

Case report

Proposed novel nomenclature of vulvar smooth muscle tumors; a case of Smooth Muscle Tumor of Uncertain Malignant Potential (STUMP) of the vulva



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1. Introduction

Smooth muscle tumors of the vulva are uncommon. (Nucci and Fletcher, 2000) Leiomyomas are the most prevalent smooth muscle tumors of the vulva. (Nielsen et al., 1996) They occur predominantly in premenopausal women, typically in the fourth and fifth decades. (Mills and Longacre, 2009; Nucci and Fletcher, 2000) The usual presentation is a painless mass, generally arising in the labia majora. (Newman and Fletcher, 1991; Nielsen et al., 1996) The majority are benign, but among these tumors a few will recur locally. (Mills and Longacre, 2009; Nielsen et al., 1996) Vulvar leiomyosarcomas, their malignant counterparts, are especially rare, accounting for only 1% of all primary malignancies of the vulva. (Curtin et al., 1995; DiSaia and Pecorelli, 1994; Tavassoli and Norris, 1979)

Because smooth muscle tumors of the vulva are infrequent and long-term follow-up is often lacking, classification of these tumors according to their recurrence potential is difficult. (Nucci and Fletcher, 2000) We report a case of smooth muscle tumor of the vulva with ambiguous histological features and discuss the criteria that distinguish benign from

malignant tumors. A novel nomenclature for smooth muscle tumors of the vulva with atypical histological features, Smooth Muscle Tumor of Uncertain Malignant Potential (STUMP), is then proposed.

2. Case

A 34-year old Caucasian patient, G₃, P₂, A₁, was seen at our gynecologic oncology clinic for a vulvar mass. Past medical history was uneventful. She reported that the mass had been present in her right labium majus for many years. However, she noted a recent enlargement. The mass caused light discomfort, but was not painful and did not produce discharge.

On physical examination, a mass was seen bulging in the right superolateral aspect of the vagina. The tumor was located in the right labium majus, in proximity of the urethral meatus. The overlying skin was intact. At palpation, the mass appeared mobile. Colposcopic evaluation was performed to exclude any other lesion of the lower genital tract. Bimanual examination revealed normal uterus, cervix and adnexa.

A preoperative pelvic magnetic resonance imaging (MRI) was performed and demonstrated a 3.7 × 2.4 × 2.3 cm bilobed solid lesion in the right labium majus (Fig. 1). The subcutaneous lesion extended posteriorly close to the urethral meatus and was adjacent to the right anterior vaginal wall. Its superior border was close to the pubic symphysis. There was no evidence of infiltration in the adjacent tissues. The uterus and adnexa appeared normal. No lymph node enlargement was noted.

Surgical removal of the mass was recommended. The patient underwent wide local excision of the vulvar mass under general anesthesia. To begin, a 2-cm incision was made in the right interlabial fold. Then, owing to smooth cleavage planes, blunt dissection was easily performed to free the mass from surrounding tissues. Scant vascular pedicles were ligated. Surgery allowed complete resection of the bilobed tumor. Finally, the tissues and overlying skin were reapproximated with interrupted delayed-absorbable sutures. No groin lymph node dissection was performed. Estimated blood loss was 25 cm³. Intraoperative frozen section analysis was performed and a diagnosis of smooth muscle tumor was given. However, it was impossible to conclude on its malignant potential on cryosection. There was no intraoperative or postoperative complication.

Macroscopically, the lesion measured 4.3 × 3.0 × 2.5 cm. The tumor was encapsulated, and the external surface was smooth. On cut section,

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Fig. 1. Pelvic MRI showing the bilobed lesion (arrow) in the right labium majus.

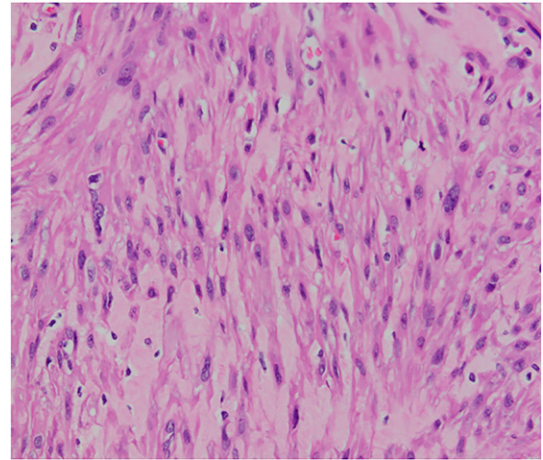


Fig. 3. Spindle-shaped cells with nuclear atypia (40×).

the color was beige-gray. It was firm, slightly fasciculated and homogeneous with no obvious haemorrhage or necrosis.

On microscopic examination, the tumor was nodular with well-demarcated borders and a fascicular architecture (Fig. 2). The cells were spindle-shaped with multifocal moderate cellular atypia characterized by nuclear pleomorphism, large nuclear size and nuclear membrane irregularities, coarsening of chromatin texture and multinucleation (Fig. 3). Mitotic activity was insignificant, with an average mitotic count <1 per 10 high-power fields (HPF). The highest mitotic count was 2 per 10 HPF. There was no tumor cell necrosis. Excision margins were free of disease.

Immunohistochemical analysis was performed. Smooth muscle markers desmin, actin-muscle specific, smooth-muscle actin and h-caldesmon were positive (Fig. 4). Mesenchymal marker vimentin was also positive. Cytokeratins AE1/AE3 did not stain, while epithelial membrane antigen was only focally positive. The absence of CD34, MDM2, S-100 and STAT6 was useful to rule out other types of sarcomas that may occur on the vulva such as malignant peripheral nerve sheath tumor, liposarcoma, Kaposi sarcoma, fibrosarcoma, dermatofibrosarcoma protuberans or solitary fibrous tumor.

The pathological analysis was compatible with a Smooth Muscle Tumor of Uncertain Malignant Potential (STUMP) of the vulva.

Our multidisciplinary tumor board recommended no adjuvant therapy. The patient received no further treatment and was offered close follow-up. At follow-up, the patient is still disease-free five months after surgery.

3. Discussion

Most clinical experience with smooth muscle tumors of the female genital tract comes from tumors found in the uterus. Criteria for uterine leiomyosarcoma have been well established. However, this classification of smooth muscle tumors is based on site-specific criteria and cannot be applied to smooth-muscle tumors arising elsewhere in the female genital tract. (Nielsen et al., 1996; Nucci and Fletcher, 2000)

Smooth muscle tumors are rare in the vulva. Thus, it has been difficult to establish diagnostic criteria from clinical observation to predict their behavior. Many classification systems have been proposed.

In 1979, Tavassoli and Norris studied the clinical and pathological features of 32 smooth muscle tumors of the vulva and proposed criteria to distinguish leiomyomas from leiomyosarcomas. Only four tumors recurred. Nevertheless, histological features related to prognosis were identified: infiltrating margins, 5 or more mitotic figures per 10 HPF and lesion size 5 cm or larger. A tumor with two criteria was designated as a low-grade leiomyosarcoma. According to this study, a diagnosis of leiomyosarcoma would only apply to tumors presenting all three criteria or with metastasis. (Tavassoli and Norris, 1979) With these criteria, the tumor presented in this case report would have been classified as a leiomyoma.

Based on the review of 25 cases, Nielsen and colleagues (Nielsen et al., 1996) also proposed diagnostic criteria for smooth muscle tumors of the vulva. Despite an average follow-up of five years, only three patients experienced local recurrence and one patient died of metastases.

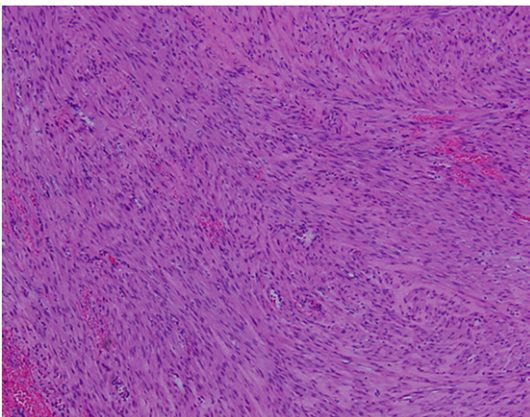


Fig. 2. Tumor with fascicular architecture (10×).

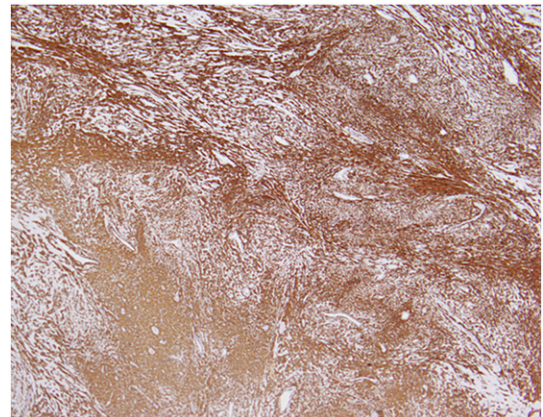


Fig. 4. Tumor was positive for Caldesmon (10×).

Of particular interest, three of the four recurrent or metastatic tumors reported by Nielsen presented moderate to severe cytologic atypia. In contrary, all four cases of recurrent tumors reported by Tavassoli only showed mild atypia, so Tavassoli concluded that the degree of cellular atypia did not correlate with prognosis nor with the mitotic activity. (Tavassoli and Norris, 1979) However, cytologic atypia is known to be associated with recurrence in uterine and vaginal smooth muscle tumors. (Bell et al., 1994; Mills and Longacre, 2009)

Nielsen (Nielsen et al., 1996) suggested histological criteria that were identical as those proposed by Tavassoli (Tavassoli and Norris, 1979), but added moderate to severe cytologic atypia. A tumor without or with one of these characteristics, such as the case presented herein, should be diagnosed as benign leiomyoma, while a tumor with three or four features was classified as a leiomyosarcoma. An intermediate category, atypical leiomyoma, was named for tumors with two ambiguous histologic features for malignancy.

In a review on vulvovaginal soft tissue tumors, Nucci and Fletcher addressed the difficulty of reliably predicting recurrent potential of smooth muscle tumors of the vulva, due to the scarcity of these tumors and the limited follow-up available. They agreed with the criteria used by Nielsen to diagnose a sarcoma, but mentioned that the presence of coagulative tumor necrosis is also a feature that should seriously raise the possibility of sarcoma. (Nucci and Fletcher, 2000) In their opinion, any mitotic activity, nuclear pleomorphism or the presence of an infiltrative margin is associated with a potential for late local recurrence, regardless of the size of the tumor. For this reason, they suggested the name “atypical smooth muscle tumor” for lesions not fulfilling the criteria for the diagnosis of sarcoma, but presenting any of these features. In their opinion, wide local excision with at least a 10 mm margin is the recommended treatment in all cases of atypical smooth muscle tumor. This opinion is in agreement with Nielsen and Young who suggested that leiomyomas with atypical features should be addressed surgically with clear margins. However, inguinal node dissection is not routinely performed. Long-term follow-up is advised. (Nielsen and Young, 2001)

The tumor presented by our patient could therefore be called an “atypical smooth muscle tumor” based on the moderate atypia. In our opinion, the appellation “Smooth Muscle Tumor of Uncertain Malignant Potential” (STUMP) would be more appropriate, as it suggests the lesion can be associated with recurrence. Indeed, an example of a similar tumor that subsequently recurred can be found in the literature. (Nucci and Fletcher, 2000) As in our case, the tumor described by Nucci and Fletcher was well circumscribed, did not have mitoses or necrosis but only had nuclear polymorphism. However rare, recurrence is thus possible with a smooth muscle tumor of the vulva showing nuclear atypia. The term STUMP also emphasizes that clinical experience is too limited to predict their aggressive potential. For instance, Nielsen reported one case of a malignant transformation of a previously benign smooth-muscle tumor of the vulva. (Nielsen et al., 1996) Additionally, Nucci and Fletcher (Nucci and Fletcher, 2000) reported that these tumors, when recurring, often show additional worrisome histological features, so wide reexcision of recurrent tumor is advised. (Nielsen et al., 1996)

Another argument supporting the nomenclature STUMP in vulvar smooth muscle tumors is to harmonize the classification with those arising in the uterus. Indeed, Bell et al. (Bell et al., 1994) studied their uterine counterparts and divided uterine smooth muscle tumors with unequivocal characteristics into three different categories based on moderate to severe atypia, mitotic activity and tumor cell necrosis. They were respectively named “atypical leiomyomas with low risk of

recurrence”, “atypical leiomyoma but experience limited”, and “smooth muscle tumors of low malignant potential”. Later, the term STUMP has been adopted in uterine smooth muscle tumors without all criteria for leiomyosarcomas, but with some features concerning for malignancy. (Clement, 2000; Mills and Longacre, 2009) Use of this term in the literature concerning vulvar smooth muscle tumors would thus allow a better uniformity and interpretation of the pathological analysis by clinicians.

4. Conclusion

Clinical experience is scarce concerning smooth muscle tumors that occur in the vulva. More data is required to improve knowledge on prognostic factors, clinical evolution and optimal management of these rare tumors of the vulva. Some lesions express challenging histopathologic features that are not unequivocally benign or malignant. Concerning features include size, infiltrating margins, mitotic activity, cytologic atypia, and tumor cell necrosis. We suggest the term vulvar “Smooth Muscle Tumor of Uncertain Malignant Potential” to designate tumors with histologic features not sufficiently clear to allow classification into benign or malignant categories. Considering the small number of cases and limited available follow-up data, their long-term clinical behavior remains to be established. The clinicians should be aware that these lesions can present late relapse, thus a careful long term follow-up is advised.

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Conflict of interest

No conflicts of interest to disclose.

Role of funding sources

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