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Uterine Morcellation and the Risk of Smooth Muscle Tumors of Uncertain Malignant Potential: A Case Report Highlighting Preoperative Diagnostic Challenges

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Abstract:

Uterine morcellation is a commonly used surgical technique for extracting leiomyomas, enabling a minimally invasive approach. However, this technique carries a risk of disseminating malignant tumors or those with uncertain malignant potential, particularly leiomyosarcomas and smooth muscle tumors of uncertain malignant potential (STUMPs). We present a clinical case of a 40-year-old woman who underwent laparoscopic hysterectomy with morcellation for presumed leiomyomas, in whom an 8-cm STUMP was discovered incidentally at histopathology. This case highlights the preoperative diagnostic challenges of STUMPs and leiomyosarcomas, which cannot be reliably ruled out before surgery. The dissemination of tumor tissue during morcellation, although rare, can lead to significant complications, including local and distant recurrence. The management of patients diagnosed with a STUMP after morcellation remains controversial and requires an individualized approach. Further research is needed to improve preoperative diagnostic tools and optimize management strategies for STUMPs and leiomyosarcomas.

Keywords:

Uterine morcellation, STUMP, leiomyosarcoma, preoperative diagnosis, tumor dissemination.

Introduction:

Uterine morcellation, a surgical technique for the extraction of leiomyomas (LM), is associated with a known risk of disseminating occult leiomyosarcomas (LMS) [1, 2]. However, STUMPs, a type of smooth muscle tumor with uncertain malignant potential, often receive limited attention. STUMPs present a preoperative diagnostic challenge due to their unpredictability. The present study aims to illustrate a clinical case of incidental STUMP discovery after uterine morcellation, highlighting the challenges and clinical implications.

Case Report:

A 40-year-old woman, presented with chronic pelvic pain characterized by a feeling of heaviness. Pelvic CT scan revealed a right lateral uterine tissue mass. Coelioscopic exploration identified a mass in the right broad ligament intimately associated with the uterus, suggesting a uterine leiomyoma. The patient underwent hysterectomy with mass morcellation. Postoperative histopathological analysis revealed a uterine smooth muscle tumor of uncertain malignant potential (STUMP), specifically an epithelioid subtype with moderate mitotic activity and focal necrosis. The patient was followed closely with regular physical examinations and imaging studies.

Discussion:

Uterine smooth muscle tumors represent a heterogeneous group. According to the World Health Organization's definition, any uterine smooth muscle tumor exhibiting characteristics indicative of malignancy and not meeting the criteria for LMS or LM can be diagnosed as STUMP [3]. Clinically, patients with uterine STUMP present with nonspecific symptoms such as pelvic pain, discomfort, or heaviness, and abnormal gynecological bleeding [4].

The presented clinical case eloquently illustrates the complex challenges associated with the management of uterine leiomyomas and underscores the implications of morcellation, especially when it incidentally reveals a STUMP (Smooth Muscle Tumor of Uncertain Malignant Potential). One of the central points of this discussion lies in the inherent difficulty in establishing a reliable preoperative diagnosis. Despite the diagnostic tools at our disposal, including magnetic resonance imaging (MRI), the certainty of excluding malignancy, whether a leiomyosarcoma or a STUMP, remains elusive [5]. Imaging features, such as tumor size, rapid growth, structural heterogeneity, or the presence of necrotic areas, while suggestive,

lack the specificity to allow for a definitive distinction. Similarly, endometrial biopsies, although essential for excluding concomitant endometrial carcinoma, provide no information on the nature of submucosal or intramural leiomyomas, thus leaving a considerable diagnostic gray area.

Given these uncertainties, morcellation, while offering the advantages of a minimally invasive approach, carries a risk of tumor tissue dissemination in the peritoneal cavity [6]. In the specific context of STUMPs, this dissemination raises particular concerns. Indeed, although these tumors are not considered malignant in the strict sense, their unpredictable biological behavior warrants a cautious approach. The potential consequences of STUMP cell dissemination include a risk of local recurrence, which may present as peritoneal implants requiring repeated surgical interventions. In addition, even though this remains a rare event, the possibility of malignant transformation of these disseminated cells cannot be completely excluded. Finally, the presence of disseminated STUMP tissue can significantly complicate differential diagnosis when new symptoms or pelvic masses appear, potentially mimicking other conditions or obscuring the development of a new lesion.

The management of patients in whom a STUMP is incidentally discovered after morcellation remains a source of debate [7]. The lack of a clear consensus highlights the need for an individualized approach, based on shared decision-making with the patient [8]. Management strategies may include careful monitoring, repeat surgery to remove any residual or disseminated tissue, and discussions on the potential benefits of using tissue containment systems during morcellation to reduce the risk of dissemination [9, 10]. While this last option may seem promising, it should be noted that these systems are not without limitations, and cases of bag rupture or leakage have been reported [11, 12].

Conclusion:

This clinical case strongly emphasizes the importance of a rigorous preoperative assessment of uterine leiomyomas, complete and transparent information to the patient on the risks and benefits of morcellation, and shared decision-making that takes into account the patient's preferences and available scientific data. Clinicians must be aware of the possibility of occult STUMPs and be prepared to consider individualized risk management strategies to minimize the potential consequences of STUMP cell dissemination. Continued research to improve the preoperative characterization of uterine smooth muscle tumors and to assess the long-term

impact of morcellation on the prognosis of STUMPs is essential to inform clinical practice and improve patient care.

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