



ORIGINAL ARTICLE

Hemorrhagic ovarian cysts: Clinical and sonographic correlation with the management options



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Abstract *Background:* Hemorrhagic ovarian cysts (HOCs) are commonly seen in clinical practice. Most of them disappear spontaneously with follow-up except in minority of cases in which surgical intervention is stated. Our aim in this study was to review the cases diagnosed as having HOCs in our hospital and clarify the clinical and sonographic features of both surgically and conservatively managed patients. *Materials and methods:* Forty-eight patients who had been diagnosed as having HOCs were enrolled in this retrospective study divided into 2 groups: the first was surgically managed after hospitalization and the other managed conservatively with follow-up. Clinical and sonographic features with management options of both groups were reviewed. *Results:* Out of 48 patients, 16 patients (33.3%) underwent a surgical procedure, and 32 (66.7%) managed conservatively. The two groups were comparable regarding clinical features. The sonographic features revealed that the mean volume of HOCs was 65.7 ml and the mean length of their greatest diameters was 4.8 cm. There was significant difference between both groups, as the values in surgical group were significantly greater than those in the conservative group ($P < 0.05$). According to the sonographic morphological pattern of HOCs, 8 cases (16.7%) showed a diffuse dense echo pattern mimicking a solid mass, 25 cases (52.1%) showed a sponge like pattern and 15 cases (31.2%) displayed a mixed cystic–solid pattern. *Conclusion:* Clinical, laboratory and ultrasound features of patients with HOCs can guide the gynecologists to the optimum management of such cases avoiding unnecessary surgery.

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1. Introduction

Hemorrhagic ovarian cyst (HOC) is an adnexal mass formed because of occurrence of bleeding into a follicular or corpus luteum cyst (1). Hemorrhagic cysts are commonly seen in clinical practice because hemorrhage into a cyst is usually painful,

triggering the patient to consult her physician. They can present with variable clinical symptoms and signs ranging from no symptoms up to acute abdomen.

HOCs are commonly detected by gray-scale ultrasound, but they are often misdiagnosed due to their variable sonographic appearance; mimicking other organic adnexal masses. Most of HOCs are functional, few of them can be neoplastic but they are universally benign (2). Surgical intervention should be deferred in the management of HOCs as most of them disappear spontaneously with follow-up, so confident clinical and sonographic diagnosis should be attempted to avoid exposing the patient to unnecessary surgery (3).

Surgical intervention may be indicated in cases of large cysts greater than 5 cm in diameter, severe persistent abdominal pain, failure of the cyst to resolve spontaneously, masses that cannot be confirmed to be benign by ultrasound criteria and finally occurrence of complications such as rupture and ovarian torsion (4).

2. Aim of the study

In our study, we reviewed the cases diagnosed as having HOCs in our hospital to clarify the clinical and sonographic features of both surgically and conservatively managed patients and determine how those features could help in avoidance of unnecessary surgery in patients with HOCs.

3. Materials and methods

Forty-eight patients diagnosed as having HOCs were enrolled in this retrospective study. We reviewed the files of patients at Woman's Health Center, Assiut, Egypt for 1 year between the first of November 2013 and the 31st of October 2014. The study was approved by the Ethical Review Board of Assiut faculty of medicine.

The patients were classified into 2 groups. Group (A) included 16 cases, presented with acute abdomen, surgically managed after hospitalization. Group (B) included 32 cases, who had no symptoms or mild pain; conservatively managed with weekly follow-up by ultrasound. Clinical, laboratory, sonographic and Doppler findings of both groups were analyzed and compared. Age, parity, menopausal status, presence of current pregnancy, detection phase of the menstrual cycle, follicular or luteal, body mass index, white blood cells (WBCs) count, Hemoglobin level (Hb) and duration of persistent abdominal pain were recorded.

Sonographic findings were obtained focusing on the maximum diameter of the cyst, volume, and morphological pattern being classified into one of three patterns (solid type, sponge like type, and mixed cystic–solid type) (5).

After sonographic evaluation, the color Doppler results were obtained to assess the vascularization of the cyst. A subjective semiquantitative assessment of the amount of blood flow within the examined lesion (color score) was used (6). The amount of blood flow within the cyst was scored as follows: if there is no blood flow detected, a score of 1 was given; if minimal blood flow, a score of 2 was given; a score of 3 was given when moderate flow was present, and a score of 4 was given if the cyst appeared highly vascularized with marked blood flow. Resistance index (RI) and Pulsatility index (PI) were taken for each cyst.

The management according to their clinical condition was reported by either conservative management or surgical intervention.

For patients in group (A), surgical approach (laparoscopy or laparotomy) and procedure (cystectomy or oophorectomy) were recorded. Also, histopathological results were reviewed to confirm their nature.

For patients in group (B), the results of weekly follow-up by ultrasound recording any change in the mass parameters (diameter, morphological pattern) or occurrence of complications such as rupture or torsion and finally disappearance of the cysts were obtained.

Analysis of data was done using SPSS Inc., (Statistical Program for Social Science Inc.) Chicago, IL, USA, version 16. Qualitative variables were expressed as frequency and percentage. Chi-square test was used to compare qualitative variables. Quantitative variables were presented in terms of mean, standard deviation and range. For quantitative data, comparison between two groups was done using Student's *t*-test. Level of significance "*P*" value was evaluated, where *P* value < 0.05 was considered statistically significant.

4. Results

In the study period, 48 patients were evaluated. Sixteen patients (33.3%) underwent a surgical procedure, and 32 (66.7%) expectantly managed with observation for eventual resolution of the cyst.

The mean age of patients included in the study was 28.1 years (range 15–50 years). All of patients (100%) were in the reproductive age; no one was in the premenarche or postmenopausal period. Flowchart of the studied patients is given in Fig. 1.

Table 1 shows the clinical and laboratory findings in both groups of patients diagnosed with HOCs. There is no significant difference between both groups as regards age, parity or BMI. The frequency of HOCs in multiparous patients (56.3%) was greater than that in nulliparous cases (43.7%). There were many cases detected in the luteal phase ($n = 33$, 68.8%) in comparison with the follicular phase ($n = 4$, 8.3%) with significant difference between both groups. Eleven cases were detected during first trimester of pregnancy (22.9%) and all of them were managed conservatively. The mean WBCs count for group B was significantly lower than that for group A ($P < 0.05$) while the mean hemoglobin level for group A was significantly lower than that for group B ($P < 0.05$).

Analysis of the ultrasound findings revealed that the mean volume of HOCs was 65.7 ml and the mean length of their greatest diameters was 4.8 cm. There was significant difference between both groups, as the values in group A were significantly greater than those in group B ($P < 0.05$). Blood flow inside the cysts was analyzed by color Doppler; 39 cysts show mild flow in the wall, while nine were avascular with no significant difference between the two groups. In addition, no significant difference was found in the mean PI and RI values of arteries in the evaluated cysts between both groups (Table 2).

According to the sonographic morphological pattern of HOCs, 8 cases (16.7 %) showed a diffuse dense echo pattern mimicking a solid mass, 25 cases (52.1%) showed a sponge like pattern and 15 cases (31.2%) displayed a mixed cystic–solid

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