ORIGINAL

# Type I and Type II Endometrial Adenocarcinomas: Comparative Study of Ultrasonographic Parameters

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## Abstract

**Objectives:** The aim of this study was to compare ultrasonographic aspects of type I and II endometrial adenocarcinomas, seeking to identify differences that could predict the likely histological pattern before curettage. **Materials and Methods:** This was a retrospective study with 117 women with type I endometrial adenocarcinomas and 17 women with type II, admitted to the Barretos Cancer Hospital, Barretos, Brazil between February 2007 and December 2009. Patient medical records were reviewed according to standardized form, collecting clinical and histopathologic information in addition to information related to ultrasonographic aspects. **Results:** The most commonly described ultrasonographic aspect was homogenous myometrium (65.8%), heterogeneous endometrial aspect (66.6%), regular endometrial basal layer (66.6%) and the endometrial cavity not filled by material (51.1%).Myometrial echogenicity proved the only variable in that there was no statistically significant difference, with heterogeneous aspect more frequently found in type II carcinoma (80.0% vs. 27.8%; $p = 0.039$). **Conclusions:** This study noted few differences between the two groups in reference to ultrasonographic aspects. The only variable that demonstrated statistical significance was myometrial echogenicity. Other studies are necessary for the validation of results presented here.

**Keywords:** carcinoma, endometrial neoplasms, endometrioid, histology, ultrasonography.

## INTRODUCTION

Endometrial carcinoma is the most common gynecological cancer in the United States, accounting for about 8,000 deaths per year. It has a high incidence regardless of race and country of origin. However, black women have twice the risk of dying from the disease due to a more aggressive histological subtype and less access to health services. In most cases the diagnosis is done early, which provides improved survival for these women. Studies have shown 5-year disease-free survival rates of 96%, 66% and 24% for local, regional and metastatic disease, respectively[1-4].

Epidemiology and different prognosis describe the two forms of endometrial cancer. Type I endometrial carcinoma (endometrioid) represents 80% of cases. It is considered an estrogen-dependent tumor, usually described as low histological grade and associated with atypical endometrial hyperplasia. The tumor has as risk factors, obesity, nulliparity, early menarche, late menopause, diabetes mellitus and hypertension. Type II endometrial carcinoma, papillary serous (UPSC) and clear cell type, represents 20% of cases and is not related to estrogen or endometrial hyperplasia and presents with a more aggressive histological subtype and worse prognosis. These patients are generally multiparous and do not present an increased incidence of obesity, hypertension and diabetes. They are older women when compared with those affected by type I[5].

Ultrasound is the examination of election to determine which women with vaginal bleeding should be submitted to endometrial biopsy[6]. Ultrasound presents sensitivity of 95.6 to 100%, specificity of 61 to 74%, positive predictive value of 53.3% and negative predictive value of 60% for cancer diagnosis[7-10]. Some authors believe that ultrasound can reduce the use of invasive therapies up to 40%, aiding in the diagnosis of endometrial cancer[11].

Few studies in the literature compare the ultrasonographic aspects of type I and II endometrioid carcinomas. Thus, the objective of this study was to compare the ultrasonographic aspects of type I and II endometrial tumors.

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## METHODS

This was a single institution-based retrospective study including patients diagnosed with endometrial cancer and treated at Barretos Cancer Hospital, Barretos, Brazil between February 2007 and December 2009.

The patients were identified from the cross-reference of database information of the Department of Pathology and the hospital registry data of the institution.

A standardized form was used for the data collection from patient medical records. This form collected clinical information, anatomopathologic information of curettage and previous surgeries, in addition to ultrasonographic data.

Seven ultrasonographic parameters were compared among patients with type I and II endometrial cancer: endometrial echogenicity, myometrial echogenicity, regularity of the endometrial basal layer, endometrial cavity filled with any material, presence of endometrial polyp, uterine size and thickness of the endometrium.

Statistical analyses were conducted through the program SPSS version 15.0. The comparison of numerical variables was through the Mann-Whitney U test. The association between histological type and other qualitative variables was determined by Fisher´s exact test.

## RESULTS

Data were evaluated from 134 patients, of which 117 were with type I carcinoma (87.3%) and the others type II. The study population was formed mostly by nonwhite women (104 cases, 77.6%), with age ranging from 43 to 90 years (median, 62 years). More than half of the patients had local disease: stage I (64 patients, 47.8%) and stage II (27 patients, 20.1%).

In relation to ultrasonographic findings, the majority of cases showed homogenous myometrium (65.8%), heterogeneous endometrial aspect (66.6%), regular endometrial basal layer (66.6%) and the endometrial cavity not filled by material (51.1%) (Table 1).

When comparing the two groups, no statistically significant difference was noted concerning age, ethnic group, age at menarche, age at menopause, number of prior gestations, body mass index and stage of disease. In reference to ultrasonographic information, only the myometrial aspect showed difference between the groups, with heterogeneous aspect more frequently found in type II carcinoma (80.0% vs. 27.8%; $p = 0.039$). Tables 1 and 2 show comparisons of ultrasonographic findings according to histological type.

## DISCUSSION

It was observed in this study that most cancers of the endometrium belonged to the histological type endometrioid adenocarcinoma and the average age of disease onset varies from 50 to 60 years, these facts supported by the literature[12].

Several authors have demonstrated that ultrasound is an effective detection method, with rates of sensitivity ranging from 95% to 100% and specificity of 61% to 74% for endometrial cancer detection. This tool has been employed in the diagnosis of different gynecological disorders. Several studies have established a correlation between endometrial thickness and the presence of intracavitary diseases on material obtained for curettage. However, ultrasound does not allow precise diagnosis, being only a screening method to indicate an abnormality in the uterine cavity or the endometrium[13-16].

There is no relationship described in the literature between various ultrasonographic aspects and the histological type of endometrial cancer. This study observed higher prevalence of heterogeneous myometrium among women with type II adenocarcinoma. This fact should be considered with caution since there were few cases of type II endometrial cancer included in this study. Of these, the information surrounding the myometrium and endometrium was registered in the ultrasonographic records less

**Table 1.** Number and percentage of cases in accord with ultrasonographic aspects and histologic pattern of endometrial cancer (Hospital de Câncer de Barretos, 2007 – 2009).

| Variables | Category | Endometrioid | Clear cells / Serous papillary | Value of *p* (*) |
|---|---|---|---|---|
| Myometrial echogenicity | Homogeneous | 26 (72.2) | 1 (20.0) | 0.039 |
| | Heterogeneous | 10 (27.8) | 4 (80.0) | |
| Endometrial echogenicity | Homogeneous | 14 (35.0) | 1 (20.0) | 0.651 |
| | Heterogeneous | 26 (65.0) | 4 (80.0) | |
| Endometrial polyp | Yes | 2 (4.5) | 0 (0.0) | 1.000 |
| | No | 42 (95.5) | 7 (100.0) | |
| Basal layer endometrium | Regular | 15 (68.2) | 1 (50.0) | 1.000 |
| | Irregular | 7 (31.8) | 1 (50.0) | |
| Endometrial cavity filled | Yes | 19 (47.5) | 4 (57.1) | 0.701 |
| | No | 21 (52.5) | 3 (42.9) | |

(*) Fisher´s exact test.

**Table 2.** Mean values of uterine size and endometrial thickness observed during ultrasonography, and the correlation to the histologic pattern of endometrial cancer (Hospital de Câncer de Barretos, 2007 – 2009).

| Variables | Statistics | Endometrioid | Clear cells / Serous papillary | Value of *p* (*) |
|---|---|---|---|---|
| Uterine size to ultrasound ($cm^3$) | Mean value | 120.8 | 177.7 | 0.510 |
| | n | 42 | 7 | |
| Endometrial thickness to ultrasound (mm) | Mean value | 16,3 | 19.7 | 0.356 |
| | n | 32 | 6 | |

(*) Mann-Whitney U test.

than one-third of the time. Many of the ultrasonographic records originated from other services and lacked quality of information. Therefore, it is necessary to consider the possibility that the result found to be spurious and consequent to an alpha (type I) error. Other studies, preferably with prospective collection, should be performed to verify the association between the alteration of myometrial echogenicity and histological type of endometrial cancer.

The hypothesis could be suggested that the alteration found in myometrial echogenicity would be consequent to varying degrees of tumor infiltration in the myometrium by histological type. Notwithstanding, the analysis by stage showed no difference between the groups. It is possible to imagine, however, that type II endometrial cancer can determine a different pattern of inflammatory reaction in the myometrium in relation to type I, which would justify the results found here. Only histopathological studies that assess the standard inflammatory response at endometrial and myometrial stroma could confirm this hypothesis.

There is an ongoing debate of the variable of endometrial thickness to ultrasound in studies. Fong et al.[17], in a prospective study in which 138 women were included, compared transvaginal ultrasound findings with hysteroscopy and histopathology.In this study based on a ROC curve analysis the value of 6 mm was demonstrated to be the ideal cutoff point for endometrial alteration. Several authors have pointed out that the increase of endometrial thickness to transvaginal ultrasound does not necessarily correspond to lesions of the uterine mucosa, the same associated with numerous cases of false-positives[17-18]. This study did not observe significant difference in relation to endometrial thickness according to histological type.

In summary, this study noted few differences between the two groups with regard to ultrasonographic aspects. The only variable that demonstrated statistical significance was the aspect of myometrium, but with a limited number of cases in the group of patients with type II endometrial cancer. Other studies are necessary for the validation of the results presented here, preferably with prospective data collection.

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