>
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</table>

CONCLUSION

Multicystic ovaries, as a presenting feature of juvenile hypothyroidism, are rare. Appropriate diagnosis and thyroid replacement therapy is effective and prevents inadvertent surgery. The time course for regression of multicystic ovaries with thyroid replacement varies between 3 and 6 months in most case studies.10,11 Serum TSH should be measured in every adolescent with menstrual irregularities.

REFERENCES


