The bright edge of the endometrial polyp

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ABSTRACT

Objective To evaluate the accuracy of sonographic detection of endometrial polyps using a new ultrasound marker denoted ‘the bright edge of the polyp’.

Methods The ultrasound scans of the uterus were examined for the presence of the bright edge in two groups of women. The first, a retrospective group, included 40 women in whom both a histological diagnosis of endometrial polyps and sonographic scans were available for evaluation. The second, a prospective group, included 80 women scheduled for operative hysteroscopy because of endometrial irregularities detected by sonography. In this group the hysteroscopic and histological results of the removed endometrial tissue were correlated with the sonographic diagnosis.

Results In the retrospective group, the bright edge marker, indicative of the presence of a polyp, was detected in 30 out of 40 scans available for evaluation. In the prospective group this marker was detected in 60 women out of 80. Endometrial polyps were confirmed in 56 of these 60 women. In three cases a submucosal myoma was found and in one case the histology showed simple cystic hyperplasia. Two polyps were found in 20 cases where the bright edge had not been detected. This marker has a sensitivity of 96%, specificity of 82%, positive predictive value of 93%, and negative predictive value of 90% in this group at high risk for endometrial abnormalities.

Conclusion The bright edge of the polyp is an accurate sonographic marker for the detection of endometrial polyps in women with endometrial irregularities demonstrated on ultrasound.

INTRODUCTION

Uterine polyps are pedunculated or sessile excrescences of endometrial tissue. Ultrasound findings may include nonspecific thickened endometrium, a focal echogenic area within the endometrium or, occasionally, an endocavitary mass surrounded by fluid. The sonographic diagnosis of a polyp is facilitated in the presence of surrounding endometrium or fluid, which act as a contrast medium and enable the polyp to be accurately delineated. In most cases the sonographic diagnosis of a polyp cannot be established accurately and in such cases sono-hysteroscopy is recommended. We propose a new sonographic marker called ‘the bright edges of the polyp’, which appears pathognomonic for the diagnosis of a polyp in the endometrial cavity. We further assess the suitability of this marker as a predictor for the diagnosis of endometrial polyps.

METHODS

A total of 120 women were recruited into the study, 40 into the retrospective arm and 80 into the prospective arm of the study. In the retrospective group both the histological diagnosis of endometrial polyps and the results of ultrasound scans were obtained from the medical records of 40 women available in 1997.

In the prospective group 80 women were recruited (between January and June 1998). They were referred from peripheral clinics because of endometrial irregularities detected by ultrasonography, and were scheduled for hysteroscopy and diagnostic curetage. These women underwent transvaginal sonography prior to their operative procedure. This group was further divided into two subgroups: (1) women in whom sonography detected the bright edge marker as described below (endometrial polyp group); and (2) women in whom this marker could not be detected, were assigned (no endometrial polyp group). The final results from the hysteroscopy and histology in the entire prospective group were correlated with the sonographic diagnosis.

Abnormal uterine bleeding was the indication for ultrasound referral in 52% of cases (21/40) in the retrospective group, and 43% (24/56) of women in the prospective group 1 (endometrial polyp group). In the remaining cases of women who did not suffer from abnormal bleeding ultrasound was performed because of other

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unrelated indications. Fifty-one women (53%) out of 96 with a proven polyp (both study groups) were asymptomatic, i.e. with no abnormal uterine bleeding.

Transvaginal sonography was performed in all cases and the presence or absence of bright edges surrounding the identified uterine mass was recorded. The bright edges were defined as sharp and smooth echogenic lines positioned at the transitional zone between the myometrium and centrally undefined endometrial echoes (Figure 1). The endometrial width was measured using electronic calipers positioned across the region of maximum thickness as visualized on the sagittal section of the uterus. Both anterior and posterior walls of the endometrium were included in the measurement. Other sonographic markers indicative for the diagnosis of an endometrial polyp such as hyperechogenicity and the presence of small cystic structures and the indications for the ultrasound examination were also recorded.

RESULTS

The mean age of the patients (± SD) was 52 ± 11.7 years (range, 22–76) in the retrospective group (n = 40) and 55 ± 11.6 years (range, 31–79) in the prospective group.

In the 40 scans evaluated in the retrospective group the bright edge marker was detected in 30 cases (75%). In the 80 scans evaluated in the prospective group the bright edge marker was detected in 60 cases (75%). The diagnosis of endometrial polyp was verified hysteroscopically and histologically in 56 cases. In the four cases with a false positive diagnosis of a polyp, three women had a submucosal myoma and in one case histology showed simple hyperplasia. In two out of 20 patients the bright edge was not detected and small polyps (3 mm and 8 mm) were found. These data give a sensitivity of 96%, specificity of 82%, positive predictive value of 93% and negative predictive value of 90% for the bright edge marker in the diagnosis of endometrial polyp. It is noteworthy that 56 out of 58 (96.5%) actual polyps could be detected based on the bright edge marker.

Two out of the 56 women with a confirmed polyp also had an endometrial carcinoma. The indication for performing the ultrasound was postmenopausal bleeding in one case and routine examination before starting hormone replacement therapy in the second case.

The mean measured endometrial width was 14.2 ± 5.5 mm (range, 6–31) in the retrospective group and 13.5 ± 7 mm (range, 4–32) in the prospective group.

Other markers for endometrial polyp were identified in 79 cases. Echogenicity was detected in 14 (35%) and cystic structures in 11 cases (27%) of the retrospective group. In the prospective group, in 56 cases with the true prospective positive diagnosis of a polyp, echogenicity was found in 42 (75%) cases and cystic structures in 12 (21%).

DISCUSSION

The finding of nonspecific thickened endometrium on ultrasound examination of the uterine cavity initiates major concern. Such an appearance may represent endometrial irregularities suggestive of endometrial hyperplasia, changes in the inner myometrium due to treatment by tamoxifen, carcinoma or an endometrial polyp.

Hulka et al. in a retrospective study of postmenopausal
women, attempted to characterize endometrial polyps, hyperplasia, and carcinoma using transvaginal ultrasound. The endometrial appearance was categorized into one of three groups: hyperechoic, containing cystic spaces or heterogeneous. The pathological and sonographic findings were correlated following operative procedures. Some pathological diagnoses were common to all three categories of appearances thus rendering transvaginal sonography inaccurate in the differential diagnosis of these three conditions.

The bright edge appearance proposed in this paper as a pathognomonic marker in the diagnosis of endometrial polyps enables the accurate ultrasound diagnosis of an endometrial polyp to replace the previously rather intuitive method of detection. In our experience, this marker can be frequently observed and thus facilitates diagnosis of endometrial polyps. Conversely relying on other less specific signs, such as differential echogenicity and the presence of cysts, decreases the reliability of the technique. It is noteworthy that the bright-edge marker is clearly shown in the ultrasound images presented by Hulka et al. (Figure 3: sonogram of endometrial polyp) but was overlooked by the authors.

The occurrence of this specific marker stems from the basic principles of echo formation and registration utilized in ultrasound imaging. A large difference in the acoustic properties of the endometrium and the polyp will result in the ultrasound appearance of a smooth and sharp interface between the two tissues. Interfaces that are perpendicular to the sound beam will produce fewer defined echoes than those presenting a smaller angle of incidence (see Figure 1). Owing to its circular shape only small portions of a polyp’s boundaries, which are perpendicular to the sound beam, will be well imaged. These boundaries are represented by the one or two short, well defined, hyperechogenic linear echoes (Figure 1b,c). This feature is characteristic of the polyp’s borders and distinguishes the polyp from all other pathogenic irregularities.

The opposing layers of endometrium surrounding the endometrial cavity are similarly represented by a well defined, hyper-echogenic linear echo complex (Figure 2a). The echogenicity and the sharpness of this echo complex are the result of the specular reflection produced by the smooth surfaces of the two endometrial layers. On the other hand the interface at the transition zone between the myometrium and the basal endometrium is non-specular and thus produces a poorly defined boundary between the two tissue types (Figure 2). Thus, when a hyper-echogenic linear echo or bright marker is found at the boundary between the myometrium and what seems to be a thick or irregular endometrium, the presence of a polyp should be suspected.

Our data suggest a close inspection for the bright marker should be carried out whenever irregularities are observed in the transitional zone between the myometrium and the endometrium. The sonographer must be aware of the importance of manipulating the transducer to ensure that the interfaces of interest are perpendicular to the sound beam in order to identify, or exclude, the bright marker.

Figure 2 (a) Sagittal transvaginal ultrasound image of a uterus in the ovulatory period of the menstrual cycle. A three-layered endometrium is noted: the endometrial lumen is demonstrated by the central echogenic line (black arrow), an hypoechogenic layer representing the edematous endometrium functionalis and an outer echogenic layer representing the endometrium basalis (arrowheads). The central line is sharper and better defined than the outer lines. (b) A full thickness histological picture of the endometrium (E) and adjacent myometrium (M). The arrowheads point to the smooth surface endometrium and the arrow to the blurred transitional zone between the myometrium and the endometrium.

Failure to appreciate this fact may explain why the bright-edge marker could only be detected in 75% of the cases in the retrospective group. Sonographers unaware of its importance probably failed to identify it during the ultrasound examination and thus it was not recorded in the pictures taken for the medical file.

It should be emphasized that our prospective study group of women with endometrial sonographic findings included both symptomatic and asymptomatic women. Using our new marker, we correctly diagnosed 56 out of 58 cases with endometrial polyps among a group of 80 women with endometrial irregularities. In all cases, the sonographic diagnosis was hysteroscopically and histologically confirmed. These results indicate that the bright edge can be a reliable sonographic marker of endometrial polyps. It is noteworthy that three of the 56 suspected polyps were diagnosed as a myoma. The ultrasound appearance of a submucosal myoma may mimic the bright
marker of a polyp (Figure 3). However in most cases the myoma can be differentiated from a polyp because of the additional and characteristic sonographic features of spherical shape, frequent hypo-echogenic centre and, in some cases, attenuation of the ultrasound beam. The significance of the accuracy of our results is limited to women with prior sonographic findings within the endometrial cavity.

The occurrence of carcinoma in benign polyps has been reported to be no more than 0.5% although polyps have been found in 12–34% of uteri with endometrial carcinoma. These data are derived from two studies published in 1956 and 1972, respectively, prior to the ultrasound era. At that time, most endometrial polyps were diagnosed due to their typical symptoms of irregular bleeding. Clearly, these data, derived from symptomatic women, is of questionable relevance for asymptomatic patients with an endometrial polyp.

A further issue is whether asymptomatic endometrial polyps should be removed as, in our study, polyps were an incidental sonographic finding in 53% of women. In our prospective study group, we found endometrial carcinoma in association with a polyp in two women, one of whom was symptomatic and one asymptomatic. The asymptomatic woman was postmenopausal and, prior to starting hormone replacement therapy, underwent a routine pelvic ultrasound examination which revealed thickened, 8 mm, endometrium. This finding suggests that, without additional differentiating data, the current policy of strict removal of all diagnosed polyps should remain.

Another aspect of the prompt and accurate diagnosis of a polyp during the ultrasound examination relates to patient counseling and the planning of further diagnostic tests. Polyps, which are usually benign, are most commonly found in women between 40 and 50 years of age and occur relatively frequently after the menopause. In this group of women an abnormal endometrial width may be caused by the presence of a polyp. Indeed in our study group the average endometrial width was 13 mm, a value that mandates further investigation in order to exclude malignancy. The presence of the bright edge pathognomonic marker enables an accurate diagnosis of endometrial polyp to be made, thus eliminating the need for sonohysterography in these women. With the presumptive diagnosis of endometrial polyp the patient can be counselled appropriately, reducing her anxiety until a final histological diagnosis is made.

We conclude that the presence of the bright edge marker at the transitional zone between the myometrium and central endometrial irregularities, is highly indicative of an endometrial polyp.

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