

# The role of endovaginal ultrasound in differentiating endometriomas from other ovarian cysts

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*Summary:* Endometriomas have a prevalence of 24% among all ovarian cysts. Various sonographic features have been proposed to identify endometriomas. Although the visualization of ovarian masses with low-level internal echoes is suggestive for the endometriotic origin of the cyst, no data are yet available on the specificity of endovaginal ultrasonography in differentiating endometriomas from other ovarian masses. To address this issue, the sensitivity, specificity, negative and positive predictive values of endovaginal ultrasonography in comparison with pathology were calculated for each visualized cyst. The study population (n=251) consisted of all premenopausal non pregnant women submitted to laparotomy or laparoscopy between May 1991 and March 1993 at the Department of Obstetrics and Gynecology of the University of Cagliari. Within one week before surgery, all patients underwent endovaginal ultrasonography and 93 ovarian cysts were visualized. After the scan, the physician gave prospective impressions as to the presence of endometriomas using the visualization of round-shaped homogeneous hypoechoic "tissue" of low-level echoes within the ovary as characteristic ultrasonographic finding. Ultrasonographic impression was compared with histopathological diagnosis. Out of 93 adnexal masses detected by ultrasound, 31 were suspected to be endometriomas and the diagnosis was confirmed in 24. The sensitivity and the specificity of endovaginal ultrasonography in differentiating endometriomas from other ovarian cysts were 83% and 89%, respectively. This specificity (89%) is comparable with that obtainable with magnetic resonance imaging (91%).

*Key words:* Endometrioma; Endometriosis; Laparoscopy; Endovaginal Ultrasonography.

## INTRODUCTION

Endometriomas have a prevalence of 24% among all ovarian cysts<sup>(1)</sup>. Since surgery is the treatment of choice for en-

dometriomas<sup>(2)</sup>, the possibility of a differential diagnosis with functional cysts, is crucial.

In a retrospective study, Athey and Diament<sup>(3)</sup> analyzed the value of transabdominal ultrasonography in the detection of endometriomas among adnexal masses. In 1992, Kupfer *et al.*<sup>(4)</sup> described the spectrum of endovaginal sonographic findings of surgically proved endometriomas, but did not analyze the specificity or the efficiency of this technique.

To investigate the value of endovaginal ultrasonography in differentiating endome-

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triomas from other ovarian cysts, the sensitivity, the specificity, the positive and the negative predictive values of endovaginal ultrasonography in comparison with pathology were calculated for each visualized ovarian cyst.

## MATERIALS AND METHODS

The study population (n=251) consisted of all premenopausal non pregnant women submitted to laparoscopy or laparotomy at the Department of Obstetrics and Gynecology of the University of Cagliari between May 1991 and March 1993. The patients underwent surgery for infertility, chronic pelvic pain, uterine fibroids or adnexal masses. Only women with previous bilateral salpingoophorectomy, with previously treated ovarian carcinoma, or with endometrial or cervical carcinoma were excluded from the study. The patients' ages ranged from 17 to 54 yrs.

All patients were submitted to endovaginal ultrasonography, within one week before surgery, with a Toshiba Sonolayer-L SAL 77B real time scanner, using a 5 MHz endovaginal mini-convex probe (Toshiba Corporation, Medical System Division, Tokyo, Japan). A second scan was performed if, during the first, the ovary was not visualized. All scans were performed by the same physician. After the scan, the physician gave prospective impressions as to the presence of endometriomas if a round-shaped homogeneous hypoechoic "tissue" of low-level echoes had been visualized within the ovary.

At surgery, all ovarian masses were enucleated from the ovary or removed with the ovary. All specimens were examined by the same pathologist. To evaluate the role of endovaginal ultrasonography in differentiating endometriomas from other ovarian cysts, the sensitivity, the specificity, the positive and the negative predictive values were calculated for each ovarian cyst visualized during ultrasonographic examinations.

## RESULTS

Out of 93 visualized cysts, 31 endometriomas were suspected by endovaginal ultrasonography and 24 were confirmed by pathology. The ultrasonographic finding of the 7 false positive cases (simple cyst, n=2; hemorrhagic cyst, n=3; dermoid, n=1; ovarian fibroid, n=1) was the sa-

me considered as characteristic for endometriomas.

The 24 endometriomas confirmed by pathology had ultrasonographic mean  $\pm$  SD diameter of  $39 \pm 16$  mm, ranging from 17 mm to 65 mm.

The ultrasonographic diagnosis of non-endometrioma was confirmed by pathology in 57 out of 62 cases (serous cysts, n=16; simple cysts, n=14; mucinous cystoadenomas, n=3; serous cystoadenomas, n=2; corpora lutea, n=12; hemorrhagic cysts, n=5; borderline serous cystoadenoma, n=1; serous cystoadenoma, n=1; teratoma, n=3). The false negative cases were ovarian masses with anechoic content at ultrasound. In one case the mass was suspected of being malignant because of the complex appearance.

Therefore, the specificity of endovaginal ultrasonography in differentiating endometriomas from other ovarian masses was 89% with a sensitivity of 83%, a positive and a negative predictive value of 77% and 92%, respectively.

## DISCUSSION

This is the first prospective study which demonstrates that endovaginal ultrasonography has a specificity of 89% in differentiating endometriomas from other ovarian masses. This specificity is comparable with the 91% specificity previously reported by other authors for the more expensive technique, magnetic resonance imaging (MRI) (<sup>5</sup>). Therefore, the use of MRI is not justified in differentiating benign ovarian masses, when endovaginal ultrasonography can be performed.

The false positive cases described in the present study underline that a ultrasonographic misdiagnosis of endometrioma is possible either when the ovarian mass is very small or the content of the mass is not clear fluid, as in dermoid or hemorrhagic cysts.

In conclusion, the present study suggests that endovaginal ultrasonography should always be performed before surgery for adnexal masses, because of the high specificity in differentiating endometriomas from other cysts.

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