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Research Article

# Neoplasms Power Morcellation – An Emerging Risk Complicating Minimally Invasive Surgery of Uterine Mesenchymal - ∂

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## ABSTRACT

**Objective:** To determine the local incidence and clinical consequences of myoma following intraperitoneal dissemination via morcellation.

**Materials and Method:** An electronic search for laparoscopic myomectomies from the computer data base of a tertiary hospital and a separate search for sarcoma or myomata with atypical features on National Cancer Registry were carried out for the 10-year study period. The identified cases have their medical records traced, their data extracted and studied in details.

**Results:** The incidence of unexpected diagnosis i.e. variants, atypia and malignancy is 0.23% and the incidence of unexpected sarcoma is 0.10%. One of the four cases who underwent subsequent laparotomy was found to have peritoneal dissemination. She is also unfortunately the only mortality in this study.

**Conclusion:** Although laparoscopic surgeries have proven benefits over the open surgeries, dissemination of unexpected malignancy and extra-uterine seeding are major concerns currently. At the moment, maybe morcellation in the endobag or cutting the specimen using knife or scissors may be considered as alternative surgical techniques.


**KEYWORDS:** power morcellation, sarcoma, myoma with atypical features

## INTRODUCTION

Power morcellation has become a gold standard technique as part of modern minimally invasive surgery (MIS) for hysterectomy and myomectomy for the indication of benign gynaecological disease e.g. uterine fibroids. However, it carries a dire consequence if the morcellated tissues are found to be sarcomas or tumors with atypical features. This study aims to determine the local incidence and clinical consequences of these tumors following intraperitoneal dissemination via morcellation.

## MATERIALS AND METHODS

An electronic search for laparoscopic myomectomies and morcellation was carried out for the 10-year study period in a tertiary hospital. A separate search of National Cancer Registration over the same study period was carried out using keywords: leiomyosarcoma (LMS), smooth muscle tumor of uncertain malignant potential (STUMP), endometrial stromal sarcoma (ESS), cellular leiomyoma (CL) and atypical leiomyoma (AL). The identified cases that meet the study criteria i.e. sarcomas or myomata with atypical features that were operated on for presumed benign leiomyoma via laparoscopy and morcellation have their medical records traced, their data extracted and studied in details. The research protocol was approved by the Institutional Review Board.

## RESULTS

From 2004 to 2013, a total of 3013 MIS myomectomies were performed in our centre with the aid of morcellation. Seven cases were diagnosed subsequently as malignancy, leiomyoma variants or atypical lesions upon histological examinations table 1. This represents an estimated incidence of unexpected diagnosis i.e. variants, atypia and malignancy of 0.23%. The incidence of unexpected sarcoma is 0.10%. The ages of patients range from 32 to 52 years old. Two patients with AL and CL were appreciatively younger in their early thirties. Lesions' sizes were variable, but all were above 4 cm. There was a mix of solitary and multiple lesions in all categories.

For all seven cases with unexpected diagnosis, follow-up procedures were offered to complete cancer staging and evaluate potential iatrogenic peritoneal dissemination. Staging laparotomy was performed for 3 cancer patients. One STUMP patient declined surgery while the other underwent total hysterectomy and bilateral salpingo-oophorectomy. Both CL and AL patients are not keen for surgeries after discussion.

## DISCUSSION

Uterine myomata are the commonest benign uterine neoplasm and are typically found in the middle and later reproductive years. Myomectomy is the primary treatment for symptomatic myomas as an option for conservative management. It is often requested even when there is no further desire for pregnancy due to social or religious reasons. Myomectomy is increasingly performed by reproductive surgeons [1-2]. as myomata may contribute to infertility and may be responsible for serious complications during pregnancy [3]. Laparoscopic myomectomy has been in place since 1979[4] and has gained importance over the years as laparoscopic surgeries are known to reduce operative blood loss, are associated with less haemoglobin drop, more patients fully recuperated at day 15 and fewer overall complications when compared to open myomectomies. [5] In addition, it is cosmetically more desirable and appealing for younger women who do not have previous open abdominal surgeries.

Power morcellation advances the minimally invasive surgery and allows increasing number and size of fibroids to be removed laparoscopically. A power morcellator is a hollow cylindrical instrument that penetrates the abdominal wall, ending with sharp cutting blades, through which a grasper can be inserted to pull the myoma into the cylinder to cut out extractable pieces. However, morcellation is associated with spreading of cellular materials of the morcellated tissue. These loose fibroid fragments may become infarcted, necrotic or even parasitic and disseminated if they are left behind. [6] Disseminated disease was reported to occur in more than half of the cases. [7] Of note, at least 6 out of the 3013 cases of myoma morcellation in our study were associated with subsequent development of disseminated peritoneal leiomyomatosis. We reported a mini-series that were managed in our centre in the year 2013. [8] Out of the four cases who underwent subsequent laparotomy, only one was found to have peritoneal dissemination. She is unfortunately the only mortality in our study with a survival of 51 months.

In addition, there is a concern of disseminating unexpected malignancy [9-10] with an increase in mortality. Morcellation is an independent risk factor for tumor recurrence. It is prognostically associated with shorter disease-free interval and overall survival. Only morcellation, size and mitosis were found to be significant

**Table 1:** Detailed analysis of cases with unexpected diagnosis following power morcellation for suspected leiomyoma.

| Patient | Age | Diagnosis (Dx) | Size of mass (cm) | 1st peritoneal diagnosis | | 2nd peritoneal diagnosis | | Clinical Follow up | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Dx | Interval (months) | Dx | Interval (months) | Status | Treatment | Interval (months) |
| 1H | 52 | LMS | Multiple, largest 5.7 | - | 14 | | | Alive | None | 100 |
| 2Y | 43 | LMS | 9 | LMS | 1 | LMS | 11 | Deceased | Chemotherapy & radiotherapy | 51 |
| 3L | 42 | STUMP | Multiple, largest 7 | Declined surgery | | | | Alive | None | 80 |
| 4W | 41 | STUMP | Multiple, largest 12 | - | 2 | | | Alive | None | 10 |
| 5C | 47 | ESS | Multiple, largest 4.4 | - | 1 | | | Alive | None | 76 |
| 6W | 35 | AL | 4.8 | Nil | | | | Alive | None | 32 |
| 7L | 32 | CL | Multiple, largest 4.1 | Nil | | | | Alive | None | 62 |

based on multivariate analysis. [11] Unexpected diagnosis of variant leiomyoma, atypia and malignancy will occur in 0.23% of cases with a presumed pre-operative diagnosis of benign uterine leiomyoma undergoing morcellation in our study. The incidence of unexpected sarcoma is 0.10%. This rate is similar to that reported by earlier studies [7, 12] but lower than the incidence quoted by Parker WH[13] and Kho K [14].

Uterine sarcomas are rare and represent approximately 7.8% (4.9% leiomyosarcomas; 2.9% endometrial stromal sarcomas) of all invasive uterine cancers locally. [15] They are aggressive tumors with high rates of recurrence. [16] Moreover, there is no reliable pre-operative diagnostic tools to differentiate uterine sarcomas from their benign counterparts. [17] Our ten-year data showed a local sarcoma prevalence rate of 0.65% in all patients undergoing MIS or laparotomy hysterectomies and myomectomies. This is significantly higher than the unexpected post-morcellation sarcoma rate of 0.10%. This demonstrates the importance of risk stratification pre-operatively. Since the Food and Drug Administration of United States discouraged the use of laparoscopic power morcellation during hysterectomy or myomectomy for the treatment of women with uterine fibroids in their safety communication notice, one of the largest suppliers of the device had suspended the sale until recently it launched its urgent product notification in which, it stated that laparoscopic power morcellators are contraindicated for removal of uterine tissue containing suspected fibroids in patients who are peri- or post-menopausal, or candidates for en bloc tissue removal. Despite decades of experiences, the understanding of short- and long-term sequelae of the morcellation is limited. Hence it is imperative to include the possible risk of recurrence at extra-uterine locations despite the surgeon's best efforts and possible dissemination of unexpected malignancy with associated increase in mortality during pre-operative counseling for patients who are undergoing laparoscopic myomectomy and hysterectomy where morcellation is anticipated.

Whether the pros of laparoscopic surgeries can outweigh the cons of dissemination of unexpected malignancy and extra-uterine seeding or banning of the morcellation procedure will solve the issue are hotly debatable topics now especially in the world of gynaecology endoscopy. Complete abandonment of power morcellation will deprive many women from benefiting MIS surgeries. While waiting for the development of more effective diagnostic tools to differentiate between sarcomas and benign myoma[18], alternative treatment options e.g. vaginal hysterectomy, abdominal hysterectomies, laparoscopically assisted vaginal hysterectomies, natural orifices gynaecological endoscopic surgeries etc. as well as their risks and benefits should be discussed with the patient. Morcellation in a specimen bag may be considered in order to minimize the risk of spread in the peritoneal cavity. However it requires significant laparoscopic skills and experiences. There are potential concerns such as insufficient bag size, reduced visualization, disruption of the morcellator by the bag and even morcellation of the bag and surrounding organs leading to visceral injuries. Further studies are required to evaluate the safety and feasibility of this technique.

## CONCLUSION

While laparoscopic surgeries have proven benefits over the open surgeries, the concern of disseminating unexpected malignancy raised a significant issue. Informed consent is crucial at this moment. Patients should be warned about the unexpected malignancy that may spread and worsen the prognosis if power morcellation is considered the best option for benign uterine fibroids. Alternative treatment options should be discussed.

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