



Original Article

Abdominal Ultrasound-Guided Transvaginal Myometrial Core Needle Biopsy for the Definitive Diagnosis of Suspected Adenomyosis in 1032 Patients: A Retrospective Study

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ABSTRACT **Study Objective:** To assess the results of abdominal ultrasound-guided transvaginal myometrial core needle biopsy (CNB) for the definitive diagnosis of adenomyosis.

Design: Retrospective study (Canadian Task Force classification II-3).

Setting: Private practice.

Patients: A total of 1032 consecutive premenopausal women aged 22 to 53 years who had undergone myometrial CNB and uterine-preserving surgery to treat adenomyosis, which was preliminarily diagnosed on the basis of symptoms and ultrasonographic findings.

Intervention: Transvaginal myometrial CNB under abdominal ultrasound guidance.

Measurements and Main Results: The mean age of the 1032 patients was 41.4 years (range, 22–53 years); 61% were aged 40 to 49 years, and 33% were aged 30 to 39 years. The mean Pictorial Blood Loss Assessment Chart (PBAC) score was 271.1, and total pain score was 11.79. The mean anterior myometrial thickness was 2.79 cm (range, 0.7–8.7 cm), and the posterior myometrial thickness was 3.72 cm (range, 1.1–9.4 cm). A total of 2596 myometrial tissue cores were obtained from thickened myometrium via abdominal ultrasound-guided transvaginal myometrial CNB. At histopathologic examination the tissue cores demonstrated adenomyosis in 2167, myometrial hypertrophy in 343, and leiomyoma in 86. Patients were classified into a concordant group (adenomyosis only, adenomyosis plus hypertrophy, and adenomyosis plus leiomyoma; $n = 951$) and a discordant group (hypertrophy and leiomyoma; $n = 81$), depending on conformance between the pathologic result and the preliminary ultrasonographic diagnosis. The study showed a 92.26% concordance rate of adenomyosis between the transvaginal myometrial CNB and ultrasonographic diagnoses. The mean number of tissue cores in the discordant ($n = 2.12$) and concordant ($n = 2.55$) groups differed significantly ($p < .05$).

Conclusion: Abdominal ultrasound-guided transvaginal myometrial CNB can be used in the definitive diagnosis of clinically and/or sonographically suspected adenomyosis in patients undergoing uterine-preserving surgery. Future research should focus on improving the definitive diagnostic rate of adenomyosis by using transvaginal myometrial CNB. Journal of Minimally Invasive Gynecology (2014) ■, ■–■ © 2014 AAGL. All rights reserved.

Keywords: Abdominal ultrasound-guided; Adenomyosis; Dysmenorrhea; Menorrhagia; Myometrial thickness; Transvaginal myometrial core needle biopsy

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Adenomyosis is a common gynecologic disease characterized by ectopic endometrial glands and stroma deep in the myometrium, and is frequently associated with hypertrophy and hyperplasia of the adjacent myometrium surrounding ectopic endometrial glands [1]. Menorrhagia and dysmenorrhea are the primary symptoms of adenomyosis, and most adenomyosis is associated with an enlarged globular uterus.

Adenomyosis has been treated primarily via hysterectomy, and is definitively diagnosed via histopathologic examination of the hysterectomy specimen. Considering the recent increase in the use of alternatives to hysterectomy (e.g., gonadotropin-releasing hormone agonists, myometrial reduction surgery, uterine artery embolization, endometrial ablation, and other uterine-preserving surgical procedures) for the treatment of adenomyosis, a substitute for the surgical biopsy has become necessary [2,3].

Recently, ultrasonography and magnetic resonance imaging (MRI) have been widely used in women with suspected adenomyosis. For transvaginal ultrasonography, sensitivity is 80% to 91.3% and specificity is 75% to 97.5% [4–12], and for MRI is 70% to 100% and 85% to 90.5%, respectively [8,13–16]. Ultrasonography and MRI are useful in the diagnosis of adenomyosis; however, these methods can yield only a suggestive, not a definitive, diagnosis.

Myometrial biopsy may be useful for histopathologic diagnosis of adenomyosis for performing uterine-preserving treatments, in the absence of hysterectomy. Many studies have investigated the use of myometrial needle biopsy via laparotomy or laparoscopy [17–20], transcervical electrosurgical loop biopsy, hysteroscopic biopsy using a loop electrode [21,22], percutaneous ultrasound-guided myometrial needle biopsy [3,18,23], and transvaginal myometrial core needle biopsy (CNB) using an automatic biopsy gun [2] as definitive diagnostic procedures; however, each of these techniques has yielded wide differences in sensitivity and specificity.

The objectives of the present study was to assess the results of abdominal ultrasound-guided transvaginal myometrial CNB as a diagnostic procedure to confirm adenomyosis in uterine-preserving treatment and to report the concordance between transvaginal myometrial CNB and ultrasonographic diagnosis of adenomyosis.

Material and Methods

Study Subjects

The medical records for 1032 consecutive premenopausal women who had undergone transvaginal myometrial CNB and radiofrequency thermal ablation after a preliminary diagnosis of suspected adenomyosis between January 2006 and June 2013 were reviewed. In the present study, we obtained results for patient factors such as Pictorial Blood Loss Assessment Chart (PBAC) scores for measurement of menstrual volume, pain scores on a numeric rating scale of 0 to 10 for assessment of dysmenorrhea, uterine dimensions related to myometrial thickness, and myometrial CNB results, as recorded on patient records. All patients had submitted written informed consent to undergo transvaginal myometrial CNB and radiofrequency thermal ablation before undergoing these interventions. The public institutional review board approved the study, and because it was a retrospective study, it was exempt from requiring patient informed consent.

Operational Definition of Menorrhagia and Dysmenorrhea

Menorrhagia was defined as a PBAC score >100 [24], and dysmenorrhea as a total pain score of >3 points. The total pain score was calculated by summing each mean daily pain score of ≥ 3 of the most recent menstrual cycles minus 3 on the 0 to 10 numeric rating scale [25,26]. When a mean daily pain score was <3 points (mild pain) it was excluded from the calculation. Although the arbitrarily modified pain scoring system used in the present study does not provide an objective standard for pain measurement, it was useful in determining the severity of dysmenorrhea experienced by the patients.

Uterine Morphometry on Ultrasonographic Examination

After determining the PBAC and pain scores, vaginal ultrasonographic studies were performed using 5- to 7.5-MHz transducers, and abdominal ultrasonography was performed using 3- to 5-MHz transducers (Aloka 1700; Aloka Co., Ltd., Tokyo, Japan) and Accuvix XQ (Medison Co., Ltd., Seoul, Korea) ultrasound machines. All ultrasonographic examinations were performed by a single experienced physician (J-h. N) in the outpatient department and in the operating room just before transvaginal myometrial CNB. During ultrasonographic examination, uterine size and borders (including the thicknesses of each anterior and posterior myometrial wall), uterine width, myometrial echotexture, myometrial cyst, endometrial abnormality, and presence of associated abnormalities were assessed. The myometrial thickness of each anterior and posterior uterine wall was measured anteroposteriorly (from the endometrial-myometrial junction to the uterine serosa) at the thickest portion of the myometrium in the sagittal plane. The uterine width was determined by measuring the distance between 2 points that were farthest in the widest portion of the uterus in the transverse plane. In the present study, the normal thickness of each of the anterior and posterior myometrial walls was defined as ≤ 2.0 cm based on a previous study [27]. When a distinct sonographic endometrial lining was lacking owing to severe deep adenomyosis, the endometrial cavity was examined by introducing a curved uterine sound or a No. 1 Hegar dilator under ultrasound guidance. This procedure enabled the endometrial cavity to be easily identified on ultrasonography; thus, the myometrial thickness could be easily measured.

After thorough ultrasonographic examination, a preliminary diagnosis of adenomyosis was made if there was myometrial thickening of >2 cm and concomitantly ≥ 1 of the following ultrasonographic findings: enlarged globular and/or asymmetric uterus, subendometrial hypoechoic myometrial striations, myometrial cyst, heterogeneous myometrium, and shaggy and mottled endometrial stripes [5,8,12].

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