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Uterine tumor resembling sex cord stromal tumor - a case report with operative, immunohistochemical and imaging correlation

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Summary

Uterine tumor resembling sex cord stromal tumor (UTROSCT) is an unusual and very rare group of tumors, with approximately 70 cases reported to date. The tumor was first described in 1976, and has since been characterized using immunochemistry and cytogenetics. A pathologic diagnosis of UTROSCT is made when the tumor shows characteristic histological features and, in addition, positive immunohistochemical staining of markers of sex cord differentiation (calretinin, melan-A, CD56, CD99 or inhibin). Imaging features, however, are non-specific and cannot be used to reliably differentiate this tumor from other uterine masses, such as leiomyomas. UTROSCT appears heterogeneous on ultrasound, and demonstrates hyperenhancement on earlier arterial phase on computed tomography. These tumors appear T1 hypointense or intermediate and T2 intermediate, but more often T2 hyperintense relative to myometrium; it may have slightly more restricted diffusion as a possible differentiating imaging feature. Due to the rare possibility for metastasis, the present authors believe surgical excision is a reasonable course of management.

Key words: Uterine tumor resembling sex cord stromal tumors (UTROSCT); Imaging; SIS; Hysteroscopy; CT; Immunohistochemical stain.

Introduction

Uterine tumor resembling sex cord stromal tumor (UTROSCT) is an unusual and rare tumor, currently classified as a miscellaneous category by the most recent World Health Organization classification of the tumors of the uterine corpus [1]. They are stromal neoplasms with sex cord-like differentiation. This group of tumors was first categorized as UTROSCT by Clement in 1976, though it has been reported prior to 1976 [2]. The current focus on this subtype of uterine tumor has been on their immunohistochemistry and cytogenetic properties, with a paucity of imaging findings on CT. The authors present a case of UTROSCT with immunohistochemical and imaging findings on multiple modalities, including contrast enhanced CT.

Case Report

A 43-year-old Caucasian woman presented to her gynecologist for an annual exam. During the exam she was found to have an enlarged eight-week size uterus on bimanual exam and a clinical history of irregular vaginal bleeding for approximately one year. Pelvic ultrasound demonstrated a thickened endometrium with an inhomogeneous echotexture and suspicion for possible polyp. She then underwent saline sonohysterogram that confirmed an intracavitary lesion measuring 15×10×14 mm (Figure 1). She subsequently had a hysteroscopy with dilation and curettage in order to visualize and remove the polyp (Figure 2). Hysteroscopic evaluation of the cavity revealed a sessile lesion arising from the right fundus of the uterus that was removed and sent to pathology. The cavity otherwise appeared anatomically normal.

Pathologic examination of the obtained biopsy specimen revealed a proliferation of monotonous epithelioid cells with uni-

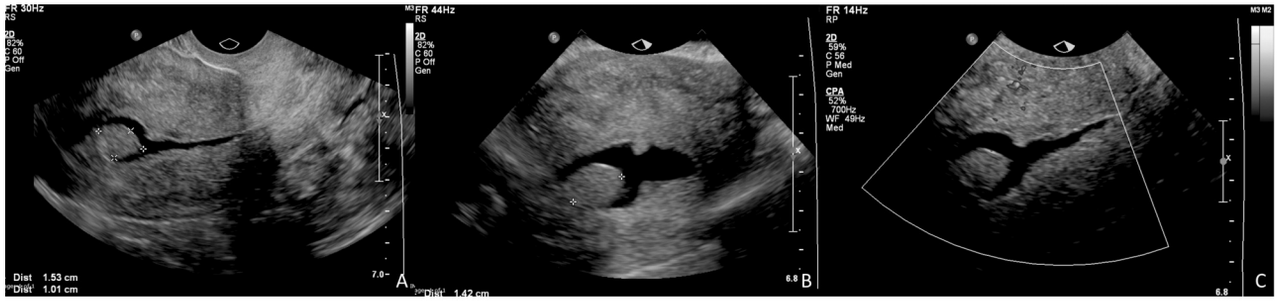

Figure 1. — Saline sonohysterogram of a 43-year-old female with an enlarged uterus. On the grayscale post saline images, a polypoid lesion with a similar echotexture compared to the uterine parenchyma. On the power Doppler image (1C), no vascular stalk is identified.

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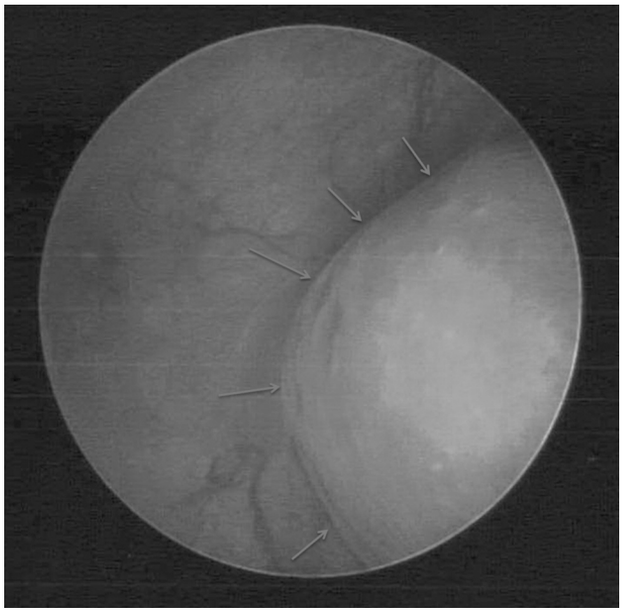

Figure 2. — Photograph taken during the hysteroscopy. The uterine polypoid mass seen on the saline sonohysterogram is partially visualized (outlined by the blue arrows).

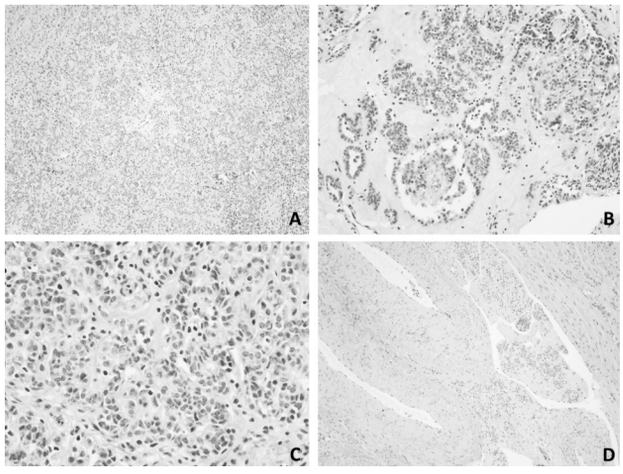

Figure 3. — Histopathology photomicrograph of the tumor. The tumor consists of monotonous epithelioid cells growing in nest, cords or focally diffuse patterns, separated by moderate amount of stroma (3A: H&E, ×4, curettage specimen). Characteristic glomeruloid structures are present (3B: H&E, ×10). Cytologically, the tumor cells have clear to granular cytoplasm and only rare mitotic figures are seen (3C: H&E, ×20). Intralymphovascular growth is present in the hysterectomy specimen (3D: H&E, ×4).

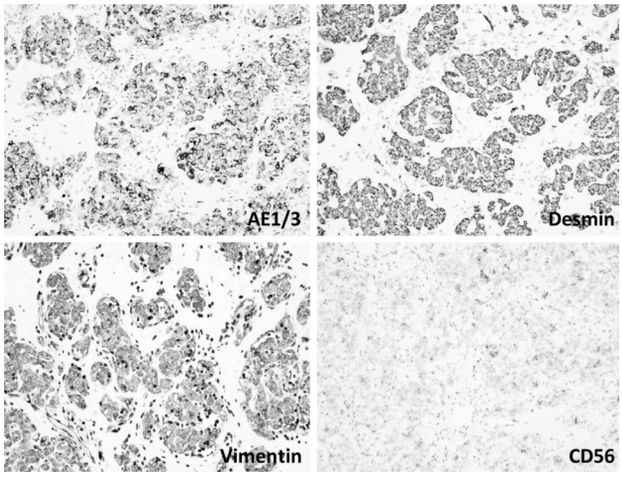

Figure 4. — Characteristic immunohistochemistry photomicrograph of the tumor. The tumor cells are positive for AE1/AE3, desmin, vimentin, and CD56 immunostains.

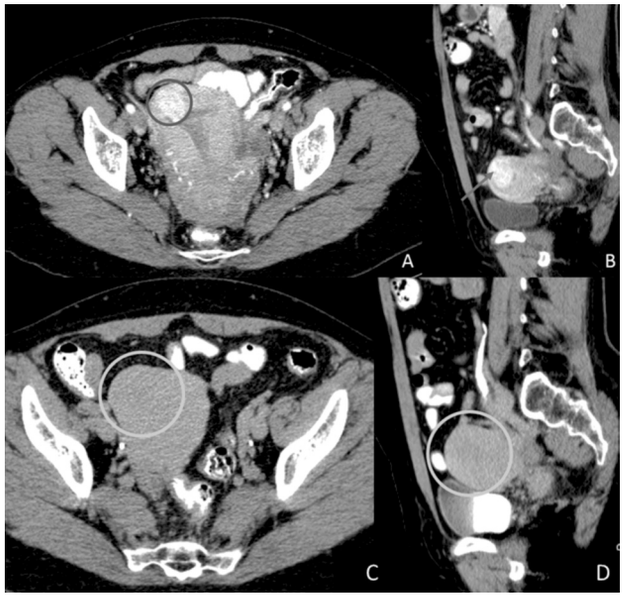

Figure 5. — Contrast enhanced CT in the same patient performed to further evaluate and localize the mass noted on the saline sonohysterogram and hysteroscopy. On the axial CT image (5A), an enhancing mass in the right uterine fundus is seen (blue circle) measuring 169 HU (compared to the normal myometrium measured 107 HU). This mass can also be well visualized on the sagittal reformatted image (5B, blue arrow), spanning the entire thickness of the myometrium. The delayed images from the same CT scan performed 120 seconds after the initial CT scan are demonstrated in 5C and 5D. The mass is now indistinguishable from the background normal parenchyma (orange circles) on the axial and sagittal reformatted images (5A and 5B).

form nuclei and clear to granular cytoplasm growing in nests and cords. These formed occasional glomeruloid structures along with foci of diffuse growth pattern, which were separated by a moderate amount of intervening stroma, primarily involving the endometrium. No significant cytological atypia or mitotic activity were appreciated; lymphovascular invasion was not seen in this specimen. The tumor cells were positive for calretinin, AE1/AE3, desmin, SMA, vimentin, CD10, CD56, and WT1 immunohistochemical markers, while negative for SF1, Melan-A, EMA and inhibin (Figures 3 and 4). Overall, these histologic and immunohistochemical findings were consistent with a UTROSCT.

She subsequently underwent CT of the abdomen and pelvis to characterize the location of the tumor. CT confirmed that the

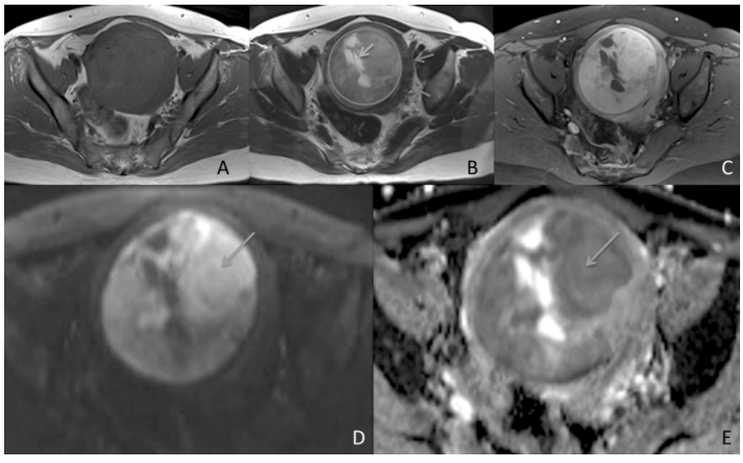

Figure 6. — Uterine tumor resembling ovarian sex-cord tumor in a different 50-year-old patient, reproduced from Cho *et al.* [12] with permission. The pelvic MRI shows an approximately 8.7-cm, round, solid mass in the right anterolateral portion of the uterus. The mass is isointense on T1-weighted image (6A) and hyperintense on T2-weighted image (blue circle on 6B) relative to the rim of myometrium (red arrows on 6B). The mass also contains cystic portions which are slightly hypointense on T1-weighted image and hyperintense on T2-weighted image (orange arrow on 6B). The solid portion demonstrates hyperenhancement on post contrast T1-weighted image (5C). The solid portions of the tumor shows slightly restricted diffusion which appears hyperintense on the diffusion-weighted image and hypointense on the corresponding apparent diffusion coefficient (ADC) map (green arrow 6D and 6E).

tumor was confined to the uterus at the right fundus and that the remainder of her pelvic anatomy appeared within normal limits (Figure 5). She underwent an exploratory laparoscopy with pelvic washings, laparoscopic retroperitoneal dissection, bilateral salpingectomy, total laparoscopic hysterectomy, and left ovarian cystectomy. During laparoscopy she was found to have evidence of endometriosis and extensive vascularity to the uterus. She had an uncomplicated operative and postoperative course.

Pathologic examination of the hysterectomy specimen revealed a 3.1-cm UTROSCT involving the endomyometrium. While the histomorphological features of the tumor were similar to the prior biopsy specimen, without significant cytological atypia, necrosis, or mitotic activity, the tumor showed focally irregular growth margins and focal intralymphovascular growth (Figure 3D). The serosal surface, cervix, and fallopian tubes were not involved by tumor. Peritoneal cytology was negative for tumor. In addition, she had a benign hemorrhagic cystic follicle in the left ovary and a benign endocervical polyp.

Her case was discussed at the multidisciplinary tumor board. The decision was made for her to have close observation status post surgical removal. Her next surveillance visit is three months postoperatively.

Discussion

Uterine tumors with sex cord like elements are categorized into two groups: group I or endometrial stromal tumors with sex cord-like elements (ESTSCLE), and group II, or UTROSCT. These tumors are grouped based on their clinical and histopathological features. ESTSCLE predominantly contains endometrial stromal cells with sex cord-like aggregates comprising < 50% of the mass, whereas UTROSCT are comprised of primarily or exclusively with sex cord-like cells [2, 3]. There are approximately 70 cases of this tumor currently reported in the literature [4].

UTROSCT typically present in perimenopausal or postmenopausal women as abnormal uterine bleeding [5]. Pelvic pain has also been reported by patients, but is not a predominant feature [3, 6]. These tumors are generally benign, but have also rarely been reported to metastasize and recur after treatment [7, 8]. Anatomically, UTROSCT are typically found in the uterine body or fundus, but has also been reported in the cervix [9]. The gross appearance of UTROSCT is usually of a well-circumscribed, but unencapsulated mass that has a tan or yellow color on cross section [6]. UTROSCT have a diverse immunohistochemical profile, and are variably positive to epithelial markers such as pancytokeratin and epithelial membrane antigens, smooth muscle markers, such as desmin, actin, and markers of sex cord differentiation such as inhibin, calretinin, CD99, WT-1, MART-1, and melan-A. They are also often positive for ER and PR receptors. Other miscellaneous markers like CD10, S100, and CD117 can also be positive in UTROSCT [3, 4, 6, 9]. A diagnosis of UTROSCT is made based on typical histologic features and when positive staining of sex cord differentiation markers (calretinin, melan-A, CD56, CD99, and inhibin), desmin, cytokeratin, and CD10, to distinguish this tumor from smooth muscle neoplasms and others. UTROSCT is differentiated from ESTSCLE by > 50% or exclusively containing cells of sex cord differentiation [10]. JAZF1/SUZ12 fusion (JAZF1-JJAZ1) and PFH1 gene rearrangements that are observed in endometrial stromal tumors have not been reported in UTROSCT [11].

There has been scant imaging description of this tumor without specific imaging features [5, 12]. Previous sonographic descriptions of this tumor include smooth-margined, heterogeneously echoic solid mass, with one or more internal anechoic cystic portions [12, 13]. On CT, UTROSCT are masses with well-circumscribed margins [14]. In the present case, the tumor is hyperenhancing (169 HU) relative to the uterine myometrium (107 HU). The mass cannot be reliably distinguished from myometrium on the 120 second post contrast images, with the mass measure 87 HU compared to the myometrium which measures 84 HU (Figure 5). There have been four reports of UTROSCT with MRI findings. These tumors are T1 hypointense or intermediate in signal compared to myometrium, and T2 intermediate but more often T2 hyperintense. The tumors enhances slightly after contrast administration [12,

15-17]. Neither the CT or MRI features can distinguish UTROSCT from uterine leiomyomas [18, 19]. However, Cho *et al.* reported slightly restricted diffusion of UTROSCT, which can be a differentiating factor from the typical leiomyoma (Figure 6) [12]. However, further research on the imaging characteristics of UTROSCT, particularly using diffusion weighted sequences are needed.

The biological behavior of these tumors appears generally favorable according to most sources. However, cases exhibiting local recurrence and metastases with malignant behavior have been described [20]. A systematic review of literature found that the disease-free survival rates for 43 cases of UTROSCT were 97.0%, 92.7%, and 69.7% at one, two, and five years, respectively [21]. Currently, there is no consensus on the management of this group of rare tumors. In the same systematic review, Blake *et al.* found no statistically significant difference in survival between patient who had hysterectomy and those who also had adnexectomy [21]. Given the rare possibility of metastasis, the authors believe surgical excision of the tumor with hysterectomy is appropriate. However, other authors have advocated for resection of the tumor alone, without hysterectomy as a treatment option, particularly in those patients who wish to conceive for family planning [22].

In summary, UTROSCT is a rare tumor that has been well-characterized using immunochemistry and cytogenetics. The imaging features of this tumor cannot reliably differentiate UTROSCT from other uterine masses such as leiomyomas, though they may demonstrate slight restricted diffusion on MRI. In view of a relatively limited numbers of the reported cases with long follow up, the behavior of these tumors, while generally appearing favorable, remains unclear.

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