

Robotic surgery in morbidly obese women with endometrial cancer in Singapore

Dear Editor,

The standard of care for endometrial cancer is a total hysterectomy with bilateral salpingo-oophorectomy, and pelvic lymph node dissection (THBSO-PLND). Obesity is a known risk factor for endometrial cancer, and obese patients are challenging to operate on due to their anatomy and comorbidities. A recent database search showed a limited number of studies on robotic surgeries performed in obese women for endometrial cancer, with the highest body mass index (BMI) reported in Asia as: 31.8kg/m² in Taiwan,¹ 30.3kg/m² in South Korea,² 35.6kg/m² in Thailand³ and 33.2kg/m² in Singapore.⁴ There is a dearth of published discussion on robotic surgery in morbidly obese women, in hand with concern about its safety and efficacy as a surgical modality. We describe our unique experience and outcomes of robotic surgery in morbidly obese women with endometrial cancer at the Obstetrics and Gynaecology Department at Singapore General Hospital, Singapore. We posit that robotic surgery technology could allow for the standard of care for endometrial cancer (i.e. THBSO-PLND) to be offered to all patients regardless of BMI.

We performed a retrospective analysis of 25 female patients with BMI >40kg/m², who underwent robotic THBSO-PLND surgery from January 2016 to December 2021. The average age was 53 (range 30–78) years and average BMI was 45.86kg/m² (range 40.0–63.0kg/m²). There were 17 (68%) patients who were nulliparous. Twenty-two (88%) patients were assessed with the snoring history, tired during the day, observed stop of breathing while sleeping, high blood pressure, BMI >35kg/m², age >50 years, neck circumference >40cm and male gender (STOP-BANG) score, with an average score of 3.48 (a score of 3–4 was considered intermediate risk for sleep apnoea). The remaining 3 patients were assessed with the apnoea-hypopnoea index score, where a score of >30 was considered severe. Their scores were 33, 53 and 66. Seven (46%) patients also had ischaemic heart disease, 5 (22%) had pre-existing diabetes mellitus, 4 (18%) had sleep apnoea and 4 had chronic kidney disease. Six patients had previous abdominal or pelvic surgery.

We analysed our operative outcomes and compared our data with other studies with similar demographics. Twenty of our patients underwent THBSO-PLND

while only 3 underwent THBSO without PLND. Two patients had total hysterectomy with bilateral salpingectomy (THBS)-PLND, with ovaries conserved. Eleven patients also required adhesiolysis and 2 patients had omentectomy. Only 3 patients required a mini-laparotomy for the retrieval of uterus (uterus weight of 346g, 439g and 525g). The average uterus weight across all patients was 219g. The average operative time was 240min (range 155–365min) and estimated average blood loss was 149mL. Our study was comparable to the findings of 5 other studies^{5–9} that were selected after conducting a thorough literature search on PubMed and Cochrane databases, and fulfilling exclusion criteria (Table 1).

Firstly, we analysed the successful completion of intended surgery. Laparotomy has increased risks of wound infection and venous thromboembolism, in addition to greater analgesia requirements. Laparoscopic approach circumvents these issues, but intra-abdominal insufflation of carbon dioxide and Trendelenburg positioning for visualisation of organs both contribute to inadequate ventilation in obesity. The rate of conversion has been demonstrated to positively correlate with BMI. Robotic surgery circumvents these issues by providing better visualisation of minute structures.¹⁰ In our study, none required conversion to laparotomy.

We also analysed the postoperative recovery and complications in our patients. All patients were routinely transferred to high dependency unit (HDU) per requirements for anaesthesia and routinely stepped down to the general ward the next morning. Only 1 patient was kept in the HDU for 1 additional day for closer monitoring, but she also had an unremarkable postoperative recovery. No patient required intensive care unit admission postoperatively. There were 80% of patients ambulated on postoperative day (POD) 1, 72% opened bowels on POD 1, and the average POD 1 pain score was 2. One patient was readmitted on POD 6 for post-operative ileus and another patient was readmitted for post-site haematoma, both of whom were managed conservatively.

Three patients who were initially radiologically classified as stage 1 were revised to stage 3 postoperatively. The first patient was reported to have a 2cm tumour on the magnetic resonance imaging (MRI) scan; however, intraoperative findings and final histology showed ovarian metastasis. She subsequently received

Table 1. Summary of patient demographics in our study compared with studies where robotic surgery was performed in obese women with endometrial cancer, and their operative procedures and outcomes.

Studies	Gruhl et al.	Bernardini et al. ⁵	Corrado et al. ⁶	Fornalik et al. ⁷	Shah et al. ⁸	King et al. ⁹
Country of study	Singapore	Canada	Italy	US	US	US
Total no. of patients	25	45	70	76	43	188
Patient demographics						
Mean age, years	53.0	61.0	60.7	61.0	58.2	59.9
Mean BMI, kg/m ²	45.9	40.3	43.6	47	40.5	45.5
Other comorbidities, no. (%)						
Chronic HTN	14 (56.0)					138 (73.4)
Diabetes mellitus	5 (20.0)	51% had ≥3 comorbidities	75% had comorbidities	46.1% had ≥4 comorbidities	Not reported	73 (38.8)
OSA	5 (20.0)					26 (13.8)
Previous surgeries	18 (72.0)	17 (37.8)	37 (52.9)	Not reported	29 (67.4)	117 (62.2)
Preoperative radiological classification stage, no. (%)						
1A	19 (76.0)	8 (17.8)	42 (60.0)	Not reported	Not reported	133 (70.7)
1B	4 (16.0)	16 (35.6)	12 (17.1)	Not reported	Not reported	14 (7.4)
1C	0	7 (15.6)	0	Not reported	Not reported	Not reported
2	1 (4.0)	3 (6.7)	8 (11.4)	Not reported	Not reported	13 (6.9)
≥3	1 (4.0)	10 (22)	8 (11.4)	8 (10.5)	Not reported	5 (2.7)
Surgeries performed, %						
THBSO	16.0	40.0	61.4	3.9	62.1	88.9
THBSO-PLND	84.0	60.0	38.6	96.1	37.9	11.1
Conversion to laparotomy	0	0	0	0	0	1.1
Operative outcome						
Mean operative duration, min	240	270	164.3	203	252.6	173.3
Mean estimated blood loss, mL	149	200	73.2	150	41.2	74.4
Mean uterus weight, g	219	Not reported	Not reported	Not reported	176.3	Not reported
Final postoperative histology grade						
1A, no. (%)	15 (60.0)	27 (60.0)	19 (27.1)	Not reported	Not reported	99 (52.7)
1B, no. (%)	5 (20.0)			Not reported	Not reported	
2, no. (%)	1 (4.0)	5 (11.1)	36 (51.4)	Not reported	Not reported	45 (23.9)
≥3, no. (%)	4 (16.0)	5 (11.1)	15 (21.4)	Not reported	Not reported	42 (22.3)
Postoperative complications, no. (%)	2 (8.0)	8 (17.7)	6 (8.6)	11 (14.5)	3 (7.0)	11 (5.9)
5-year survival, %	92.0	Not reported	Not reported	Not reported (90-day mortality=0)	Not reported	Not reported
Recurrence rate of disease in 3 years, %	4.0	Not reported	7.1	Not reported	Not reported	Not reported

BMI: body mass index; HTN: hypertension; OSA: obstructive sleep apnoea; PLND: pelvic lymph node dissection; THBSO: total hysterectomy with bilateral salpingo-oophorectomy

Superscript numbers: Refer to REFERENCES

3 cycles chemotherapy followed by pelvic radiotherapy, and her 5-year postoperative follow-up showed no recurrence of disease.

The second patient had an MRI of the pelvis, which showed tumour confined to the endometrium with no extension beyond the cervix. She underwent a hysteroscopy, dilatation and curettage, and was noted to have cervical involvement with histology confirming grade 3 cancer. She subsequently underwent modified radical hysterectomy. Final histology confirmed stage 3B cancer, with microscopic metastasis to the vagina. Surgical margins were clear. This patient was subsequently offered chemotherapy and pelvic radiotherapy. She was admitted for urinary tract infection 18 months later, and computed tomography (CT) scan showed lymph node recurrence with hydronephrosis. She is on palliative chemotherapy with doxorubicin at the time of writing.

The third patient was classified as radiology stage 1A, with a 3.3cm tumour confined within the endometrial cavity on her MRI scan. This was subsequently revised to stage 3C on final histology with pelvic lymph node metastasis. She completed 6 cycles of chemotherapy and radiotherapy, with no disease recurrence to date.

We had 1 patient with stage 2 cancer who underwent preoperative vault therapy. Postoperatively, no adjuvant therapy was recommended. At her 1-year follow-up, CT scan did not show any recurrence of disease.

The 30-day mortality rate is 0. One patient died 13 months after her surgery. She developed bowel obstruction requiring emergency surgery, and her postoperative recovery was complicated with sepsis and multi-organ failure. Another patient died 3 years and 3 months post operation from recurrence of endometrial cancer.

Limitations of our study include a small sample size and single institution recruitment. However, robotic surgery is a promising modality for surgical management of obese patients with endometrial cancer. With further research, robotic surgery can eventually allow for the standard of care for endometrial cancer to be possible for women with obesity. Robotic surgery is a safe and effective surgical approach for endometrial cancer in morbidly obese patients.

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