Highly Cellular Leiomyoma Mimics A Malignant Small Round-cell Tumor: A Diagnostic Dilemma on Frozen Sections

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SUMMARY

Objective: Cellular leiomyoma is characterized by significantly increased cellularity and may mimic malignant tumors. Our aim was to differentiate these from other malignant small round-cell tumors.

Case Report: We report a case of cellular leiomyoma that mimicked a malignant small round-cell tumor upon frozen section examination.

Conclusion: Pathologists should be aware that highly cellular leiomyomas can mimic malignant tumors especially on frozen section analysis. [*Taiwan J Obstet Gynecol* 2010;49(2):203–205]

Key Words: cellular, frozen section, leiomyoma, round-cell tumor

Introduction

Cellular leiomyoma is a distinct histomorphologic variant of leiomyoma, defined by the World Health Organization as a leiomyoma with significantly greater cellularity than the surrounding myometrium [1]. These lesions can at times display predominantly round cells or a few spindle cells, and can be confused with other round-cell tumors of the female genital tract [2].

Case Report

A 19-year-old unmarried female presented with complaints of lower abdominal pain intermittently over 3 months. She had attained menarche at 13 years of age and had had regular menstrual periods every 30 days up until the last 3 months when she noticed irregular bleeding patterns. Physical examination was unremarkable except for mild lower abdominal tenderness. The vaginal examination was remarkable for a tender mass lesion felt through the vaginal fornix. Pelvic ultrasonography documented a mass lesion at the isthmic-cervical junction measuring 9.8 × 9.2 × 9.2 cm with a solid echotexture. Clinically, a suspicion of malignant soft tissue tumor was considered, and surgery and frozen section analysis were undertaken. Intraoperatively, the mass was visualized to have arisen from the upper cervical region and was externally congested with prominent dilated veins. Bilateral adnexa were unremarkable. The tumor was excised and sent for further analysis.

Grossly, a single, globular, mildly congested soft tissue measuring 10 × 10 × 9.5 cm was excised. The cut section was a gray-white solid mass with a single cystic area 1 cm in diameter filled with mucoid material. No areas of hemorrhage or necrosis were documented. Frozen sections from different areas revealed a cellular tumor composed predominantly of round cells arranged in sheets and nests, surrounded by variably thick hyalinized collagen bands. The cells had round hyperchromatic nuclei with small prominent nucleoli and scant cytoplasm (Figure A). Nuclear pleomorphism was mild, and mitoses were sparse. Possibilities of small round-cell tumor and uterine stromal tumor were suggested. Intraoperatively, the tumor appeared to be within the confines

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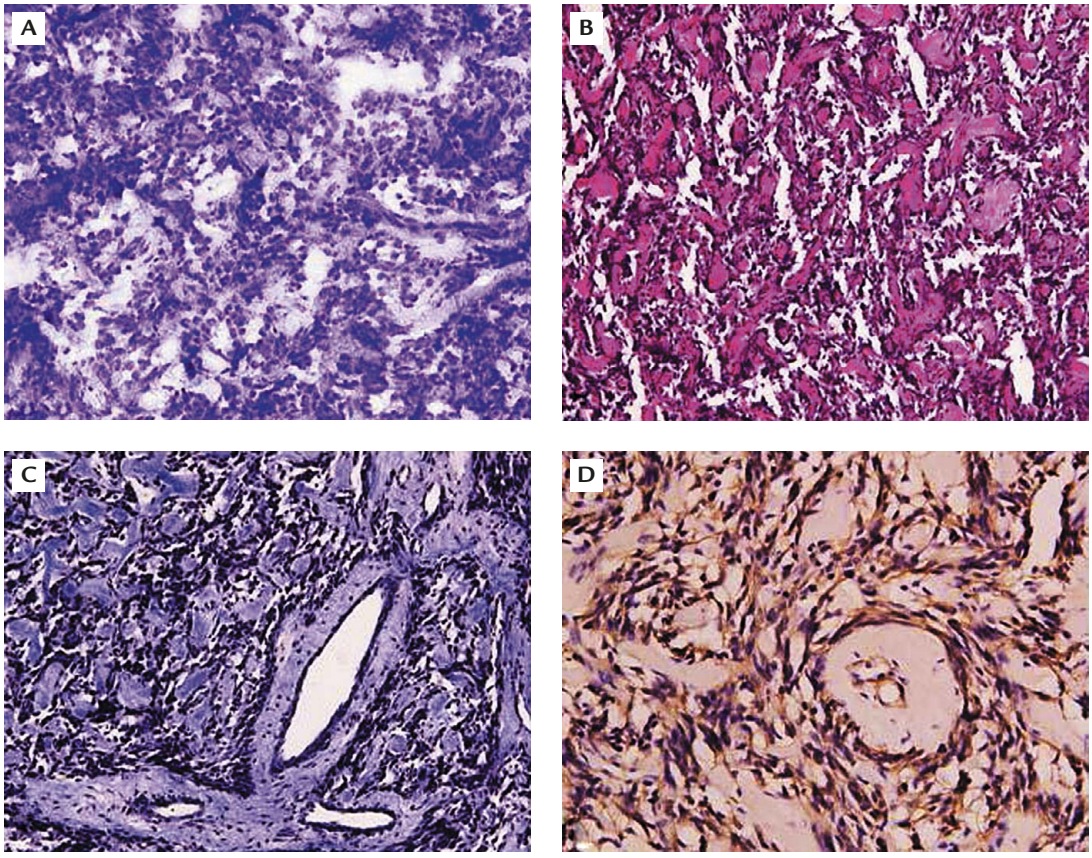

Figure. (A) Photomicrograph (original magnification ×200) of a toluidine blue-stained frozen section reveals round and oval hyperchromatic cells. (B) Histomorphology (original magnification ×200) of a hematoxylin and eosin-stained paraffin embedded section shows predominantly hyperchromatic spindle-shaped cells embedded in hyalinized stroma. (C) Masson trichrome stain highlighting stroma and thick-walled vessels (original magnification ×400). (D) Section immunostained for smooth muscle actin was strongly positive (original magnification ×600).

of the uterus without adhesions to the surrounding structures. No enlarged or abnormal lymph nodes were documented. Considering the young age of the patient and her desire to bear children, a wide local excision of the tumor was performed to preserve the uterus.

The hematoxylin and eosin-stained paraffin sections revealed similar findings: the cells appeared to be round, sometimes elongated, with a hyperchromatic nuclei, minimal nuclear pleomorphism and sparse mitotic figures. Groups of cells with no particular pattern of organization were interspersed by thick hyalinized collagen bundles (Figure B). The collagenous nature of these bundles was confirmed by Masson trichrome staining (Figure C). Numerous medium-sized vessels with thick hyalinized walls were also seen; these were randomly distributed in the tumor. No areas of hemorrhage or necrosis were seen in the tumor.

Immunohistochemically, the cells were intensely and uniformly positive for the presence of smooth muscle actin (Figure D) and desmin, confirming the smooth muscle origin of the tumor. A final diagnosis of highly cellular leiomyoma was given based on overall histomorphology and immunohistochemistry.

Clinically, the patient had an uncomplicated postoperative course. She was discharged from hospital after 7 days. After the dispatch of the histopathologic report, follow-up of her progress was conducted for 3 months with no further interventions required.

Discussion

As reported previously, highly cellular leiomyoma has been found to be located both intramurally as well as submucosally in the uterine corpus [1,2]. Microscopically, leiomyomas are characterized by a diffuse growth of packed small round cells with scant cytoplasm and lack of nuclear atypia. These highly cellular leiomyoma also harbor medium to small caliber arterioles with thick hyalinized walls. Most of these tumors were well circumscribed and did not show any evidence of infiltration into the surrounding myometrium [2]. The microscopic

picture is helpful in distinguishing a highly cellular leiomyoma from other small round-cell tumors, and is based on the documentation of the thick muscular or hyalinized vessels [1,2]. Our case also had similar findings from routine paraffin hematoxylin and eosin sections, which showed a diffuse compact proliferation of round to spindle cells dispersed in a hyalinized stroma and with numerous vessels with thick hyalinized walls. The cells had small hyperchromatic nuclei lacking atypia or mitosis and did not show any infiltration into the surrounding myometrium. No areas of necrosis were documented. In this case, the final diagnosis was based on histomorphologic findings of thick-walled hyalinized vessels, and a diffuse strong positivity of tumor cells for smooth muscle actin and desmin. Diffuse strong positivity for desmin has been documented in the literature to be of diagnostic help [1].

Highly cellular leiomyomas do not have a distinct clinical presentation. They are benign, uncommon variants of the usual leiomyoma and have a good outcome. The treatment approach for patients with cellular leiomyoma depends on the clinical picture, histopathology, and the patient's desire to bear children [1]. In situations in which the woman is either older, or young with no interest in future fertility, a diagnostic hysterectomy is advocated [1]. Recently, uterine artery embolization or endometrial ablation techniques have been used in older patients [3,4]. However, our patient was a young woman who wished to retain her fertility; thus, surgery was performed to preserve reproductive function.

Pathologists need to be aware that a cellular leiomyoma can harbor atypical morphology such that it mimics a small round-cell tumor, especially in frozen section analysis. Careful histomorphologic analysis, employing immunohistochemistry, can be extremely helpful in establishing a definite diagnosis.

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