Robotic Hysterectomy in Obese Cancer Patients with Concomitant Abdominoplasty

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Introduction

Endometrial cancer is the seventh most common cancer in women worldwide, and the incidence has increased with the rise in the prevalence of obesity [1,2]. Obesity is a well-known risk factor for endometrial cancer due to the excess production of estrone. Approximately 39% of endometrial cancer is caused by obesity [2]. Optimal management of these patients includes minimally invasive hysterectomy followed by chemotherapy and radiation [3]. However, there are technical challenges directly related to obesity.

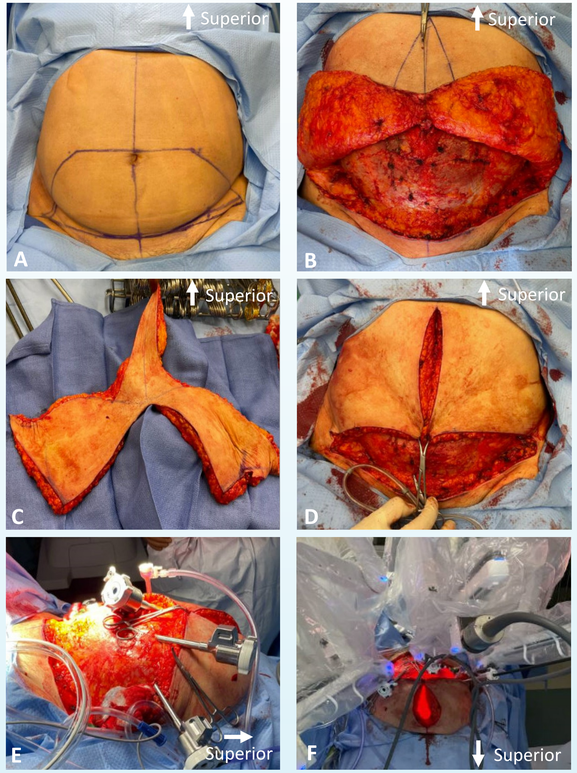
Historically, these procedures were done as open abdominal surgery and then progressed to minimally invasive or laparoscopic surgery as the techniques became more widely used. While a minimally invasive hysterectomy has benefits in lower rate of intraoperative complications, decreased blood loss, shorter hospital stays, faster return of bowel activity, and quicker return to activities in daily life when compared to open abdominal surgery, there are some limitations [3]. A limitation in a robotic hysterectomy is difficulty accessing appropriate landmarks and maintaining stable vital signs in patients with morbid obesity. This is largely due in part to the large pannus and asymmetric abdominal adiposity compressing the abdomen and chest wall seen in these patients [4]. Because of these limitations, patients have been advised against minimally invasive surgery or have high rates of laparotomy conversion due to their inability to tolerate the procedure [5,6]. It has been reported that conversion from a minimally invasive procedure to laparotomy occurred in 17.5% of patients with a BMI of 25 kg/m^2, 26.5% of patients with a BMI of 34 to 35 kg/m^2, and 57.1% of patients with a BMI greater than 40 kg/m^2 due to the restriction in surgical movements and patient tolerance [5,6]. However, concomitant abdominoplasty allows for the removal of excess adipose tissue obstructing surgical access and allows for easy port placement, thus facilitating the procedure.

Methodology

Between the dates of January 2016 and April 2021, eight patients were selected for a concomitant abdominoplasty and of these patients, three had a diagnosis of endometrial carcinoma, a BMI ≥35, and asymmetric lipodystrophy requiring a robotic hysterectomy. Another patient was included in the study whose BMI was below the 35 cutoff for comparison. Outcomes and complications were determined through retrospective evaluation of patient charts and these values were compared to national averages as determined by a literature review on robotic hysterectomy. The postoperative aesthetic appearance of the abdominal wall was also noted on follow-up clinic visits. Subjective surgeon satisfaction was also noted postoperatively. The same plastic surgeon and gynecological oncology specialist performed all the procedures.

Procedure

The procedure proposed is shown below with the head of the patient denoted by an arrow. The preop markings (A), initial incision (B), resected specimen (C), final skin incision (D), port insertion (E), and docking of the Da Vinci robot (F). The initial incision is made by the plastic surgeon with appropriate undermining and tissue resection in line with a standard fleur-de-lis abdominoplasty. The incision is then held in close proximity using staples or clamps. The Da Vinci ports were then placed in standard fashion and the robot was docked. The hysterectomy was completed in a standard fashion by the gynecological oncology specialist. The Da Vinci robot was then undocked and the plastic surgeon closed the abdominoplasty incisions. There were no specific changes to the procedures with only the delay in the abdominoplasty closure to note.



Results

Three patients met inclusion criteria and revealed no overall increase in complication rates. One of the three patients had small areas of skin edge separation that healed by secondary intention which was categorized as a minor complication but had no long-term complications. There were less than the average major complications while also subjectively proving to be a simpler procedure in terms of gaining access to the patient's anatomical landmarks and performing the robotic hysterectomy. There was also a decrease on average of total time spent operating from in-room to out of room when compared to the independent procedures (Table 1). A fourth patient was included in the findings for comparison in addition to a large-scale evaluation of the procedures by themselves (Table 2).

* Requiring Surgical Correction	Age	BMI	Length of Procedure (min)	Minor Complications	Major Complications (Seroma*, Dehiscence*, Hematoma*)	Chronic Medical Conditions
Patient 1	67	52	388	N/A	N/A	Hypertension, Hyperlipidemia
Patient 2	52	66.79	371	N/A	N/A	Hypertension, Hyperlipidemia, T2DM
Patient 3	66	56.5	540	Skin edge separation	N/A	Hyperlipidemia, T2DM
Average	62	58.43	433	(1/3) 33%	(0/3) 0%	Smoking – 0% Hypertension – 66% Hyperlipidemia – 100% Diabetes Mellitus – 66%

(Table 1) Patient Demographic and Results

* - Requiring Surgical Correction	Age	BMI	Length of Procedure (min)	Minor Complications	Major Complications (Seroma*, Dehiscence*, Hematoma*)	Chronic Medical Conditions
Patient 4	62	26.9	306	N/A	N/A	Hypertension, Hyperlipidemia, T2DM
Abdominal Panniculectomy (10-year review) [7,8]	51.7	33	300	~33%	7.2-26.3%	Smoking – 42.4% Hypertension – 42.4% Hyperlipidemia – 46.2% Diabetes Mellitus – 29.4%
Robotic Hysterectomy (Overview) [9]	46	22.2	179	N/A	6.5-14.8%	Not reported

(Table 2) Patient Comparison

Conclusion

While obesity increases in prevalence in the United States, the prevalence of endometrial carcinoma and the need for hysterectomies has also increased. As the standard of care for these patients is robotic hysterectomy, more of these procedures are being performed but with increasing challenges directly correlated with the change in population and the increase in adiposity. Concomitant robotic hysterectomy and abdominoplasty allows for the removal of the excess adipose tissue obstructing the surgeon's access. We demonstrate that this is helpful in robotic hysterectomy for endometrial carcinoma. This technique may be of benefit for other robotic operations in morbidly obese patients. While there have been studies showing the benefits of simultaneous abdominoplasty with open abdominal surgery, there is no specific research elucidating the impact that a concomitant abdominoplasty has on a robotic procedure. Future research comparing complications, objective surgical success, and objective indications for the combined procedure needs to be performed on a larger patient population.

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