# A Case Report: Immunohistochemical Staining Reveals Benign Classification of a Smooth Muscle Tumor with Uncertain Malignant Potential

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**Abstract:** Smooth muscle tumors of uncertain malignant potential (STUMP) are rare tumors that cannot be definitively classified as benign or malignant. In this clinical case, we present the case of a 50-year-old woman who consulted for hypogastric pain, urinary urgency, and abdominal distension. Transvaginal ultrasonography revealed an enlarged and irregularly shaped uterus with an intramural fibroid measuring 8.6 cm in diameter. The patient underwent a total abdominal hysterectomy, and pathologic examination revealed a uterine smooth muscle tumor of uncertain malignant potential with hypercellular spindle-shaped excess, cytologic atypia, and four mitoses in 10 high-power fields without cell necrosis. The immunohistochemical study ruled out malignancy of the smooth muscle tumor of uncertain potential. The patient is currently asymptomatic and undergoes check-ups every six months.

**Keywords:** Tumor, Smooth muscle, Uncertain malignant potential, Pathology, Case report

## Introduction

Mesenchymal smooth muscle tumors of uncertain malignant potential (STUMP) [1] are a category of uterine tumors characterized by uncertain histopathologic features and uncertain malignant potential [2], [3]. These tumors are less common than benign uterine leiomyomas but more common than malignant leiomyosarcomas. The World Health Organization (WHO) has classified them as having malignant potential. WHO classified these tumors as intermediate in grade between benign leiomyomas and leiomyosarcomas [4], [5].

PMTS account for approximately 1% to 2% of all uterine tumors [6]. Although they are considered tumors of uncertain malignant potential, many cases of PMTS have a benign clinical behavior, with a low recurrence rate after surgical resection.

Immunohistochemical staining has been used to aid in the diagnosis of STUMP and to predict its malignant potential. Some studies have suggested that the expression of specific proteins, such as p53, p16INK4a, and Ki-67, may help distinguish benign from malignant STUMPs [7]. The PMTS prognosis depends on several factors, including the size, location of the tumor, and the patient's age and general health. The 5-year survival rate of patients with PMTS varies from 87% to 100%, depending on the studies and methodology used [8] . This case report is structured as follows: Section 2 presents the case and its objective, Section 3 presents the discussion, histopathologic features, and treatment management, and Section 4 presents the conclusions.

## 1. Case Presentation

A 50-year-old woman consulted a gynecologist because, for approximately two months, she had presented oppressive pain in the hypogastrium radiating to the pelvis and lower back, accompanied by urinary urgency and abdominal distension. She has no medical history of interest. Gynecological-obstetric history: menarche at 13 years of age with irregular cycles and two cesarean sections without complications. The first delivery was at 29; from the second delivery, at 33, she presented menstruation with abundant bleeding for five days.

The transvaginal ultrasound results show the uterus in anteverted flexure with heterogeneous myometrium. It is irregular in shape with enlargement, deformed by a sizeable intramural myoma on the anterior aspect of the fundus measuring 8.6 cm in diameter, with a myoma volume greater than 208 cc. The uterus measures 92x72x74 mm and has a volume of 287 cc. The regular endometrium measures 5.5 mm. The uterus increased by about 16 cm is irregular and painful, mobile with a stiff consistency.

The patient underwent a total abdominal hysterectomy and bilateral salpingectomy. The ovaries were allowed to produce enough hormones to aid the menopausal process.

The anatomopathological study shows the macroscopic examination that the uterus and the extracted tubes weigh 314.4 grams, the dimensions of the body and fundus are 80 x 75 x 60 mm, and the neck is 35 x 25 mm. The right tube measures 40 mm in length by 5 mm in diameter; the left measures 75 mm by 5 mm in diameter (Figure 1). The ectocervical mucosa is smooth and pink; the endocervical canal is patent; the endometrial cavity is symmetrical and triangular, 35 x 14 mm. The mucosa thickness is 2 mm, and there are no lesions. The myometrium is 17 mm thick and presents a poorly defined 90 mm, multinodular, whorled, fasciculated, whitish, elastic nodule with striae, extramural and subserosal. In addition, there is a poorly defined whitish nodule with reddish dots of 25 mm in diameter in the background. The right uterine tube shows two cystic formations in its distal third of 5 mm each. The left uterine tube did not present relevant lesions.

The histopathological diagnosis was chronic cervicitis accompanied by retention cysts and endocervical glands with moderate lymphoplasmacytic inflammatory infiltrate and weakly proliferative endometrium. The myometrium was compatible with a smooth muscle tumor of uncertain malignant potential [5], [6], [7], consisting of hypercellular fusiform proliferation (Figure 2), with cytological atypia (Figure 3), four mitoses in 10 CGA and no cell necrosis. In addition, adenomyosis comprised islets of glands, and endometrial stroma of deep myometrial location was evidenced. The uterine tubes were found within normal limits and showed a right paratubal cyst of the paramesonephric type.

A complimentary immunohistochemical study assessed the overexpression of p16, p53, Ki67, and MIB-1, using the avidin-biotin-peroxidase technique (ABC) with a 4738-C2-21 paraffin block.

The specimen is a uterine nodule, histopathologically identified as a smooth muscle tumor of uncertain malignant potential. After deparaffinization, histological sections were incubated with the monoclonal antibody p16INK4a, and cell proliferation index Ki67 and p53-appropriate positive controls were used to establish the accuracy of the reactions. p16ink4a is a suppressor gene that modulates cell proliferation. It was observed that Ki-67 overexpression is less than 1% in spindle cells, and p53 overexpression is 0% in spindle cells, while p16ink4a presented

focal nuclear-cytoplasmic positivity (++/+++) into clusters of spindle cells, thereby ruling out malignancy of smooth muscle tumor of uncertain malignant potential. Table 1 presents the proteins used with the ranges of expression, which may vary depending on the study and the type of cancer, and clinical significance.

| Protein | Expression range | Clinical significance |
|---|---|---|
| p53 | 0-10% | Absence of significant cellular damage. |
| p53 | >10-50% | Moderate to significant cellular damage. |
| p53 | >50% | Significant cellular damage. |
| p16INK4a | Focal | Normal or slow cell growth. |
| p16INK4a | Diffuse | Abnormal or rapid cell growth. |
| Ki-67 | <1% | Normal or slow cell growth. |
| Ki-67 | 1-10% | Intermediate or abnormal cell growth. |
| Ki-67 | >10% | Abnormal or rapid cell growth, possible malignancy. |

**Table 1.** Proteins used and ranges.

Post-surgical control imaging studies at two months, using computed tomography of the chest, abdomen, and pelvis, showed no lesions suggestive of malignancy; the patient is currently asymptomatic.

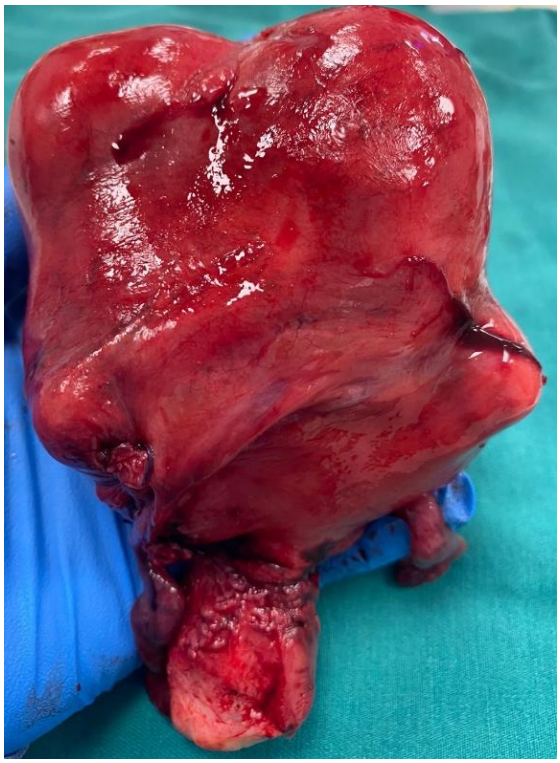

*Figure 1. Macroscopic aspect of the uterus and tubes.*

The cervix presents chronic cervicitis in the histopathological diagnosis, accompanied by retention cysts and endocervical glands by a moderate lymphoplasmacytic inflammatory permeate. The endometrium is weakly proliferative; in the myometrium, a smooth-out muscle tumor of uncertain wicked potential [7], [8], [9] was detected, consisting of hypercellular (Figure 2), spindle-shaped proliferation with cytologic atypia (Figure 3), four mitoses in 10 CGA, without cell necrosis. In addition, histopathology found adenomyosis, consisting of islets of glands and endometrial stroma of deep myometrial location. The tubes are within normal limits; there is a right paratubal cyst of the paramesonephric type.

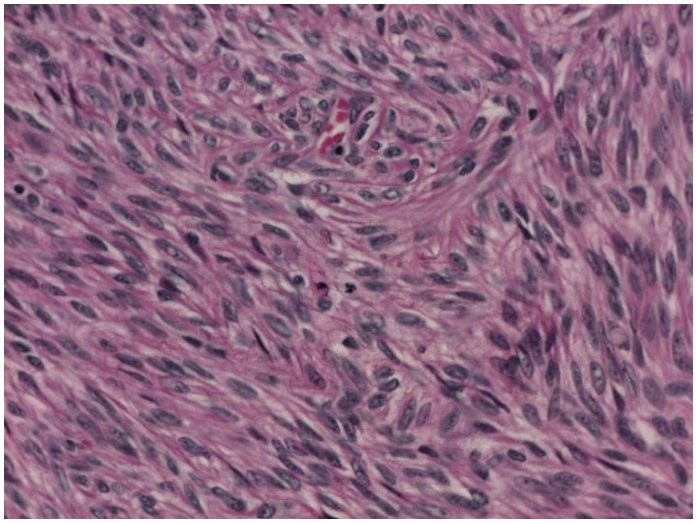

*Figure 2. Microscopy of the specimen. A: Spindle-shaped hypercellular proliferation with cytologic atypia and scant cytoplasm.*

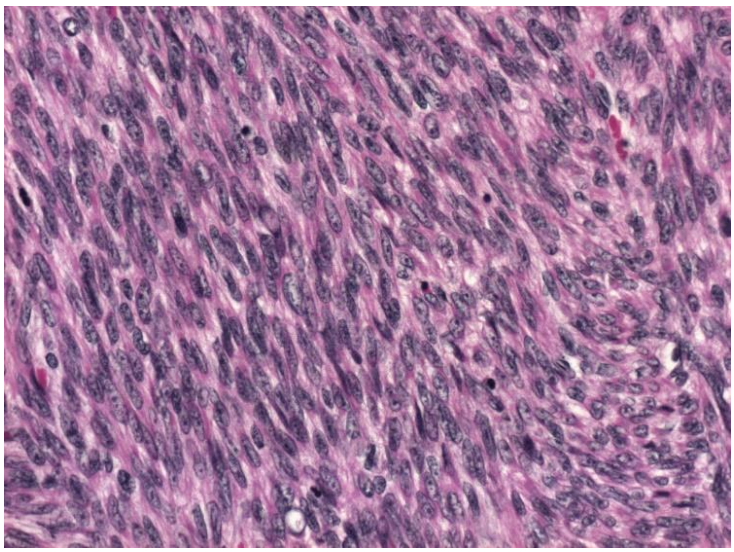

*Figure 3. Microscopy of the specimen. B: Central mitosis is also evident in A, HE-40X.*

**3. Discussion**

The pathological study reports a uterine smooth muscle tumor of uncertain malignant potential (STUMP) in the present case. The present case report raises several concerns related to STUMP [10]. As a ruling, the first concern relates to STUMP presenting an asymptomatic test for equally clinicians and pathologists. In the medical procedure, the patient role with STUMP shows signs and symptoms like those of poliomyelitis symptoms as those of benign uterine leiomyomas, leiomyosarcomas and pelvic pain, pressure, uterine bleeding, abnormal uterine bleeding, or a pelvic mass.

The images of STUMPs are interchangeable with benign leiomyomas and leiomyosarcomas and are typically diagnosed after hysterectomy by applying histopathologic analysis of the specimen by analyzing atypia, mitotic index, and type of necrosis. STUMP is detected if the tumor has an uncommon combination of these three features but does not meet the criteria for leiomyosarcoma.

The second concern concerns these tumors' inadequate knowledge and erratic behavior after the pathologically categorizing STUMP as borderline. There is some controversy regarding the classification of STUMP and the features that generally precisely reflect these tumors' true recurrent or metastatic potential. Overall, suppose STUMP is diagnosed parenthetically on a hysterectomy sampling. In that case, the patient should be treated according to the

leiomyosarcoma protocol, consisting of an initial evaluation and regular complement every six months for the first years and then annual observation for the following years. Development appointments should involve history, regular pelvic assessment, and yearly tomography studies, including chest X-ray photographs, pelvic echography, and ultrasound CT or MRI scans to detect recurrences.

Uterine smooths out mesenchymal muscle tumors are persistent tumors in the female genital tract. Within these tumors, we find those histologically defined as benign, malignant, and uterine smooth muscle mesenchymal tumors of uncertain significance, implying those that cannot be classified in any of the two previous groups.

The diagnosis of this type of tumor is anatomopathological. It is based on the mitotic count due to the existence of atypia, focal or diffuse, mild, moderate, or intense, and the existence or absence of areas of coagulative necrosis and on the cellular morphology of spindle-shaped or epithelioid of the tumor.

The mitotic count [11] is defined as the number of frailty markers (FM) per 10 CGA; atypia can be "significant," moderate to severe atypia, and "non-significant," absent or mild. The presence of areas of coagulative necrosis is familiar in malignant tumors and is an essential predictor of the biological behavior of aggressive biological behavior.

A rapid evolution between viable cells and a region of the necrosis typifies it.

Thus, we can define leiomyomas as those macroscopically solid tumors, with elastic consistency, of net limits that microscopically show counts of less than 5 FM/10 CGA and lack coagulative necrosis and atypia, and leiomyosarcomas as tumors with two or more of the following characteristics: MR > 10 mitoses/CGA, presence of coagulative necrosis and diffuse cytologic atypia.

**4. Conclusions**

The patient had a smooth muscle tumor of uncertain malignant potential (STUMP), a rare, intermediate-grade tumor found in postmenopausal women. The tumor was discovered by transvaginal ultrasound, which revealed a heterogeneous myometrium with an intramural myoma on the anterior aspect of the uterine fundus, measuring 8.6 cm in diameter. The patient

underwent a total abdominal hysterectomy and bilateral salpingectomy. Chronic cervicitis, retention cysts, and adenomyosis accompanied the histopathologic diagnosis of a smooth muscle tumor of uncertain malignant potential. Postoperative control imaging studies at two months by computed tomography showed no lesions suggestive of malignancy, and the patient is currently asymptomatic. The case highlights the importance of thorough examination and immunohistochemical studies in diagnosing and staging smooth muscle tumors, particularly STUMP. A multidisciplinary approach involving expert pathologists, radiologists, and gynecologists is essential in managing and treating these cases.

The immunohistochemical study ruled out malignancy of the smooth muscle tumor of uncertain potential.

**Contributors**

Patricia Acosta-Vargas, Belén Salvador-Acosta, and Gloria Acosta-Vargas performed the literature search, case study, and analysis and contributed to writing the article.

Domínguez participated in the examination and treatment of the patient and the article's writing and obtained the patient's informed consent to publish the case report. Evaluated the transvaginal images and joined in the article's writing.

Gloria Acosta-Vargas shared the histopathologic evaluation of the surgical case and collaborated in writing the article.

**Conflict of interest**

The authors declare that they have no conflict of interest concerning the publication of this case report.

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**Patient consent**

Fully informed consent was obtained from the patient to publish this case report and accompanying images.

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