

Diagnosis of Ovarian Torsion: Is It Time to Forget About Doppler?



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Abstract

Objective: Accuracy of ultrasound in diagnosis of ovarian torsion remains controversial, with some studies reporting correct diagnosis in only 23% to 66% of cases. Normal Doppler flow does not necessarily exclude an ovarian torsion; in fact, it may lead to missing the diagnosis and has been shown to delay management. The objective of our study was to assess sensitivity and specificity of ultrasound diagnosis of ovarian torsion and to analyze the factors contributing to correct and incorrect diagnosis.

Methods: All women presenting with abdominal pain and admitted for urgent/emergent surgery to the gynaecology service at a major teaching hospital between September 2010 and August 2015 were reviewed. Of those, 55 cases of surgically proven ovarian torsion and 48 control cases were selected. Ultrasound reports were reviewed and analyzed.

Results: Sixty-one percent of right ovarian torsion case and 27% of left ovarian torsion cases had normal Doppler flow. Presence of ovarian cysts was significantly associated with torsion. Sensitivity of ultrasound was 70% and specificity was 87%.

Conclusion: While ultrasound can be used to support a diagnosis of ovarian torsion, it is a clinical diagnosis that requires integration of many factors, especially patient presentation and exclusion of other non-gynaecological pathologies. Doppler flow is not a useful variable to diagnose or exclude ovarian torsion and we recommend it should not be used to exclude a diagnosis of ovarian torsion.

Résumé

Objectif : La fiabilité de l'échographie dans le diagnostic de la torsion ovarienne ne fait pas l'unanimité; certaines études font état de diagnostics corrects dans 23 % à 66 % des cas seulement. Un flux sanguin normal au Doppler n'exclut pas nécessairement la possibilité de torsion ovarienne; en fait, ce résultat peut mener à un faux diagnostic négatif et ainsi retarder la prise en charge.

Key words: Ovarian torsion, ultrasonography Doppler, pelvic pain

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Cette étude visait à évaluer la sensibilité et la spécificité de l'échographie dans le diagnostic de la torsion ovarienne et à analyser les facteurs contribuant à l'établissement d'un bon et d'un mauvais diagnostic.

Méthodologie : Nous avons passé en revue toutes les femmes présentant une douleur abdominale admises dans un grand hôpital universitaire pour subir une chirurgie gynécologique urgente entre septembre 2010 et août 2015. Nous avons ensuite sélectionné 55 femmes chez qui la torsion ovarienne a été prouvée chirurgicalement et 48 cas témoins. Les rapports d'échographie ont été examinés et analysés.

Résultats : Soixante et un pour cent des cas de torsion ovarienne droite et vingt-sept pour cent des cas de torsion ovarienne gauche présentaient un flux sanguin normal au Doppler. La présence de kystes ovariens était fortement associée à la torsion. La sensibilité de l'échographie était de 70 % et sa spécificité, de 87 %.

Conclusion : Même si l'échographie peut appuyer un diagnostic de torsion ovarienne, l'établissement de ce dernier nécessite la prise en compte de plusieurs facteurs, notamment le tableau clinique de la patiente et l'exclusion d'autres pathologies non gynécologiques. Le flux sanguin au Doppler n'est pas une variable utile pour diagnostiquer une torsion ovarienne ou écarter cette possibilité; nous recommandons donc de ne pas l'utiliser à ces fins.

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BACKGROUND

Ovarian torsion is the fifth most common gynaecologic surgical emergency.¹ Early diagnosis is important to prevent loss of adnexa or ovary.

Diagnosis is difficult because clinical presentation of ovarian torsion is variable and physical examination often nonspecific. The only consistent symptom is abdominal pain usually localized to lower quadrant.²

Accuracy of ultrasound in diagnosis of ovarian torsion remains controversial. For example, one study found that

the preoperative diagnosis of ovarian torsion was confirmed in only 46.1% of the patients who had suspected ovarian torsion.³ Suggested factors impacting diagnostic accuracy are professional heterogeneity of ultrasound operators and differences in extent of sonographic evaluation.⁴

Factors that have been found to be associated with ovarian torsion include: ovarian edema with peripherally placed follicles, relative enlargement of ipsilateral ovary, free fluid around ovary or in Douglas pouch, ovarian cyst, abnormal ovarian location, and “whirlpool sign” of a twisted vascular pedicle.^{5,6}

Of these factors, one study found that only free fluid and abnormal blood flow were found to be statistically significantly more frequent in cases of ovarian torsion than in controls.⁴

Another study confirmed that lack of blood flow on Doppler sonography was a good predictor of ovarian torsion, with women with pathological flow statistically more likely to have ovarian torsion (77% vs. 29%). However, the sensitivity of abnormal blood flow in predicting ovarian torsion is low, whereas the specificity is relatively high—43.8% and 91.7%, respectively—with a positive and negative predictive value of 78% and 71%, respectively.³

In a different study, ovarian enlargement and absence of ovarian venous Doppler flow were the most frequently shown clinical and sonographic indicators of ovarian torsion. However, ovarian enlargement, even in the presence of arterial and venous Doppler flow, is the most commonly associated sonographic finding. They showed that of the 39 women with pathologically proven ovarian torsion, arterial flow was found in 54% and venous flow in only 33%. The authors concluded that suspicion of ovarian torsion should be high in the setting of clinical symptoms and ovarian enlargement regardless of the presence or absence of an ovarian Doppler signal.⁷

Pena et al.⁸ also showed similar findings. They found that Doppler sonographic findings were normal in 60% of ovarian torsion cases (6 of 10 cases). Furthermore, for those with abnormal Doppler, the time to diagnosis of ovarian torsion and the time to hospital discharge were both decreased when compared with instances when normal flow was detected by Doppler sonography. They concluded that while Doppler sonography can be predictive of adnexal torsion, when normal flow is detected by Doppler sonography, it does not necessarily exclude an ovarian torsion; in fact, torsion is missed in 60% of cases, and time to diagnosis in these cases is delayed. One limitation of this study was the very small sample size.

The objective of our study was to assess sensitivity and specificity of ultrasound diagnosis of ovarian torsion and to analyze the factors contributing to correct and incorrect diagnosis. We hypothesized that ovary size and location will be the most specific variables for predicting ovarian torsion. We also hypothesized that Doppler findings will not be helpful in diagnosis of ovarian torsion.

METHODS

Study design and sample

Case control study design was used for sampling. All women presenting with abdominal pain and admitted for urgent/emergent surgery to the gynaecology service at the University of British Columbia major teaching hospital between September 2010 and August 2015 were reviewed. Of those, 55 cases of ovarian torsion as confirmed by surgical report and 48 controls were randomly selected. Controls included women with ovarian cysts +/- ruptured, endometriosis, pelvic inflammatory disease (PID), fibroids, and abdominal pain not yet diagnosed. Women with gynaecological malignancy, miscarriage, or ectopic pregnancy were excluded.

Variables

Diagnosis was confirmed based on surgical report. Ultrasound reports were analyzed for determination of final ultrasound diagnosis. Ultrasound reports were reviewed specifically for the presence of the following sonographic features:

1. Presence of ovarian mass/cyst.
2. Ovarian size to evaluate for unilateral ovarian enlargement.
3. Ovarian location.
4. Ovarian edema/location of follicles.
5. Free fluid.
6. Doppler—arterial/venous/location of Doppler.

While the protocol at our institution includes evaluation with transabdominal approach as well as transvaginal approach for evaluation of pelvic pain, and most of the studies likely were performed in this manner, we did not have complete data regarding technique if it was not mentioned specifically in the report and, thus, this variable was not controlled for.

Analysis

Frequency of the variables of interest were assessed in cases versus controls, and chi-square test was done to assess for significance. Sensitivity and specificity for ultrasound diagnosis of ovarian torsion were calculated.

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