



# Effect of body mass index on total laparoscopic hysterectomy outcomes for benign conditions: a single-centre retrospective study



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## Introduction

Obesity rates are increasing worldwide. According to the most recent data from the Australian Bureau of Statistics Australian Health Survey, the prevalence of obesity in the Australian population has increased from 18.7% in 1995 to 27.5% in 2011-12. Caring for obese surgical patients requires specific anaesthetic and surgical considerations. From a surgical perspective, obesity is associated with increased risk of wound infection and venous thromboembolism. The goal of this study was to investigate how increased body mass index (BMI) affects operative outcomes and complications in women undergoing laparoscopic hysterectomy for benign indications. Previous studies have inconsistently found increased operating time, increased intra-operative blood loss and increased conversion to laparotomy in obese patients requiring laparoscopic hysterectomy [1-6].

## Methods

Admission data was requested for all patients undergoing laparoscopic hysterectomy over a three-year period between June 2014 - June 2017. The following cases were excluded: cases performed by gynaecology oncology team; laparoscopic assisted vaginal hysterectomies; cancer of cervix, uterus or ovary; and planned total abdominal hysterectomies that were coded incorrectly. Data was collected using electronic medical records.

Outcomes and complications in obese patients were compared using a definition of BMI less than or equal to 29 (not obese) and BMI more than or equal to 30 (obese). A subgroup analysis was also performed on women with BMI 25-29 (overweight). Data analysis was carried out using two-sided 95% confidence interval with  $p < 0.05$  considered significant.

A total of 233 total laparoscopic hysterectomies were performed for benign indications by general gynaecology between June 2014 - June 2017. All operations were performed under general anaesthetic by consultant gynaecologists or trainees with supervision using standard technique for total laparoscopic hysterectomy.

**Table 1: Outcomes of laparoscopic hysterectomy according to BMI**

	BMI $\geq 30$ no of patients (%)	BMI $\leq 29$ no of patients (%)
Number of patients	95	138
Average age (years)	44.0	45.5
Duration of surgery (min)	211	200
Average EBL (ml)	206	218
Transfusion	0 (0%)	2 (1.4%)
Convert to open	1 (1.1%)	1 (0.7%)
Return to OT	3 (3.2%)	1 (0.7%)
Infection	9 (9.4%)	9 (6.5%)
DVT / PE	0 (0%)	1 (0.7%)
Bowel injury	1 (1.1%)	1 (0.7%)
Bladder / ureteric injury	2 (2.1%)	2 (1.4%)
Other complications	3 (3.2%)	2 (1.4%)

## Most common histology findings

- Uterine fibroids (42%)
- Adenomyosis (30%)
- Normal (23%)
- Endometriosis (18%)
- Benign ovarian cyst (4%)
- Cervical dysplasia (3%)
- Endometrial polyp (2%)

NB: some patients had more than one pathology

## Complications of laparoscopic hysterectomy

- Infection
  - Vaginal vault infection
  - Wound infection
  - Urinary tract infection
  - Pneumonia
  - Intra-abdominal infection
  - Bacteraemia
- Convert to open for bulky uterus or fibroids
- Return to theatre following ureteric injury
- Bowel injuries were all serosal tears
- Pulmonary embolus
- Other complications
  - Liver perforation on entry
  - Ileus
  - Wound dehiscence
  - R leg compartment syndrome requiring fasciotomy

## Discussion

Some trends were observed in the data that did not reach statistical significance due to the small sample size and small number of complications. The following outcomes are discussed in terms of BMI  $\geq 30$  vs.  $\leq 29$ :

- **Average age similar** (44.0 yrs vs. 45.5 yrs)
- **Duration of surgery similar** (211min vs. 200min)
- **Estimated blood loss similar** (206ml vs. 218ml)
- Transfusion more common in lower BMI (0% vs. 1.4%,  $p=0.92$ )
- Conversion to open similar (1.1% vs. 0.7%,  $p=0.39$ )
- **Return to OT more common** (3.2% vs. 0.7%,  $p=0.10$ )
- **Infection more common** (9.4% vs. 6.5%,  $p=0.21$ )
- PE was observed in one woman who was not obese
- Bowel injury similar (1.1% vs. 0.7%,  $p=0.39$ )
- Bladder/ureteric injury similar (2.1% vs. 1.4%,  $p=0.36$ )

Composite outcome of all complications (including blood transfusion, conversion to open, return to theatre, infection, DVT/PE, bowel injury, bladder/ureteric injury and other complications) was more common in obese women but not statistically significant (20% vs. 13.7%,  $p=0.1083$ ). Subgroup analysis of overweight women with BMI 25-29 (90 patients) accounted for the majority of complications in BMI  $\leq 29$ . **Overall complication rate was significantly more common in women who were overweight or obese with BMI  $\geq 25$  compared to normal BMI  $\leq 24$  (19.5% vs. 4.2%,  $p=0.0001$ ).**

Our results are similar to previous studies that have shown no significant difference in duration of operating time and estimated blood loss in obese women. However, some key limitations of this study include inconsistent recording of estimated blood loss and operating time as well as small sample size. There were also some exceptionally long cases (up to 14 hrs) for severe endometriosis that did not appear to skew the data on subgroup analysis..

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