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# Perioperative and Postoperative Outcomes of Morbidly Obese Patients Undergoing Primary Elective Total Hip Arthroplasty with a Muscle Sparing Approach

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## Introduction

- Obesity is associated with an increased risk of complications after total hip arthroplasty (THA), including infection and dislocation.
- Due to the higher risk of osteoarthritis in obese individuals, understanding factors that can reduce the risk of complications is important.
- This study examined the outcomes of morbidly obese (BMI ≥ 40) compared to healthy weight patients (BMI between 18.5-24.9 kg/m<sup>2</sup>) who underwent a THA with the ABLE approach.
- The ABLE approach:
  - This approach uses the interval between the anterior aspect of the gluteus medius and the posterior aspect of the tensor fascia lata.
  - ABLE is minimally invasive, muscle sparing, and is associated with less painful postoperative results and quicker recovery.
- Research on postoperative and perioperative outcomes of THA in morbidly obese patients using the ABLE approach has not previously been studied.

## Methods

- This study is a retrospective analysis of patients who underwent a primary unilateral THA with the ABLE approach by three surgeons at MMC between April 2013 and August 2020.
- Using CDC classifications of obesity, 341 individuals who were considered morbidly obese (BMI ≥ 40 kg/m<sup>2</sup>) and 1,140 individuals who were a healthy weight (BMI 18.5-25 kg/m<sup>2</sup>) at the time of surgery were included in this study.
- The perioperative variables assessed include: type and duration of anesthesia, length of surgery, length of stay, transfusion rates, discharge disposition, ED visits (within 30 days), and hospital readmissions (within 90 days).
- Postoperative complications assessed include: pulmonary embolism (within 30 days), fracture (within 90 days), dislocation (within 90 days), joint infection (within 90 days), and wound infection (within 90 days). Clinical outcomes were obtained via our standard pre and postoperative PROM questionnaires.
- Patients were identified using a data pull from EPIC and analyzed using Microsoft Excel.

## Discussion

- The risk factors of obese patients undergoing THA are well studied, however this is the first known study to compare outcomes of THA stratified by BMI using the ABLE approach.
- The demand for THA is increasing globally and the approaches and methods for performing the procedure are becoming more refined. As such, it is important to understand the implications of the different methodologies of THAs.
- Our perioperative results are consistent with other THA approaches described in the literature, however our complication results suggest a better outcome for morbidly obese patients using the ABLE approach than traditional approaches.
- Considering the projected increase of obesity and demand for THA, our findings suggest that the ABLE approach is an appropriate option for morbidly obese patients.

## Results

Table 1. Patient Demographics.

	Healthy Weight (18.5 - 24.9 kg/m <sup>2</sup> ) N = 1440	Morbidly Obese ( > 40 kg/m <sup>2</sup> ) N = 341	P-Value
Age^	67.3 ± 10.5	61.3 ± 9.2	<0.001
Sex*			0.034
Female	1015 (70.5%)	223 (65.4%)	
Male	425 (29.5%)	118 (34.6%)	
BMI^	22.7 ± 1.6	44.1 ± 4.0	<0.001
ASA Classification^	2.0 ± 0.5	2.6 ± 0.5	<0.001
Complexity^	3.9 ± 1.9	4.8 ± 2.0	<0.001
Pre-operative VAS Pain Score^	5.3 ± 2.2	6.9 ± 2.0	<0.001
Pre-operative UCLA Score^	4.7 ± 1.8	3.1 ± 1.3	<0.001
*Count and percent of total ^Mean and standard deviation			

- The morbidly obese group was statistically younger, more likely to be male, and had higher complexity and ASA scores.
- The morbidly obese group scored significantly higher on the preoperative VAS Pain Score and lower on the UCLA functional scores, indicating higher pain and lower function than healthy weight patients preoperatively.

Table 3. Postoperative Complications:

	Healthy Weight (18.5 - 24.9 kg/m <sup>2</sup> ) N = 1440	Morbidly Obese ( ≥ 40 kg/m <sup>2</sup> ) N = 341	P-Value
Fracture	5 (0.35%)	3 (0.88%)	0.116
Infection	2 (0.14%)	5 (1.47%)	0.002
PE/DVT	0 (0.00%)	0 (0.00%)	No Difference
Dislocation	1 (0.07%)	0 (0.00%)	0.404

- The morbidly obese group had a significantly higher rate of infection than the healthy weight group.
- Other postoperative complications including fracture, PE/DVT, and dislocation showed no significant difference.

Table 2. Perioperative and Postoperative Data:

	Healthy Weight (18.5 - 24.9 kg/m <sup>2</sup> ) N = 1440	Morbidly Obese ( > 40 kg/m <sup>2</sup> ) N = 341	P-Value
Anesthesia*			0.17
General	1398 (97.01%)	334 (97.95%)	
Spinal	42 (2.92%)	7 (2.05%)	
Anesthesia duration (minutes)^	103.9 ± 19.9	119.3 ± 20.4	<0.001
Length of surgery (minutes)^	62.0 ± 17.9	73.5 ± 16.6	<0.001
Estimated blood loss (mL)^	208.9 ± 71.4	248.1 ± 88.7	<0.001
Blood Transfusion*			0.39
Yes	11 (0.76%)	3 (0.88%)	
No	1429 (99.24%)	338 (99.12%)	
Length of stay (days)^	1.36 ± 0.63	1.50 ± 0.79	0.001
ED visit within 30 days*			0.440
Yes	32 (2.22%)	7 (2.05%)	
No	1408 (97.78%)	334 (97.95%)	
Readmission within 90 days*			0.159
Yes	40 (2.78%)	13 (3.81%)	
No	1400 (97.22%)	328 (96.19%)	
Discharge disposition*			0.536
Home or Self Care	1327 (92.15%)	310 (90.91%)	
Rehab or Skilled Nursing Facility	113 (7.85%)	31 (9.09%)	
*Count and percent of total ^Mean and standard deviation			

- The average anesthesia duration was significantly higher in the morbidly obese group than healthy weight.
- The average total length of surgery, determined by incision start to incision close, was longer in the morbidly obese patients than healthy weight.
- The estimated blood loss in morbidly obese patients was significantly higher than the healthy weight patients.
- The average length of stay for the morbidly obese group was significantly higher than healthy weight group.

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