Emergency laparoscopy for suspected ovarian torsion: are we too hasty to operate?

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Objective: To reevaluate the rate of correct diagnosis of ovarian torsion (OT) in our department.
Design: Retrospective computerized chart review.
Setting: Tertiary referral center.
Patient(s): Seventy-eight women who underwent laparoscopy for suspected OT.
Intervention(s): Laparoscopy.
Main Outcome Measure(s): Rate of true diagnosis of torsion, correlation with Doppler studies.
Result(s): The preoperative diagnosis of OT was confirmed in only 36 (46.1%) of the patients. Immediate operation (<10 hours) after admission (n = 48) was associated with a statistically significantly higher likelihood of operatively confirming OT (56.2% vs. 28.6%). We found that the lack of ovarian blood flow on Doppler sonography was a good predictor of OT; women with pathologic flow were statistically significantly more likely to have OT (77% vs. 29%). The sensitivity and specificity of abnormal ovarian flow for OT were 43.8% and 91.7%, respectively, with a positive and negative predictive value of 78% and 71%, respectively.
Conclusion(s): Despite 20 years of research, the accuracy of the preoperative diagnosis of OT remains low. The urge to operate can be attributed to the importance of preserving ovarian function in young women as well as to the availability and the low associated complication rate of laparoscopy. (Fertil Steril® 2010;93:2012–5. ©2010 by American Society for Reproductive Medicine.)

Key Words: Preoperative diagnosis, ovary, torsion, emergency laparoscopy, adnexa

Ovarian torsion (OT) is a severe gynecologic emergency with a yearly prevalence of 2.7% to 3.0% (1–3). Prompt diagnosis and surgery may prevent irreversible adnexal damage, but OT remains one of the most challenging diagnoses in the emergency room. The clinical symptoms of OT are nonspecific. Adnexal torsion occurs most often in adolescent girls and in women of childbearing age (4), nearly all of whom desire future fertility. Delay in diagnosis and treatment of OT may therefore have grave consequences, resulting in functional loss of the ovary. Since 1989, we have advocated for routine treatment of all patients with twisted ischemic adnexa by urgent detorsion, not by salpingo-oophorectomy (5–7). Animal studies have shown that prompt diagnosis and treatment is essential for ovarian preservation and future fertility (1).

The accuracy of diagnosis in 100 emergency laparoscopies performed due to acute abdomen in nonpregnant women was previously assessed in our department (8). In that study, the preoperative diagnosis was correct in only 29 (44%) of 66 women operated on for suspected OT. Other studies have similarly demonstrated a disappointingly low rate of accurate preoperative prediction of OT (9, 10). Ultrasonography has advanced immensely in recent years but with apparently no improvement in the accuracy of the preoperative diagnosis of OT (11). The ultrasonographic appearance of ovarian torsion varies according to the duration and degree of torsion, complete or incomplete, and the presence or absence of an ovarian mass (12, 13). Sonographic findings that have been previously described as predictors of OT include the appearance of a cystic, solid, or complex mass, adnexal location that is cranial to the uterine fundus, thickening of the adnexal wall, unilateral ovarian enlargement with multiple peripherally located follicles, and cystic hemorrhage (11). Detection rates of only 46% to 74% have been reported.

Doppler studies have been reported as a promising tool for the diagnosis of OT (14, 15). A recent study showed that, in 39 women with pathologically proven OT, arterial flow was found in 54% and venous flow in only 33% (11). The investigators recommended that Doppler flow studies should not delay surgical exploration in the setting of suggestive signs and symptoms.

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Despite several attempts (8, 16), no serum markers have been shown so far to be clinically effective in increasing the accuracy rates of preoperative diagnosis of OT.

Our study was evaluated the accuracy of the preoperative diagnosis of OT in women undergoing urgent laparoscopy for suspected OT. We hypothesized that the accuracy rate of the preoperative diagnosis of OT has improved in view of the large clinical experience gained in our department and the advances and better availability of imaging techniques.

MATERIALS AND METHODS

A retrospective computerized chart review was conducted at Israel's largest tertiary referral center. The computerized medical records program used in our medical center was Clinic-Care (Clinic-Care, Ness Technologies, Tel Aviv, Israel).

Charts of all women undergoing laparoscopy from November 1, 2006, to February 28, 2008, were reviewed. Only women who underwent laparoscopy for suspected OT were included in our study. A single investigator (SB) reviewed each chart and abstracted the data. Another investigator (RM) was consulted regarding inclusion of patients' data in the study whenever a question arose, and also reviewed the extracted data and 10 charts to assess the inter-rater variability.

Ultrasonographic findings were recorded from two separate sources: patient's admission and department charts, and examination results from the department's Ultrasound Unit. In cases of mismatch, the information from the patient's chart was included because it had a stronger influence on the physician's diagnoses and decisions. Finally, operative findings were reviewed and documented. Times of admission and operation were recorded in the admission and surgical notes, respectively (the medical file program automatically marks the time when charts are written).

Statistical Analysis

Statistical analyses were performed using SAS statistical software (version 9.1, SAS Institute, Inc, Cary, NC). Categorical variables are presented as percentage and continuous variables are presented as mean ± standard deviation. Comparison of variables was performed by chi-square test for categorical variables and by Wilcoxon rank sum test for continuous variables. Two-sided $P<.05$ was considered statistically significant. No power analysis was performed as this was a convenience sample that included all cases performed since the completion of our previous study.

The study was approved by the institutional review board of the Sheba Medical Center.

RESULTS

Seventy-eight women underwent laparoscopy in our department for suspected OT during the study period. In 36 (46.1%) of the patients, the preoperative diagnosis of OT was confirmed, and laparoscopic adnexal detorsion was immediately performed. In 11 cases (15.7%), no pathology was found. Pathologic surgical findings are listed in Table 1. No operative or postoperative complications were noted.

At the time of the operation, 51 women (68%) were married. Average gravidity and parity were 1.5 and 0.9, respectively. Twenty women (25.6%) had undergone ovarian stimulation for infertility during or immediately before their admission. Nineteen (24.4%) of the women were pregnant and 13 (18.1%) smoked. Thirty women (38.5%) reported having a recent previous event of pain, and 38 (48.7%) had previously sought medical advice for pain or for an ovarian cyst. An ovarian cyst was diagnosed before the current event in 25 (32.0%) women. Thirty-seven women (47.4%) had previously undergone one or more abdominal surgeries before admission, of which 13 (35.1%) were ovarian detorsion.

The presenting signs and symptoms are listed in Table 2. Seventy-seven women (98.7%) underwent ultrasonographic studies before surgery. An ovarian cyst or mass was diagnosed preoperatively in 66 (85.7%) patients. Six of the 11 women who preoperatively were not found to have an adnexal mass were diagnosed with OT during laparoscopy. No correlation was found between adnexal or cyst size and torsion.

Ovarian blood flow was assessed by color Doppler sonography in 40 women (51.2%). In 31 cases (77.5%), it was found to be normal. Nine (29%) of those had OT. In nine cases (22.5%), ovarian flow was found to be "pathological" or absent. Seven of those (77%) had OT. This difference was found to be statistically significant ($P=.0175$). The sensitivity and specificity of abnormal ovarian flow for OT was 43.8% and 91.7%, respectively, with a positive and negative predictive value of 78% and 71%, respectively. In nine cases (11.7%), ovarian edema was noted on ultrasonographic scan, and six (66.6%) of those patients had OT.

The average time from admission to operation was 11.4 hours (range: 0.5 to 60.0). The average time from the decision to operate to the operation was 3.59 hours (range: 0.5 to 20.0). Forty-eight women were operated on within 10 hours after admission. Of those, 27 (56.2%) had OT. Twenty-eight women were operated on more than 10 hours after admission, and eight (28.6%) had OT. This difference was found to be statistically significant ($P=.031$).

Eighteen of the women who were operated on more than 10 hours after admission underwent ultrasound flow studies. In 16 (88.8%) of those studies, normal flow was demonstrated, and in two (11.1%) pathological flow was found. Among women operated on within 10 hours from admission, normal flow was demonstrated in 15 (88.2%), and pathological flow was demonstrated in two (11.7%). The difference between the two groups was not statistically significant ($P=1.0$).

DISCUSSION

The primary finding of our study was that women who underwent laparoscopy for suspected OT were correctly diagnosed