Original Article

“Iatrogenic” Parasitic Myomas: Unusual Late Complication of Laparoscopic Morcellation Procedures

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ABSTRACT

Study Objective: To describe our experience in diagnosing and managing parasitic myomas developing as an unexpected late complication of laparoscopic morcellation.

Design: Observational study (Canadian Task Force classification II-3).

Setting: University hospital.

Patients: Retrospective chart review of all patients found to have parasitic myomas that developed after previous morcellation.

Intervention: Laparoscopic morcellation. Review of the recent literature correlated with clinical, surgical, and pathologic features of our cases.

Measurements and Main Results: Four patients had heterogeneous pelvic masses after morcellation. In 3 patients, symptoms developed between 2 and 16 years after the primary surgery. One patient had no symptoms, and was referred because of a suspect pelvic mass. Vaginal examination revealed painful pelvic masses in the pouch of Douglas in 2 patients, and painless masses fixed to the vaginal vault and anterior vaginal wall, respectively, in the other 2 patients. Laparoscopic examination confirmed the presence of parasitic masses in 3 patients. In 1 patient, the mass was excised vaginally. Histologic analysis confirmed leiomyoma fragments in all patients. A well-differentiated endometrial carcinoma was incidentally found in 1 patient after hysterectomy.

Conclusion: These masses probably resulted from growth of missed fragments of uterine tissue after previous morcellation, culminating in development of symptomatic iatrogenic parasitic myomas. If morcellation is anticipated or required, exclusion of malignancy is mandatory. Meticulous inspection of the abdominal cavity is necessary after morcellation. In patients with a history of morcellation who have pelvic masses, iatrogenic parasitic myomas should be considered in the differential diagnosis. Journal of Minimally Invasive Gynecology (2010) 17, 719–724 © 2010 AAGL. All rights reserved.

Keywords: Laparoscopic morcellation; Retained fragments; Parasitic myoma; Pelvic mass

Benign diseases of the uterus account for a large percentage of surgical procedures in gynecologic practice. Technologic advances in laparoscopic techniques and instrumentation have enabled physicians to avert laparotomy in many cases, resulting in realistic benefits over conventional surgery [1]. Since the 1990s, the laparoscopic approach has gained popularity [2–7], and currently, total hysterectomy [8], subtotal hysterectomy [9], and myomectomy [10] are frequently performed by laparoscopy in many centers around the world.

One of the advances in technology has been the development of laparoscopic morcellators [11–13]. Morcellation is widely used to remove large uteri or myomas through small abdominal incisions at laparoscopic surgery [14–16]. Despite 2 decades of experience coupled with widespread acceptance of morcellation, reports of procedure-related complications are few, and most complications are related to intraoperative visceral or vascular injury [17]. Nevertheless, some long-term complications after morcellation of the uterus have recently been described in the literature [18–27].

The objective of the present study was to report our single-institution experience and present a review of the current literature on diagnosis and management of patients who reported pelvic complications, probably due to missed...
fragments of uterine tissue after previous morcellation, resulting in true “iatrogenic” parasitic myomas.

Materials and Methods

This was a retrospective observational study of all patients who underwent laparoscopic surgery with morcellation because of benign uterine disease and who developed pelvic complications or heterogeneous pelvic masses several months or years after the primary surgery. In addition, a review of the recent literature on iatrogenic parasitic myomas is included. Only reports of parasitic myomas detected after previous laparoscopic morcellation were selected for further analysis. Available data about clinical symptoms, previous surgeries, and surgical findings were tabulated and correlated with both clinical and pathologic features for each case.

Case Reports

Case 1

A 57-year-old menopausal woman, gravida 1, para 1, who was receiving hormone therapy and had a history of cervical intraepithelial neoplasia grade 1 treated with laser surgery, had persistent spotting. She had undergone laparoscopic myomectomy 16 years previously, and 2 hysteroscopic resections of submucous myomas 5 and 7 years previously, respectively. However, the resections were not complete because of intramural location of the myomas. During routine examination, vaginal touch revealed a slightly shortened right vaginal fornix without other symptoms. Transvaginal ultrasonography revealed a 35-mm intramural myoma and a 3-cm cystic lesion in the right ovary. The endometrial cavity could not be satisfactorily evaluated. A Papanicolaou smear was normal. Spotting was initially attributed to hormone therapy and the presence of myomas. Repeated transvaginal ultrasound demonstrated persistence of the ovarian cyst. Because of the patient’s history, postmenopausal bleeding, and a persistent adnexal mass, more radical treatment including exploratory laparoscopy with total hysterecomy plus bilateral salpingo-oophorectomy, and frozen-section analysis was proposed and accepted. Unexpectedly, laparoscopy revealed a pedunculated oval myoma-like mass in the pouch of Douglas. The mass was mobile and attached to the peritoneum with a thin vascular stalk approximately 3 to 4 mm thick (Fig. 1). Frozen-section analysis revealed a calcified leiomyoma, and an intraoperative diagnosis of a myoma fragment left behind during previous laparoscopy was made. A frozen section of the uterus was normal. Total laparoscopic hysterectomy plus bilateral salpingo-oophorectomy was successfully performed, with resection of the pedunculated lesion. All specimens were removed intact through the vagina. There were no postoperative complications, and the patient was discharged on postoperative day 3. Definitive histopathologic analysis revealed adenomyosis and leiomyomas in the uterus, with a focus of well-differentiated endometrial carcinoma without myometrial invasion in the right uterine horn. The pedunculated mass was described as a necrosed and partially calcified mummified leiomyoma without signs of malignancy. A diagnosis of stage IaG1 endometrial carcinoma was made, and no further treatment was required.

Case 2

A 44-year-old woman, gravida 2, para 2, came to our hospital with severe pelvic pain. The medical history was relevant in that she had undergone a laparoscopic myomectomy because of pelvic pain and menorrhagia 8 years previously. The surgery was uncomplicated, and a 600-g myoma was removed through a culdotomy incision after mechanical morcellation. No complications occurred during surgery or during the postoperative period, and follow-up was unremarkable. Vaginal examination revealed a painful retrocervical mass. Ultrasonography revealed a 7-cm heterogeneous mass in the pouch of Douglas. Operative laparoscopy was performed, which revealed a 7-cm myomalike pedunculated lesion attached to the right infundibulopelvic ligament by a vascular pedicle 4 mm thick. The uterus and adnexae were normal. The mass was dissected using bipolar forceps, and extracted after careful morcellation. Histopathologic analysis confirmed leiomyoma without atypia. The patient had an uneventful hospital stay, and was discharged on postoperative day 2 without any complications.

Case 3

A 39-year-old nulliparous woman was referred to our department because of pelvic pain and the finding of a pelvic tumor during routine examination. The patient had undergone total laparoscopic hysterectomy with mechanical morcellation because of symptomatic myomas 6 years previously. Vaginal examination revealed a pelvic mass attached to the vaginal cuff. Transvaginal ultrasonography demonstrated a 6 × 3-cm mixed pelvic mass fixed to the vaginal vault. Pelvic magnetic resonance imaging (MRI) confirmed a suspected mass that probably originated from the right ovary (Fig. 2). Carcinoembryonic antigen and CA125 concentrations were normal. The CA 199 concentration was 49 IU/L (normal, <35 IU/L). A malignant tumor was suspected, and diagnostic laparoscopy was performed, which revealed a 6-cm solid cystic lesion intimately attached to the presacral peritoneum (Fig. 3A). The ovaries were normal. After meticulous dissection, complete resection was accomplished. During dissection of the mass, liquid content resembling old blood (e.g., endometriotic lesions) was identified (Fig. 3B). Frozen-section analysis confirmed a benign lesion with presence of endometrial glands; however, the exact origin of the mass could not be determined. Definitive histologic analysis confirmed the presence of smooth muscle infiltrated by endometrial glands (adenomyosis), and a uterine fragment without signs of malignancy. The postoperative course was
unremarkable, and the patient was discharged within 3 days. Postoperative controls were normal.

Case 4

A 56-year-old woman, morbidly obese (body mass index, 53), was referred to our department with a diagnosis of anterior genital prolapse (cystocele). She reported a genital bulge and the presence of a mass protruding from the vagina (Fig. 4A). The patient had undergone total laparoscopic hysterectomy because of symptomatic myomas, with laparoscopic morcellation of the uterus, 3 years previously. Gynecologic examination revealed a 3 × 5-cm solid round mass in the anterior vaginal wall (Fig. 4A). The mass was mobile, painless, and intimately related to the vaginal cuff scar. There was no evidence of cystocele or other pelvic organ prolapse. Based on our experience, the patient’s body habitus, and history of laparoscopic hysterectomy with morcellation, an iatrogenic parasitic myoma was suspected, and surgical excision was planned. The mass was excised via the vaginal route without complications (Fig. 4B). Frozen-section analysis revealed a leiomyoma. Definitive histologic analysis confirmed the leiomyoma, without atypia. The patient had an uneventful hospital stay, and follow-up was unremarkable.

Discussion

Parasitic myomas are defined as benign smooth-muscle masses separated from the uterus. The cause, natural history, and pathologic basis of parasitic myomas are not clearly understood; however, they probably originate as a pedunculated subserosal myoma that twists and torses from its uterine pedicle. Now “free” in the peritoneal cavity, they survive via neovascularization from adjacent structures [27,28].

As advanced gynecologic laparoscopic procedures increase, identification of potential long-term sequelae that were not encountered after classic laparotomy becomes ever more important. Even if morcellation enables removal of large specimens at laparoscopy, there is risk of incomplete removal. A few recent case reports [18–22] and small series [23,27] have associated the late finding of parasitic myomas with previous laparoscopic morcellation procedures, which suggests a new developmental mechanism for parasitic myoma (Table 1). These iatrogenic parasitic myomas [28,29] probably originate from fragments of uterine tissue being left in the peritoneal cavity after morcellation. Later,
these missed fragments become implanted in normal tissue anywhere in the abdominal cavity and are able to grow via neovascularization from the peritoneum.

The true incidence of retained uterine fragments is unknown and is difficult to estimate because small fragments might not cause symptoms and would not be identified unless a separate problem warranted surgical intervention [30]. However, according to a recent report, retained fragments occur in 0.57% of subtotal hysterectomies [23].

The presence of uterine myomas and history of previous morcellation have recently been suggested as major risk factors for development of parasitic myomas [24]. As previously described, this is not a novel association [31–33]. A history of previous morcellation was present in 50% of patients with parasitic myomas according a recent study [27]. However, given the high rate of association and the biologic plausibility of this relationship, it is important that gynecologic surgeons consider the increased risk of parasitic myoma formation associated with morcellation of myomas during myomectomy or of the uterus during hysterectomy.

These 4 cases emphasize the importance of identifying and removing all fragments regardless of size. However, our experience shows that even when the surgeon fastidiously removes all myoma or uterine fragments, even using a morcellation bag, it is not always possible to retrieve all fragmented particles [33]. This is especially true in obese patients, in whom the visceral fat makes inspection of the peritoneal cavity more difficult.

It has been suggested that such particles, which are devoid of blood supply, will be reabsorbed by the peritoneum [34]. However, our findings and several previous reports illustrate that implantation [18–33], necrosis, or infection [30], rather than resorption, can occur.

If retained fragments can establish a blood supply and grow with benign disease, it is of concern that in situations in which an unsuspected malignant lesion is inadvertently morcellated, aberrant fragments will grow and metastasize [35]. If malignancy is suspected or known preoperatively, morcellation is formally proscribed. However, this situation may occur, even if an appropriate preoperative workup

Fig. 3. A, Laparoscopic view of parasitic myoma intimately related to the rectum and right ovary. B, During dissection of the mass, liquid content resembling old blood (e.g., endometriotic lesions) was identified.

Fig. 4. A, Vaginal examination showed the location of the mass in the anterior vaginal wall. Note that on inspection, the mass could be easily confounded with a cystocele. B, Surgical excision of the mass.
including cervical cytologic analysis and endometrial sampling are routinely performed [36].

The true incidence of inadvertent morcellation of gynecologic cancers is unknown. Morice et al [37] found a substantial but not statistically significant increase in pelvic recurrence at 3 months in 34 patients with uterine sarcoma in whom morcellation was performed during the initial surgery, compared with 89 patients in whom morcellation was not performed. Furthermore, a recent study by Einstein et al [38] supports this trend toward worse outcomes, and reports 15% upstaging in patients in whom unsuspected uterine malignant lesions were morcellated.

Diagnosis of retained fragments is challenging both clinically and radiologically [39]. Most patients have nonspecific initial symptoms including pelvic pain, dyspareunia, or abnormal vaginal bleeding (Table 1). In our experience and that of others [23,27], a history of hysterectomy, myomectomy, or presence of concurrent uterine myomas may suggest the diagnosis in many cases; however, usually the finding of a heterogeneous pelvic mass at transvaginal ultrasonography warrants exclusion of malignancy, and further examinations such measurement of CA 125 concentration and MRI are frequently performed. Because of its multiplanar capacity, MRI is the most reliable technique in such cases. It can accurately demonstrate the location of the tumor relative to adjacent structures such as the ureter, bladder, or rectum [39,40], which is critical for surgical planning [23].

In the present report, as in others [23,27], the most common location of iatrogenic parasitic myomas is the pelvis, above the paravesical, pararectal, and rectovaginal spaces. However, other locations including the upper-right quadrant [32], anterior abdominal wall [25], and previous port locations have been described [19,31].

We believe that these 4 cases demonstrate several important points that should be considered when performing laparoscopic morcellation. In all patients undergoing the procedure who are at risk of uterine malignancy (e.g., postmenopausal or with intermenstrual bleeding), uterine biopsy and cervical cytologic analysis should be performed before surgery to reduce the possible spread after unsuspected morcellation of a malignant tumor [41] despite the possibility of a false-negative result [36] or the presence of other possible causes that account for the patient’s symptoms.

At the time of the procedure, every effort should be made to remove all tissue fragments, and small-volume irrigation to minimize spread of cellular debris to the upper abdomen is recommended. Moreover, in cases of smaller surgical specimens and good exposure, morcellation inside an endoscopic bag should be attempted. Following such recommendations may decrease the chance of leaving residual tissue that may cause symptoms in the future.

In patients with a history of laparoscopic morcellation who report new or recurrent pelvic symptoms or with the finding of a new pelvic mass, iatrogenic parasitic myomas as a late complication of morcellation should be considered in the differential diagnosis.

Table 1
Reported cases and series of “iatrogenic” parasitic myomas after laparoscopic morcellation

<table>
<thead>
<tr>
<th>Source</th>
<th>No. of cases</th>
<th>Indication for surgery</th>
<th>Time since previous surgery</th>
<th>Location of parasitic myoma</th>
</tr>
</thead>
<tbody>
<tr>
<td>LaCoursiere et al [18]</td>
<td>1</td>
<td>Dyspareunia, pelvic pain</td>
<td>10 mo</td>
<td>Pelvic sidewall, bowel serosa, pouch of Douglas</td>
</tr>
<tr>
<td>Paul et al [19]</td>
<td>1</td>
<td>Data not available</td>
<td>30 mo</td>
<td>Abdominal wall (port site), right paracolic gutter, uterine fundus</td>
</tr>
<tr>
<td>Hilger et al [20]</td>
<td>1</td>
<td>Pelvic pain</td>
<td>5 yr</td>
<td>Retrocervical, rectosigmoidal junction, right ovary</td>
</tr>
<tr>
<td>Takeda et al [21]</td>
<td>1</td>
<td>Pelvic mass</td>
<td>6 yr</td>
<td>Omentum, pouch of Douglas, vesicouterine pouch, left pelvic sidewall, right round ligament</td>
</tr>
<tr>
<td>Sinha et al [22]</td>
<td>2</td>
<td>Pain, abdominal mass</td>
<td>8 and 36 mo</td>
<td>Sigmoid colon serosa, pelvic sidewall, pouch of Douglas</td>
</tr>
<tr>
<td>Donnez et al [23]</td>
<td>8</td>
<td>Pelvic pain, deep dyspareunia</td>
<td>2–9 yr</td>
<td>Paracervical, retrocervical, pararectal fossa</td>
</tr>
<tr>
<td>Kumar et al [24]</td>
<td>1</td>
<td>Abdominal distention and mass</td>
<td>1 yr</td>
<td>Disseminated peritoneal leiomyomatosis (omentum, descending colon, parietal peritoneum)</td>
</tr>
<tr>
<td>Moon et al [25]</td>
<td>1</td>
<td>Palpable mass</td>
<td>3 yr</td>
<td>Abdominal wall</td>
</tr>
<tr>
<td>Epstein et al [26]</td>
<td>1</td>
<td>Pelvic pain</td>
<td>27 mo</td>
<td>Omentum, sigmoid colon</td>
</tr>
<tr>
<td>Kho et al [27]</td>
<td>12</td>
<td>Pelvic pain and pressure, menorrhagia, dyspareunia</td>
<td>75 (2–204) mo</td>
<td>Abdominal wall, paravesical and pararectal spaces, sigmoid mesentery, bowel and bladder wall, appendix, rectovaginal space</td>
</tr>
<tr>
<td>Lieng et al [30]</td>
<td>2</td>
<td>Acute abdomen, peritonitis and abdominal distention, fever</td>
<td>4 and 11 d</td>
<td>Ileum serosa, central pelvis</td>
</tr>
<tr>
<td>Ostrzenski [31]</td>
<td>1</td>
<td>Pelvic pain</td>
<td>9 mo</td>
<td>Abdominal wall (port site)</td>
</tr>
<tr>
<td>Hutchins et al [32]</td>
<td>1</td>
<td>Abdominal pain</td>
<td>1 mo</td>
<td>Upper right quadrant (connected to gallbladder, ascending colon, omentum, and small bowel)</td>
</tr>
<tr>
<td>Hill et al [33]</td>
<td>1</td>
<td>Pelvic pain</td>
<td>3 mo</td>
<td>Pelvic sidewall</td>
</tr>
</tbody>
</table>

References