

# Vaginal leiomyoma: A case report

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**Abstract.** Vaginal leiomyomas are rare and only a small number of cases have been reported in the literature. Due to the rarity of the disease and complexity of the vaginal anatomy, definitive diagnosis and treatment are challenging. A 48-year-old female patient presented with a vaginal mass and urinary incontinence. Magnetic resonance imaging (MRI) revealed a clear tumor measuring 65x46 mm in diameter at the anterior vaginal wall. Intraoperatively, frozen-section analysis was performed to confirm that the tumor was benign. The tumor was resected using the trans-vaginal approach. The patient recovered well without any complications. The pathological diagnosis was leiomyoma. The present case suggests that intraoperative frozen-section analysis should be performed in all patients with vaginal wall tumors with MRI findings suggestive of malignancy, and surgical treatment should be performed once the diagnosis is confirmed to prevent misdiagnosis and incorrect treatment.

## Introduction

Vaginal leiomyoma is a rare benign solid tumor that typically occurs in females of reproductive age (1). It usually originates from the anterior vaginal wall and exhibits a single nodular growth pattern. The clinical manifestations depend on the size and location of the tumor and include dyspareunia, abdominal pain and dysuria. Vaginal leiomyomas may occur with leiomyomas in other parts of the body. Careful assessment is required for clinical diagnosis, as this condition may be easily

misdiagnosed (2). Care should be taken during its clinical diagnosis, as it may easily be misdiagnosed as a cystocele, urethral bulge, uterine prolapse, urethral diverticulum, vaginal cyst, vaginal cancer, cervical cancer or vaginal sarcoma (3). The diagnosis is usually confirmed through histopathological examination. The present case was reported to increase awareness of the disease and reduce the likelihood of its misdiagnosis and incorrect treatment.

## Case report

A 48-year-old female presented at the Emergency Department of a external hospital with a 2-day history of vaginal bleeding and a prolapsed hard vaginal mass, which was goose egg-sized. On examination, there was heavy vaginal bleeding with blood clots. Subsequently, the patient observed a hard mass that was the size of a goose egg in the vagina. The mass was able to be retracted when the patient was in the supine position, but it prolapsed when the patient stood or squatted. The patient also experienced urinary incontinence when coughing or sneezing. Pelvic magnetic resonance imaging (MRI) performed at another hospital indicated cervical cancer. As the exact diagnosis was unclear, the patient visited the gynecological clinic of Hexi University Affiliated Zhangye People's Hospital (Zhangye, China) in July 2021. Lower abdominal diffusion-weighted MRI performed on the first day after admission at Hexi University Affiliated Zhangye People's Hospital (Zhangye, China) revealed a soft tissue mass of ~65x46 mm at the anterior vaginal wall. The mass was isointense on T1-weighted imaging, iso-to hypointense on T2-weighted imaging and slightly hyperintense on diffusion-weighted imaging. Apparent diffusion coefficient imaging with a b-value of 800 revealed the tumor contour, and contrast-enhanced imaging revealed progressive and uneven enhancement. The solid mass was considered to be cervical cancer (Fig. 1).

A biopsy specimen of the mass was procured in the outpatient department of our hospital and pathological staining showed debris without structure. The patient was admitted to the hospital for further diagnosis and treatment. Gynecological examination revealed a 10x8 mm cystic neoplasm at the labia minora and hardening of the middle third of the anterior vaginal wall (Fig. 2A and B). A 65x46 mm solid, non-tender mass with hyperemia and superficial edema, but without obvious ulceration, was noted in the anterior vaginal wall. The

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*Abbreviations:* MRI, magnetic resonance imaging; POP-Q, Pelvic Organ Prolapse Quantification System

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mass was covered with necrotic and purulent yellow tissue. After the tumor was plugged back into the vagina, a slight increase in abdominal pressure was sufficient to prolapse it. Vulval development was normal, no abnormalities of the labia majora were detected, the cervix and uterus were normal in size, the cervical surface was smooth and there were no obvious abnormalities in the double appendage area. Pelvic organ prolapse measurement was performed. The results of Pelvic Organ Prolapse Quantification System (POP-Q) staging were as follows (4-6): Anterior vaginal wall, POP-Q III; uterus, POP-Q I; and posterior vaginal wall, POP-Q 0 (Table I).

On colposcopy, when the vulva was fully exposed, the prolapsed mass was visible inside the vagina; however, on breath holding, the mass was visible at the middle third of the anterior vaginal wall. The tumor was solid and covered by necrotic and purulent yellow tissue. There were local congestion and edema but no obvious ulceration. The acetic acid test was performed but whitening of the epithelium was not noted. No irregular vascular shadow was observed under green light or after iodine staining (Fig. 2C and D). The gynecological examination of this patient indicated that the cervix was smooth and hypertrophic, and due to the special location of the fibroids in the anterior vaginal wall, the placement of the speculum was affected and it was not possible to fully expose the fibroid. The speculum was therefore not placed and it was difficult to obtain images, and no picture data are thus available. Histopathological examination of the biopsy specimen obtained under colposcopy revealed eosinophilic granuloma. The patient initially went to the doctor with the main complaint of 'prolapse of vaginal mass for 2 days after vaginal bleeding'. At our hospital, it was confirmed that the patient's vaginal bleeding did not arise from the anterior vaginal wall tumor. Through cervical cancer and HPV testing, cervical lesions and cervical cancer were excluded as the cause of the vaginal bleeding. Therefore, a hysteroscopy was performed to further clarify the source of the vaginal bleeding. Endometrial polyps were found during hysteroscopy, which were the cause of the vaginal bleeding. The endometrium was thin and pale, and the openings of both fallopian tubes were visible. The cervical canal exhibited no irregularities. Based on these findings, the patient was diagnosed with endometrial polyps. According to the patient's symptoms and the above examination results, the patient's preoperative diagnosis was benign vaginal tumor, malignant cannot be excluded; uterine polyps; and labia minora cyst.

Hence, the patient underwent surgical resection. First, the bladder stone site was identified and disinfected. The urinary catheter was retained and the course of the urethra was explored, without disturbing the urethra and bladder. The vagina was then sterilized and the anterior vaginal wall tumor was exposed using a vaginal retractor. The upper and lower poles of the tumor root, in the anterior vaginal wall, were clamped with forceps for fixation and a transverse incision of ~6-7 cm was made along the junction of the tumor root and vaginal wall. The incision was made deep enough to reach the tumor surface capsule and the connective tissue between the tumor and vaginal wall was bluntly separated. The blood vessels of the tumor were cut off and ligated with a silk thread to arrest the bleeding completely. Excess vaginal wall tissue was trimmed and

Table I. POP staging of the patient.

Location	Preoperative			Immediately post-surgery			3 months post-surgery		
	Distance from Aa/Ap to hymen	Distance from vaginal fornix to Aa/Ap	Distance from the top of the vagina to the edge of the hymen	POP-Q score	Distance from Aa/Ap to hymen	Distance from vaginal fornix to Aa/Ap	Distance from the top of the vagina to the edge of the hymen	POP-Q score	Distance from the top of the vagina to the edge of the hymen
Anterior vaginal wall	+3Aa	+8Ba	-4C	III	+1Aa	+1Ba	-8C	II	-8C
Uterus	7.5Gh	3Pb	10TVL	I	6.5Gh	3Pb	10TVL	0	10TVL
Posterior vaginal wall	-3Ap	-3Bp	-10D	0	-3Ap	-3Bp	-10D	0	-10D

Points of reference: Aa, midline of anterior vaginal wall; Ap, midline of posterior vaginal wall 3 cm proximal to hymen. POP-Q, Pelvic Organ Prolapse Quantification System.

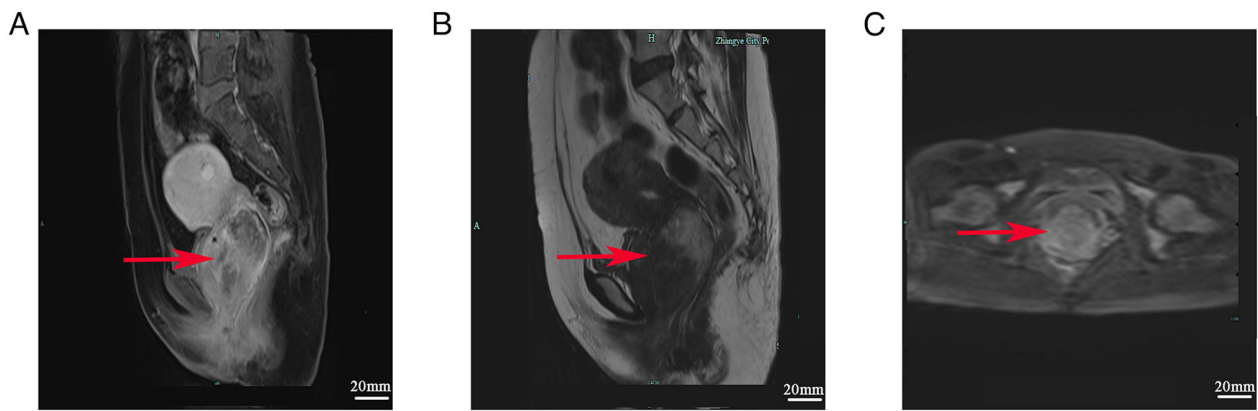


Figure 1. Preoperative magnetic resonance images. A soft tissue mass of ~65-46 mm on the vaginal wall visualized (red arrows) using (A) T1-weighted imaging in the sagittal plane. (B) T2-weighted imaging in the sagittal plane. (C) Cross-sectional diffusion-weighted imaging.

the intraluminal space between the ends was closed by suturing with 2-0 absorbable thread; 1-0 absorbable thread was used for suturing continuously and longitudinally along the vaginal wall and no bleeding was noted on the wound surface. A gauze roll was placed in the closed vagina to provide compression for avoiding bleeding; it was removed 24 h after surgery. Frozen-section analysis revealed that the lesion was benign. Therefore, simple mass resection was performed. Postoperative immunohistochemical analysis (4) indicated that the samples were positive for desmin and smooth muscle actin, and negative for CD34 (cat. no. Kit-0004), S100 (cat. no. Kit-0007) and STAT6 (cat. no. RMA-0845; all ready-to-use without dilution; all from Fuzhou Maixin Biotechnology Development Co., Ltd). Based on the histomorphology that was performed according to standard protocols and immunohistochemistry results, the patient was pathologically diagnosed with vaginal leiomyoma (Fig. 3). Following this, the pelvic organ prolapse was measured again. The results of the postoperative POP-Q staging were as follows (5-7): Anterior vaginal wall, POP-Q II; uterus, POP-Q 0; and posterior vaginal wall, POP-Q 0. The patient recovered well after surgery: At 6 h postoperatively, the patient was able to eat normally; at 1 day postoperatively, the patient passed flatus and stool, and 3 days postoperatively, the urinary catheter could be removed, as the incontinence resolved; the patient had no increased urinary frequency or urgency, and no urine leakage while coughing or sneezing. At seven days postoperatively, the patient was discharged, as she was recovering well. The patient experienced menstrual cramps 28 days postoperatively but had no discomfort 3 months postoperatively. The results of the gynecological examination, pelvic organ prolapse measurement and POP-Q staging were normal: Anterior vaginal wall, POP-Q II; uterus, POP-Q 0; and posterior vaginal wall; POP-Q 0 (Table I). The patient is currently being followed-up and is recovering well.

## Discussion

Vaginal leiomyoma is a rare benign tumor that frequently occurs in females aged between 35 and 50 years. Its clinical manifestations are insidious, and it is often found during

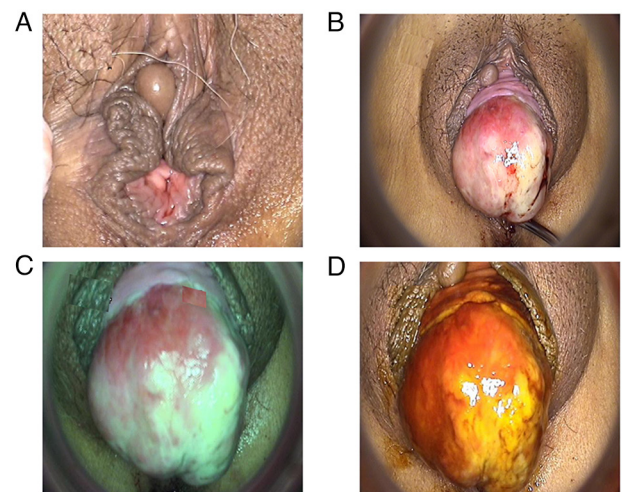


Figure 2. Colposcopy images. (A) Image of the vulva bearing the vaginal mass (A 10x8 mm cystic neoplasm at the labia minora). (B) Prolapse of the vaginal mass occurred during breath holding (A 65x46 mm solid, non-tender mass). (C) Observation under green light. (D) Observation under iodine staining.

gynecological examination. It mostly occurs at the anterior vaginal wall and grows as a single nodule (8,9). It has a cystic, cystic-solid or solid texture, which is related to its degeneration. Preoperative assisted ultrasonography, MRI, computed tomography, urethral angiography, cystoscopy and proctoscopy may help to determine the degree of displacement of the bladder, urethra and rectum, which aids in the differential diagnosis and guides surgical treatment planning (10,11).

The patient of the present study had a leiomyoma at the anterior vaginal wall, which is the most common site of vaginal leiomyoma, but the clinical features of this patient have rarely been reported in previous cases. The present case is unique in terms of the growth pattern, location and size of the tumor. Prolapse of the tumor from the vagina may cause symptoms of pelvic floor dysfunction and stress urinary incontinence. In this patient, vaginal bleeding and vaginal masses were obviously considered to be cervical cancer according to clinical symptoms and MRI suggested cervical cancer. These tumors may easily be misdiagnosed as cervical cancer. In addition, the patient's condition was complicated



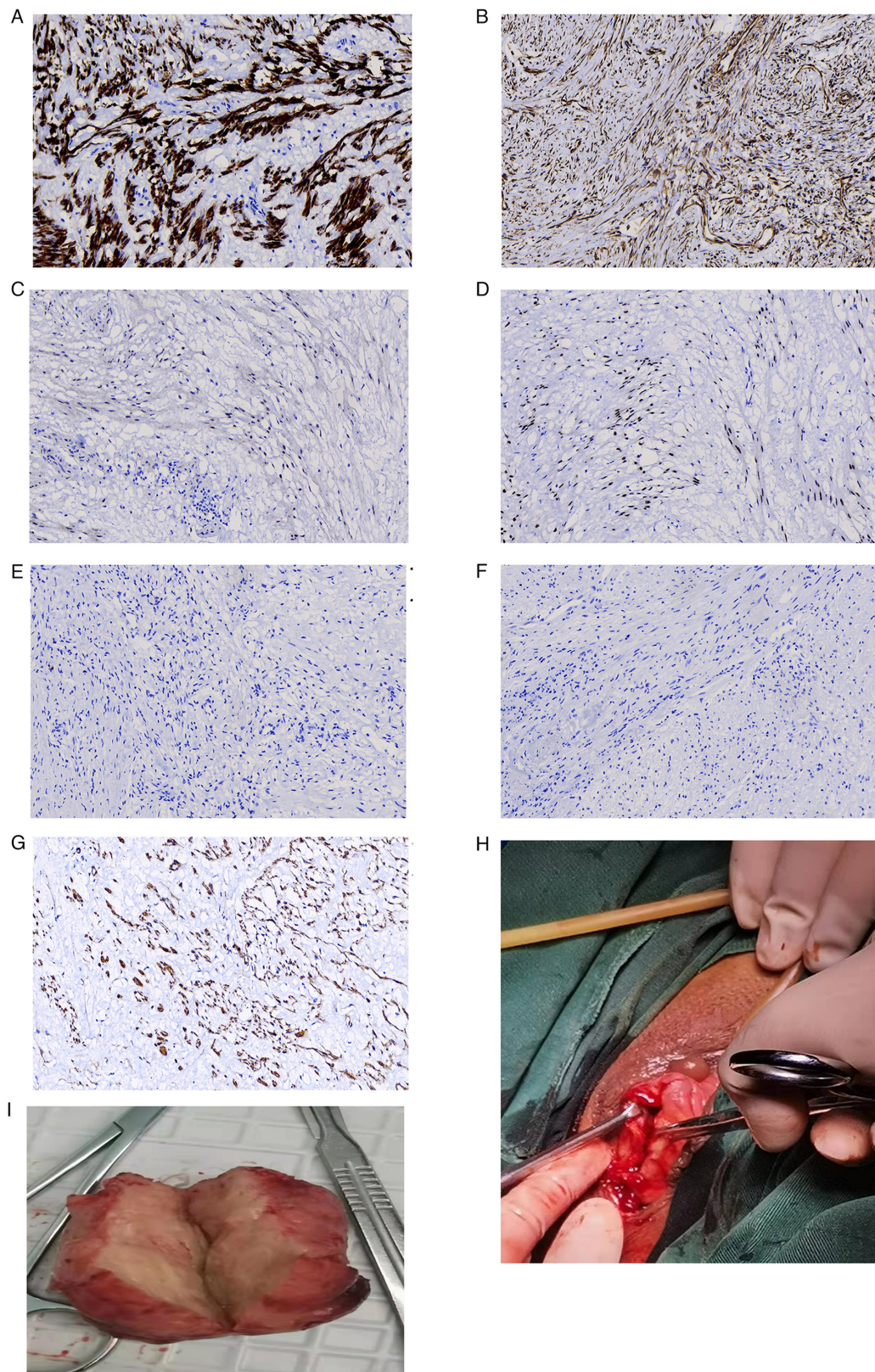


Figure 3. Immunohistochemical and postoperative images. The mass was (A) desmin-positive, (B) vimentin-positive, (C) estrogen-receptor-positive, (D) progesterone receptor-positive, (E) S-100-negative, (F) STAT6-negative and (G) smooth muscle actin-positive (original magnification, x200). (H) Vaginal morphology after tumor removal. (I) Image of tumor specimen.

by pelvic floor dysfunction and stress urinary incontinence, and the combination of multiple diseases made the patient more likely to be misdiagnosed. The report of the diagnosis and treatment of this patient therefore has important clinical

value. Furthermore, the patient's routine blood and biochemical examination results indicated no anomalies and at present, there are no good hematological markers to judge the nature of the tumor. However, in the clinic, markers for leiomyoma are required.

After a multidisciplinary discussion at our hospital, the following conclusions were reached: i) If the tumor surface envelope exceeds 4 mm, it is difficult to perform histological diagnosis. Therefore, multi-needle biopsy and frozen-section analysis should be performed to rule out malignancy. ii) No obvious symptoms of stress urinary incontinence before tumor prolapse and frequent stress urinary incontinence after tumor prolapse indicates that there is a vaginal tumor. The orientation of the structures that support the urethra and bladder may change due to the effect of gravity. Pelvic floor dysfunction and symptoms of stress urinary incontinence may disappear after tumor removal. Therefore, tumor resection should be performed first, followed by observation. There is no need to temporarily treat the urinary incontinence. iii) Vaginal tumors should be considered during the preoperative MRI evaluation of pelvic floor dysfunction and dynamic MRI should be used to evaluate pelvic floor function, if necessary. iv) Pelvic prolapse may be evaluated intraoperatively. Gynecological examination, pelvic organ prolapse measurement and POP-Q staging should be repeated after solid vaginal tumor resection and the subsequent treatment should be determined based on the results (12,13).

Pathological examination of the present case after tumor resection revealed vaginal leiomyoma. Vaginal leiomyoma has a high misdiagnosis rate, both locally in China and globally, and diagnosis based on imaging findings alone is difficult. Misdiagnosis occurs most frequently in patients with a 'prolapsed vaginal mass'. These patients present with a prolapsed vaginal mass, abdominal pain and discomfort, and discomfort during defecation and urination (14). Most frequently, the initial diagnosis is 'uterine prolapse' and the patient then receives delayed or incorrect treatment. Furthermore, pelvic floor diseases were frequently overlooked in the past and numerous cases may have gone undetected due to missed diagnosis and misdiagnosis (15,16). The use of inappropriate methods of specimen collection for pathological examination may delay diagnosis and treatment and make it impossible to confirm the diagnosis prior to surgery, particularly in patients with associated pelvic floor dysfunction and stress urinary incontinence. There is a lack of large studies on the treatment of such patients and this area requires to be further explored.

In conclusion, although vaginal leiomyoma is easy to misdiagnose, it is associated with a favorable prognosis. The present case suggests that intraoperative frozen-section analysis should be performed in all patients with vaginal wall tumors with MRI findings suggestive of malignancy, and once diagnosis is confirmed, surgical treatment should be performed to prevent misdiagnosis and incorrect treatment.

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## Availability of data and materials

All data generated or analysed in this study are included in this published article.

## Authors' contributions

YG and YQ made substantial contributions to the conception and design of the work and drafted and revised the manuscript. JL and JQ collected clinical information, designed the study and assisted with the drafting of the manuscript. JY and JQ made substantial contributions to the design of the study, drafted the manuscript and confirmed the authenticity of all raw data. All authors have read and approved the final manuscript.

## Ethics approval and consent to participate

The study was conducted according to the guidelines of the Declaration of Helsinki and approved by the Ethics Committee of Hexi University Affiliated Zhangye People's Hospital (Zhangye, China). Written informed consent was obtained from the patient.

## Patient consent for publication

Written informed consent was obtained from the patient for publication of the data and images in this case report.

## Competing interests

The authors declare that they have no competing interests.

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