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Original Research

Accuracy of transvaginal ultrasound, saline infusion sonohysterography, and office hysteroscopy in the diagnosis of endometrial polyps

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Summary

Background: Endometrial polyps (EPs) derive from overgrowths of stromal or endometrial glands supported by a fibrovascular core. Currently, there is no clear recommendation on the first-line tool to be employed between sonohysterography (SIS) and office hysteroscopy (ISC) in the evaluation of patients with the suspect of EPs. *Materials and Methods:* The authors performed a retrospective study on consecutive patients referred at their Unit with a suspicion of EP at transvaginal sonography (TVS). A total number of 1,243 patients were subject to TVS and ISC, while 128 ones were subject to TVS, SIS, and ISC. Primary outcome was the evaluation of the diagnostic performance of SIS and ISC in the detection of EPs. *Results:* ISC allowed the identification of EPs in all the cases (n=128/128 patients), with a sensitivity of 100% and specificity of 98%. For SIS, the sensitivity was 97% (n=124/128 patients) and specificity was 90%. *Conclusions:* ISC showed better diagnostic accuracy in comparison to SIS. Due to high diagnostic accuracy and the possibility to "see and treat" EPs in a single step, ISC should be considered as the gold standard approach in women with a suspect of EPs.

Key words: Endometrial polyps; Saline sonohysterography; Fibrovascular core.

Introduction

Endometrial polyps (EPs) derive from a focal or multifocal overgrowth of stromal and endometrial glands supported by a fibrovascular core [1]. They can be single or multiple and can vary from a few millimeters to some centimeters, typically developing in the upper-third of the uterine cavity or in the fundal region [2, 3].

Macroscopically, EPs have a reddish-yellow color with a translucent appearance and may exhibit localized necrotic and/or hemorrhagic areas [1, 3]. They are classified according to their histological composition in adenomatous EPs (i.e. with greater glandular component) and fibrous EPs (i.e. with a major fibrous component) [4]. Histologically, EPs differ from placental and fibrinotic polyps, which consist of placental residues or amniocorial membranes, and generally occur during the puerperal age [5].

The overall prevalence of EPs in the female population is 8% [1, 2], but in peri-menopausal women (from 40 to 50 years of age) they are considerably more common (up to 25%) [6]. Clinically, EPs are associated with abnormal uterine bleeding (AUB) but can also be non-symptomatic. When they manifest with AUB, the bleeding symptom can be accompanied by pelvic pain caused by uterine contractions, especially when the EP is large [2, 4].

The visual diagnosis of EPs can be obtained with transvaginal ultrasonography (TVS), saline sonohysterography (SIS) or hysteroscopy (ISC) [3, 7, 8], while the definitive diagnosis is based on histological examination.

TVS is used as an initial investigation due to easy access and low costs, but it is impossible to differentiate intrauterine pathology with high precision. SIS is more invasive than TVS, as it includes the instillation of a saline solution in the uterine cavity through a transcervical catether [9, 10]. The resultant distension of the uterine cavity allows the visualization of the inner surface of both sides of the endometrium and a more reliable evaluation of uterine contour, adhesions, and focal pathologies in comparison to TVS [11].

ISC is more invasive than SIS and may require analgesia [12]. Nevertheless, it allows a direct visualization of endometrial surface, namely enabling a simple recognition of endouterine lesions. Furthermore, ISC permits a "see and treat approach", where both diagnosis and treatment of endouterine pathology can be accomplished in a single step [13].

Currently, there is no recommendation on the first-line tool to be employed between SIS and ISC in the evaluation of patients with the suspect of EPs. Thus, the primary aim of the present study was to compare the diagnostic accuracy of SIS and ISC in a cohort of women in whom EPs

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Table 1. — *General features of the study population.*

Age (years)	45.8 ± 7.2
BMI (kg/m^2)	23.9 ± 4.1
Parity	1.8 ± 0.5
Polyp size (mm)	8.9 ± 4.1

were suspected at TVS. The secondary aim was to compare the diagnostic accuracy of TVS and ISC in a larger sample of patients.

Materials and Methods

The authors performed a retrospective study on a cohort of consecutive patients referred at to the Unit (Gynecology and Obstetrics Clinic, University of Sassari, Italy) From January 2013 to December 2015 due to a suspicion of EP at TVS. A total number of 1,243 patients were subject to TVS and ISC, while 128 were subject to TVS, SIS, and ISC.

The study group included both pre-menopausal and post-menopausal women. Exclusion criteria were history of pelvic infections, gynecological malignancy, and tamoxifen therapy. In all patients, ISC was offered after the completion of SIS. All procedures were performed during the follicular phase of the menstrual cycle (from days 5 to 10) in pre-menopausal women, while no time restriction was applied for post-menopausal women. In all cases, a definitive histological diagnosis of the EPs was obtained. All the procedures were performed by skilled operators. For TVS and SIS, ultrasound systems were used.

SIS was performed as follows: the first operative step was vaginal disinfection with 5% iodopovidone. After the speculum was placed, a catheter was inserted through the cervix. Transvaginal probe was placed in the vagina. Between 5 and 10 cc of sterile physiological solution with 20 ml syringe under ultrasound guidance were introduced. The contrast progressively distended into the walls of the uterine cavity allowing the study of endometrial surface. Thence, the spatial location of any lesion rising from the endometrial surface was detected, as well as the type and size of the location. In doubtful cases, the use of color Doppler allowed for the evaluation of the vascularization of the lesion. The organ was studied through transversal and sagittal sections [4].

ISC was performed in an outpatient regimen by a single surgeon. Procedures were performed with specific equipment, a continuous-flow office hysteroscope with a double jacket and an operating channel, and a 2.9-mm 30° hole-oblique lens. At the end of the procedure, in each patient, complete removal of the polyp was performed immediately or in a second step. All EPs were confirmed at histopathology.

Primary outcome was the evaluation of the diagnostic performance of SIS and ISC in the detection of EPs. Secondary outcome was the comparison of the diagnostic accuracy of ISC and TVS in detecting EPs. Outcomes measures were sensitivity and specificity of the index tests, compared with the reference standard (histopathological examination).

Results

The general characteristics of the population examined are displayed in Table 1. ISC allowed the identification of EPs in all the cases (n=128/128 patients), with a sensitivity of 100% and a specificity of 98%. For SIS, the sensitivity was 97% (n=124/128 patients) and specificity was 90%.

Table 2. — *Sensitivity and specificity of transvaginal sonography (TVS), sonohysterography (SIS), and hysteroscopy (ISC) in the detection of endometrial polyps.*

	TVS	SIS	ISC
Sensitivity	80,98%	97%	100%
Specificity	70%	90%	98%

Finally, TVS showed, respectively, a sensitivity of 80.98% (n=104/128) and a specificity of 70% (Table 2).

Discussion

EPs are the most common benign, endouterine pathology and often represent accidental findings at TVS. Nevertheless, there is currently a lack of clear recommendations which diagnostic test should be employed as a first-line gold standard in the diagnosis of EPs. Thus, the choice of the best method is yet at the discretion of the clinician.

The present retrospective study aimed to identify the accuracy of TVS, ISC, and SIS in a large sample of patients (n=1243). Interestingly, a considerably lower sensitivity and specificity was found for TVS in comparison to SIS and ISC. Namely, it suggests that TVS alone could be insufficient in diagnosing and excluding the presence of endo-uterine lesions. With regards to this, the concept must be stressed that the early identification of polypoid endometrial lesions (followed by a prompt removal) is of critical importance because cancer can be hidden under or nearby in about 1% of cases [14].

Differently from TVS, SIS was associated with a good diagnostic accuracy in the identification of EPs (97% sensitivity and 90% specificity). This procedure is generally well-tolerated by patients [5], and does not require neither intestinal preparation nor antibiotic prophylaxis. The discomfort associated with SIS mainly depends on difficulties in the introduction of the catheter into the cervix and on uterine contractions during the instillation of the contrast medium [15]. With regards to this, catheters of reduced diameter and the introduction of a minimal volume of physiological solution may guarantee a quick and well-tolerated procedure in terms of patient compliance [16]. The limits that the operator may encounter during the examination are represented by the difficulty of introducing the catheter into nulliparous patients or with a stenotic cervix, an inadequate distension of the uterine cavity, and the impossibility to perform a targeted biopsy [17, 18]. The main risk of SIS is associated with the possible propulsion of cancerous cells from the fallopian tubes in the abdominal cavity, when an occult endometrial cancer is encountered [19].

ISC appeared to be the most accurate diagnostic tool, with a sensitivity of 100% and a specificity of 98%. The main advantages of this diagnostic tool are the direct visualization of endouterine lesions and the possibility of diagnosing and treating each lesion in a single procedure (i.e. “see and treat”)

[20, 21]. Due to all the aforementioned, ISC is currently recommended in the management of women suffering from recurrent miscarriage and/or with repeated failures with IVF, regardless of the results of TVS [22, 23]. Otherwise, the main problems of ISC are the potential severe or intolerable pain (which may occur in up to 20% of patients) and the risk of uterine perforation (which may occur in 0.12–3% of the procedures). Nulliparity, presence of cervical pathology, and duration of the procedure are the main predictors for pain during ISC, while the lack of experience of the surgeon is the major risk factor for uterine perforation [24, 25]. Thus, a proper choice of candidates for outpatient ISC, as well as a skilled surgeon are critical in maximizing the success rates of the procedure and minimizing the risk of surgical complications.

Conclusion

ISC was associated with higher diagnostic accuracy in comparison to TVS and SIS. Given the chance of accomplishing diagnosis and treatment in a single step, office SIS in experienced hands should be considered as the gold standard approach in women with a suspect of EPs.

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