

Specimen Extraction Techniques Utilized in Minimally Invasive Surgery for Women with Uterine Cancer and an Enlarged Uterus: A Quality Assurance Study

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Objective: This study investigates techniques and complications of uterine extraction utilized during minimally invasive surgery for uterine malignancy and a large uterus.

Methods: Retrospective chart review 2016-2021 at a NCI-designated Cancer Center. Differences in proportions were tested by chi-square or Fisher's exact test.

Results: 958 patients with a diagnosis of uterine malignancy were surgically managed with hysterectomy from 2016 - 2021. Of these, minimally invasive surgery (MIS) was utilized for 847 patients; 53 underwent vaginal hysterectomy. The study cohort is 78 women who underwent laparoscopic or robotic assisted hysterectomy and had an enlarged uterine (> 250g). Mean age = 59 years and mean BMI = 39 kg/m². 60/78 cases included surgical lymph node assessment. Mean length of surgery was 3 hours and mean estimated blood loss was 117cc. Mean specimen weight was 407g (range 250-1268g). 31 specimens were removed transvaginally intact and 26 were removed transvaginally within a specimen bag (14 morcellated). 3 specimens had incidental morcellation in the vagina. 18 specimens were extracted via mini-laparotomy. Mean specimen weight by extraction technique is: intact vaginal extraction=307g, vaginal removal in specimen bag= 337g, incidentally morcellated= 321g, vaginal morcellation in specimen bag= 361g, and mini-laparotomy= 677g. Specimens removed by small laparotomy were significantly larger and associated with greater operative time (p<0.05). 27 patients incurred a perineal or vaginal laceration. Laceration rate by extraction technique is: intact vaginal extraction=32%, vaginal removal in specimen bag= 58%, incidental morcellation= 67%, and vaginal morcellation in specimen bag= 50%. Pathology was not reportedly compromised in any of the 17 patients who had morcellation of the uterus, and treatment recommendations did not appear to be altered. 51% of the cohort received adjuvant treatment; 19% received chemotherapy and 32% received radiation. Of those patients whose specimen was morcellated in the vagina, none received adjuvant therapy. Duration of available follow-up ranged from 6 months - 5 years. There were 8 cases of cancer recurrence with progression free interval ranging from 4 - 27 months. 6 of these cases involved adverse histologic subtypes. 4 patients had cancer recurrence within one year of surgery, and the uterine specimen was morcellated in 3 of these cases. There were 6 deaths in our study population; 5 were due to uterine cancer sequelae and one patient had concurrent breast cancer. Perioperative complications in this cohort were minimal and not affected by specimen extraction technique. One patient received a perioperative blood transfusion. There were no perioperative ICU admissions, deaths, or reoperations. One patient was readmitted within 30 days of surgery for management of pulmonary embolism. One patient was readmitted on post-operative day 11 for pelvic abscess managed with antibiotics alone.

Conclusions: Minimally invasive hysterectomy was feasible in the majority of patients with uterine malignancy who underwent surgical management. Of these, 8.1% had enlarged uteri that were extracted by several techniques, including contained morcellation. Morcellation did not compromise pathologic analysis, treatment recommendations or prognosis.