REVIEW AND CASE SERIES

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Vaginal leiomyoma: a rare vaginal tumor

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Abstract

Background/Objectives: While uterine leiomyomas are one of the most common pathologies encountered in gynecology, myomas arising from the vagina are rarely identified and a limited number of cases have been reported so far. With variable locations, diagnosis and surgical treatment of the vaginal leiomyoma can be challenging. *Case presentations*: We present two cases of vaginal myomas. The first case was of a 43-year-old patient who presented dyspareunia. Clinical examination revealed a vaginal mass, of 2/1 cm, located on the posterolateral left vaginal wall. Ultrasound showed a well confined, hyperechogenic round mass. After vaginal excision and histopathological analysis, the final diagnosis was established – vaginal leiomyoma. The second patient presented it for a routine gynecological examination. A firm nodule was palpated in the posterior vaginal fornix. After transvaginal excision, the diagnosis was histopathologically confirmed – vaginal myoma. *Conclusions*: Whenever confronted with a vaginal mass, the diagnosis of a vaginal myoma should be kept in mind, as transvaginal excision is the preferred surgical treatment.

Keywords: vaginal leiomyoma, vaginal tumor, leiomyoma, vaginal, tumor.

Introduction

Vaginal leiomyomas are exceptionally rare benign smooth muscle tumors, representing one of the least common mesenchymal lesions of the female genital tract [1]. In contrast to uterine leiomyomas (which constitute the most prevalent gynecological tumors), leiomyomas arising from the vaginal wall have a much lower incidence, with less than 300 cases documented worldwide since their first description in the 18th century [2]. Their true incidence is difficult to establish due to the scarcity of reported cases and the likelihood of underdiagnosis, but available literature consistently portrays them as uncommon findings, typically affecting women in their third to fifth decades of life [3, 4].

Clinically, vaginal leiomyomas exhibit a wide range of presentations that depend on their size and anatomical location. Small lesions may remain entirely asymptomatic and be detected incidentally during pelvic examination. Larger tumors, however, frequently produce nonspecific symptoms such as pelvic or vaginal discomfort, dyspareunia, or the sensation of a mass. Depending on their proximity to the urethra or bladder, patients may also report urinary frequency, dysuria, recurrent infections, or obstructive symptoms [5]. In some cases, the tumor may protrude toward or beyond the vaginal introitus, mimicking pelvic organ prolapse. Because these symptoms overlap with more common vaginal or periurethral conditions (vaginal cysts, Gartner duct remnants, Bartholin gland pathology, urethral abnormalities), clinical misinterpretation is frequent.

Despite their occasionally significant size and symptom burden, vaginal leiomyomas are benign lesions with an excellent prognosis. Malignant transformation is exceedingly rare, and complete surgical excision is typically curative, with recurrence being uncommon. Nonetheless, their rarity and variable clinical presentation impose this pathology in the vaginal masses differential diagnosis to ensure appropriate management.

Study selection for review

This review was conducted to summarize and analyze the scientific literature on vaginal leiomyomas, with emphasis on frequency, number of cases reported, clinical presentation, morphopathological features, and management strategies. A

thorough literature search was performed in the following databases: *Web of Science*, *PubMed* and *Scopus*. The analysis included all articles published up to January 2025. The search terms were represented by "vaginal leiomyoma", "vaginal fibroid", "vaginal smooth muscle tumor", "leiomyoma of the vagina", "paraurethral leiomyoma", and "vaginal mesenchymal tumor". No language restrictions were initially applied. Additionally, the references of all initially identified articles were manually reviewed to select relevant publications that were not initially found by the automated search.

Inclusion criteria

Publications with the following characteristics were included in the analysis: reported one/more cases of vaginal leiomyoma; provided clinical data describing signs, symptoms, or physical examination findings; contained pathological or histological confirmation of the diagnosis; represented original clinical material, including case reports, case series, retrospective analyses, or reviews summarizing documented cases.

Exclusion criteria

The following were excluded: articles without primary clinical data (*e.g.*, editorials without case descriptions); reports lacking histopathological (HP) confirmation; studies with insufficient patient information; animal studies or experimental models.

Data extraction

From each eligible publication, the following data were analyzed: author(s); publication year; publication country; number of cases reported; patient demographics (age); tumor size and anatomical location; presenting symptoms and clinical findings; intraoperative findings; HP characteristics; treatment performed; recurrence or follow-up data (when available).

Due to the rarity of vaginal leiomyomas and the predominance of isolated case reports, a quantitative meta-analysis was not feasible. Therefore, a qualitative, narrative synthesis was performed to integrate findings across studies, highlight common clinical patterns, and identify trends in presentation and management.

Clinical manifestations

The clinical presentation of vaginal leiomyomas varies widely and is influenced primarily by the size, location, and growth pattern of the tumor. Many lesions remain asymptomatic, particularly when small, and are discovered incidentally during routine pelvic examination. Symptomatic cases, however, manifest a spectrum of gynecological and urinary complaints due to the tumor's mass effect on adjacent structures.

The most frequently reported symptom is dyspareunia, often resulting from distortion or focal thickening of the vaginal wall [6]. Patients may also experience pelvic or vaginal discomfort, localized pressure, or non-specific pelvic pain, reflecting progressive enlargement of the tumor [7]. Vaginal bleeding, although less common, may occur when the overlying mucosa becomes irritated or ulcerated [8]. A subset of patients presents with a palpable or protruding mass, particularly when the leiomyoma projects toward the vaginal lumen or introitus, creating a sensation often mistaken for pelvic organ prolapse [9–11].

Tumors located on the anterior vaginal wall can compress the urethra or bladder neck, leading to urinary symptoms such as dysuria, frequency, urgency, difficult voiding, or recurrent urinary tract infections [12, 13]. These symptoms closely resemble those associated with urethral diverticula, cystoceles, or paraurethral masses, contributing to diagnostic ambiguity [14]. Vaginal cysts of different etiologies might also have to be excluded, such as Gartner cyst, other congenital cysts, Bartholin cyst or inclusion cyst [15]. In rare instances, degenerative changes of the leiomyoma (including ischemia, hemorrhage, or cystic transformation) may produce acute pelvic pain [16].

Although benign in their natural course, vaginal leiomyomas can significantly impact quality of life due to their anatomical position and the sensitive functional roles of the vaginal and periurethral structures. The wide range of possible clinical manifestations underscores the importance of maintaining a high index of suspicion, particularly when evaluating unexplained vaginal or paraurethral masses. The most important diagnosis to be excluded remains a vaginal malignancy. It can be particularly difficult when the myoma undergoes degeneration and ulceration and in some cases needle biopsy may be a useful tool for pre-operative management [17]. Also, a suspicion for metastasis or tumor extension should be raised in patients with hysterectomy for cervical neoplasia or leiomyosarcoma [18].

Imagistic features

Ultrasound (US) is the first imaging investigation for vaginal tumors assessment before surgery [19]. On trans-vaginal ultrasound (TVUS), these tumors typically appear as well-defined, solid, hypoechoic lesions arising from the vaginal wall [19]. Their US structure is usually homogeneous, although mild heterogeneity can be observed in tumors with degenerative changes [19]. The margins tend to be smooth and sharply demarcated from the surrounding tissues, reflecting their benign and often encapsulated nature [19]. Color Doppler interrogation generally reveals minimal or peripheral vascularity, consistent with their slow growth pattern; however, increased vascular flow may be present in larger lesions or those with active growth [19].

Depending on the size and direction of extension, vaginal leiomyomas may displace adjacent anatomical structures (cervix, bladder neck or urethra), a feature that may aid localization during sonographic evaluation. Degenerative changes, although less common than in uterine leiomyomas, can alter their sonographic appearance [20]. Hyaline or myxoid degeneration may introduce areas of low-level internal echoes or cystic spaces, while hemorrhagic changes may lead to mixed echogenicity [20]. Calcifications, when present, appear as hyperechoic foci with posterior acoustic shadowing [20].

US is especially useful in differentiating vaginal leiomyomas from cystic lesions, which typically exhibit anechoic contents and thin walls. Nevertheless, overlapping in appearance with other solid vaginal masses (such as paraurethral tumors, fibroepithelial stromal polyps, or even malignant lesions) means that US findings should be interpreted in clinical context [19, 20]. Despite its limitations in definitive tissue characterization, US remains an accessible,

non-invasive, and highly informative tool that contributes significantly to the initial identification and characterization of vaginal leiomyomas [19, 20].

On magnetic resonance imaging (MRI), vaginal leiomyomas typically demonstrate characteristics similar to uterine leiomyomas [21]. They most commonly exhibit T1 images with intermediate signal intensity and T2 images with low to intermediate signal intensity, reflecting dense smooth muscle composition [21]. Well-circumscribed margins are generally present, consistent with their benign nature [21]. Following administration of gadolinium-based contrast, these tumors usually show homogeneous enhancement, although areas of heterogeneous or delayed enhancement may be seen in larger lesions or those with degenerative changes [21].

Degenerative processes, although less frequent than in uterine counterparts, can modify MRI signal characteristics [21, 22]. Hyaline degeneration may produce regions of low T2 signal, whereas cystic or myxoid degeneration can result in foci of high T2 signal intensity [21, 22]. Hemorrhage within the tumor may increase T1 signal intensity, contributing to a more heterogeneous appearance [21, 22]. Tumors with significant vascularity may display early avid enhancement, while those with limited vascular supply may enhance more gradually [21, 22].

MRI is particularly useful for differentiating vaginal leiomyomas from malignant tumors such as leiomyosarcomas [22]. Malignant lesions often appear more heterogeneous, with irregular borders, areas of necrosis, and high T2 intensity zones, representing cellular atypia or hemorrhage [22]. Furthermore, MRI aids in assessing the tumor relationship with the adjacent anatomical structures (including the urethra, bladder, rectum, and paravaginal tissues), information that is crucial for surgical planning [22].

Although MRI is not required for every case, its role is especially important when the lesion is large, displays atypical features, or raises concern for malignancy. By providing detailed morphological and tissue characterization, MRI significantly improves diagnostic confidence and optimizes individualized management strategies for patients with vaginal leiomyomas.

Morphopathological features

Vaginal leiomyomas share the same fundamental HP characteristics as leiomyomas arising in other smooth muscle-rich tissues. Grossly, they typically appear as well-circumscribed, firm, round or ovoid nodules with a smooth external surface and a homogeneous, whorled cut surface [23]. Microscopically, they are formed by intersecting uniform fascicles of smooth muscle cells with cytoplasm containing eosinophils and blunt-ended ("cigar-shaped"), elongated nuclei [23]. Mitotic activity is usually reduced, and no significant cytological atypia is present [23]. Although vaginal leiomyomas are benign in most cases, degenerative changes such as hyalinization, cystic degeneration, edema, or, less commonly, calcification may occur, especially in larger tumors [23]. The stroma often contains variable amounts of collagen and may show areas of sclerosis [24, 25]. Immunohistochemically, vaginal leiomyomas demonstrate smooth muscle markers [smooth muscle actin (SMA), desmin, and caldesmon] increased positivity, confirming their myogenic origin [24, 25]. The Ki67 proliferation index is typically low, supporting their indolent growth pattern [24, 25]. The main pathological challenge lies in differentiating these tumors from other mesenchymal lesions of the vagina (such as aggressive angiomyxoma, cellular angiofibroma, or leiomyosarcoma), conditions in which infiltrative margins, increased mitotic activity, nuclear atypia, or necrosis may raise suspicion for malignancy [24]. Careful morphological assessment complemented by immunohistochemistry is therefore essential for establishing a definitive diagnosis [25].

Treatment

The management of vaginal leiomyomas is determined by the presence of symptoms, tumor size, anatomical location, and the degree of diagnostic certainty regarding benignity [26]. Because these tumors are usually benign and typically slow-growing, small asymptomatic lesions may be monitored conservatively; however, observation alone cannot definitively exclude malignancy, and ongoing follow-up is recommended for patients managed expectantly.

Surgical excision remains the standard and preferred treatment for most cases [26]. Transvaginal excision is the approach of choice, offering direct access to the tumor, minimal morbidity, and excellent cosmetic and functional outcomes [26]. The procedure generally involves a mucosal incision over the point of maximal protrusion, followed by careful dissection and enucleation of the mass [26]. Leiomyomas are typically well circumscribed, which facilitates complete removal with preservation of surrounding tissues [26]. Hemostasis is achieved with simple suturing techniques, and postoperative recovery is usually rapid [26].

In cases where the tumor is large, extends into paravaginal or periurethral tissues, or has an atypical orientation, alternative surgical approaches may be required [27]. These include transperineal, transabdominal, or combined approaches, although such instances are rare [27]. Urethral involvement may necessitate careful dissection to avoid injury, and when the tumor compresses or displaces the urethra, a Foley catheter is often placed perioperatively for urethral protection and to ensure adequate urinary drainage [27].

Malignancy is exceedingly uncommon in vaginal smooth muscle tumors; however, features suspicious of aggressive behavior (such as rapid growth, irregular consistency, ulceration, or cytological atypia) should prompt more extensive surgical planning and consideration of oncological evaluation [25, 28]. In uncertain cases, an intraoperative frozen section may be used to guide the surgical extent [25, 28].

Postoperative outcomes are generally excellent [29]. Recurrence is rare following complete excision, and most patients experience full resolution of symptoms [29]. Complications such as infection, hematoma, or dyspareunia are uncommon, and extended-term follow-up is recommended primarily for identifying recurrences or to re-evaluate any new symptoms that arise [29].

Overall, the treatment of vaginal leiomyomas is straightforward and highly effective, with surgery providing definitive diagnosis, symptom relief, and prevention of future complications.

Case presentations

Case No. 1

We present a 43-year-old premenopausal patient who presented to Prof. Dr. Panait Sîrbu Clinical Hospital of Obstetrics and Gynecology (Bucharest, Romania) for dyspareunia. This patient was gesta three and para one and had given birth by cesarean section 15 years earlier. She received treatment for Lyme disease eight years prior to the current presentation. Previous gynecological examinations did not reveal anything notable, and she had a normal Pap smear in the same year.

Firstly, clinical examination was performed. Inspection of the external genitalia revealed no modifications. On Kristeller vaginal speculum (valve) examination, the vaginal mucosa, vaginal discharge and the cervix appeared normal, but a vaginal tumor was observed. It was located on the posterolateral left vaginal wall, in the cranial third of the vaginal canal, with a size of approximately 2 cm, covered by normal mucosa. On bimanual palpation, the tumor previously described was palpated and identified as a 2/1 cm mass, roundly shaped, mobile, with a firm consistency. The uterus was normal in shape and size. The adnexal regions and vaginal fornixes revealed no masses.

The consultation continued with a US examination. As expected from the clinical examination, the uterus showed no pathological findings. The US evaluation of the vagina confirmed the presence of the palpated mass. The vaginal tumor measured 1.52/1.46 cm, with a well-defined contour, a hypoechoic, slightly non homogenous appearance, and a minimal peripheral vascularization on color Doppler (Figure 1).

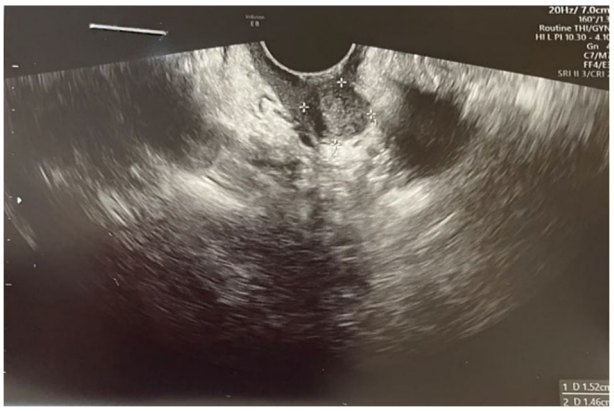

Figure 1 – ***Ultrasonographic appearance of the vaginal tumor: well-defined contour; hypoechoic, slightly non-homogenous aspect.***

Considering the patient's symptoms, vaginal excision of the tumor was decided. Under general intravenous anesthesia and with a Foley catheter inserted, a 3 cm transversal incision of the vaginal mucosa was performed, centered on the area of maximum prominence of the described mass, and the tumor was enucleated (Figure 2, A and B). After hemostasis control, the vaginal mucosa was closed with a 2-0 Polyglycolic Acid (PGA) thread running suture. The patient recovered with no complications and was discharged the next day. She presented at the six weeks follow-up free of symptoms.

Histopathological findings

The macroscopic HP exam described the surgical specimen presented as a well-circumscribed, firm, round to ovoid nodule, with a diameter of 1.5 cm, with an external surface of smooth aspect.

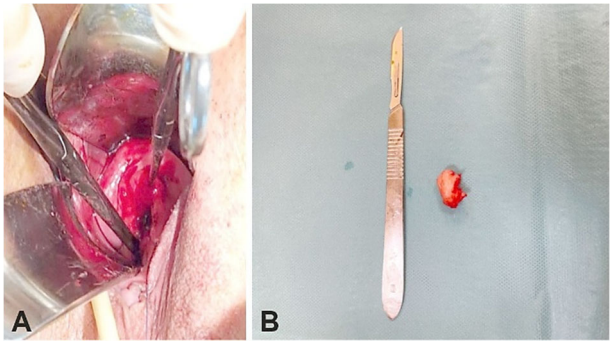

Figure 2 – ***Intraoperative aspects: (A) Tumor before enucleation; (B) Tumor after enucleation.***

The microscopic features were similar to leiomyomas found in other locations. The tumor formation was mainly composed of smooth muscle cells characterized by distinct cell boundaries, arranged in intersecting bundles. The cells had a uniform appearance with "cigar-shaped", elongated nuclei and low to moderate concentration of eosinophilic cytoplasm. The nuclei showed a blunt-end ("cigar-shaped") and minimal atypia with little mitotic activity. There were not identified any necrotic areas or significant cytological atypia. The stroma showed areas of sclerohyaline remodeling, with a more glassy and acellular pattern. The vascular structures present were well-formed, with thick walls and minimal hyperemia.

We performed an immunohistochemical (IHC) study (Figure 3, A–F) that confirmed leiomyoma and the smooth muscle origin of the cells: caldesmon, desmin and SMA were all positive. Ki67 (which is a marker of proliferation) was low (about 5%), consistent with the slow-growing nature of the tumor. Progesterone receptor (PR) was present in about 40% of the tumor cells. Ki67 was identified in about 5% of the tumor cells. Also, estrogen receptor (ER) was present in about 70% of the nuclear cells. SMA, caldesmon and desmin were diffusely positive in tumor cells.

Case No. 2

A 44-year-old woman, gesta three para one, with one previous Caesarean birth and two prior abortions, presented to Prof. Dr. Panait Sîrbu Clinical Hospital of Obstetrics and Gynecology (Bucharest, Romania) for routine gynecological evaluation. She had no known medical conditions and reported no gynecological symptoms at the time of examination.

On Kristeller vaginal speculum (valve) inspection, the cervix appeared normal, and the vaginal mucosa showed no visible abnormalities. Bimanual examination revealed an enlarged uterus, corresponding to approximately a nine-week gestational size, with a firm consistency. Additionally, a mobile, firm, well-defined nodule measuring about 1 cm was palpated in the posterior vaginal fornix.

TVUS demonstrated sonographic features typical of adenomyosis, including a heterogeneous myometrial echotexture and small myometrial cystic areas. The clinically palpated nodule was also visualized sonographically in the posterior vaginal fornix as a well-circumscribed, hypoechoic mass of 1/0.5 cm with imaging characteristics suggestive of a leiomyoma.

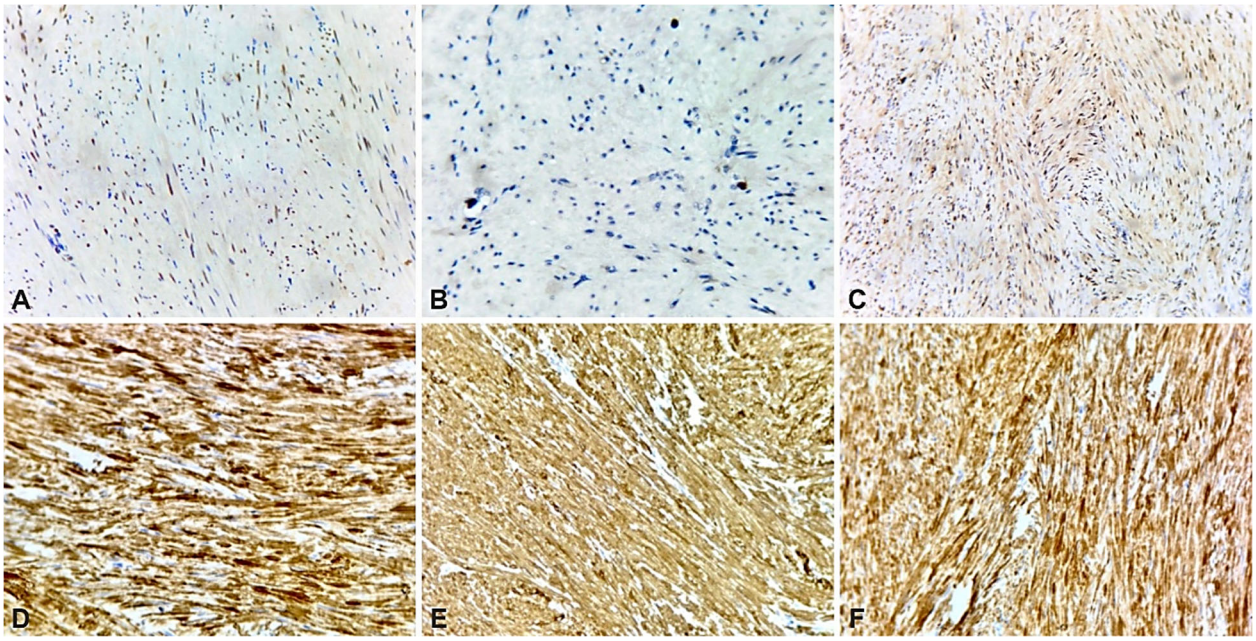

Figure 3 – ***IHC study confirmed leiomyoma and the smooth muscle origin of the cells (×100): (A) PR; (B) Ki67; (C) ER; (D) SMA; (E) Caldesmon; (F) Desmin. ER: Estrogen receptor; IHC: immunohistochemical; PG: Progesterone receptor; SMA: Smooth muscle actin.***

Given the findings, the patient underwent surgical excision of the vaginal mass. Under general intravenous anesthesia, the tumor was excised using a technique similar to that described in the previous case. Postoperative evolution was favorable, with the patient being discharged the following day. Postoperative two months check-up revealed optimal healing of the vaginal mucosa and the absence of symptoms.

Histopathological findings

Gross examination revealed a small, well-circumscribed, firm tissue fragment corresponding to the excised mass. The cut surface was homogeneous and whitish, consistent with a smooth muscle tumor.

Microscopic examination showed a benign spindle-cell proliferation disposed in intersecting bundles. The spindle cells displayed uniform elongated nuclei, dispersed chromatin, and eosinophilic cytoplasm, characteristic for differentiation of the smooth muscle. No signs of necrosis, hemorrhage, nuclear atypia, or atypical mitotic activity were identified. Mitotic figures were scarce, and the margins appeared well demarcated, without infiltrative growth.

These morphological features supported the diagnosis of a benign leiomyoma of the vagina.

Conclusions

Vaginal leiomyomas are a rare clinical entity, and establishing an accurate diagnosis requires careful consideration of the differential diagnosis of vaginal masses. US serves as a rapid, accessible, and highly informative first-line imaging modality for characterizing such lesions. When further delineation is required, MRI offers superior sensitivity and specificity, providing excellent soft tissue contrast and more precise assessment of tumor origin and extent. Surgical excision remains the preferred management approach, as it allows definitive HP diagnosis, alleviates symptoms, and helps prevent potential complications associated with tumor growth.

Conflict of interests

The authors declare that they have no conflict of interests.

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