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Brian J. McGrory
Maine Medical Center

George Babikian
Maine Medical Center

Adam Rana
Maine Medical Center

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Callahan M. Sturgeon[1], BS, Bailey Shevenell[1], BA, Johanna Mackenzie[1], MPH, Katerina Tansijevic[3], Brian McGrory[1, 2], MD, George Babikian[1, 2], MD, Adam Rana[1, 2], MD

[1]Maine Medical Partners Orthopedics Division of Joint Replacement, Falmouth, ME, [2]Maine Medical Center, Portland, ME, [3]Colby College, Waterville, ME

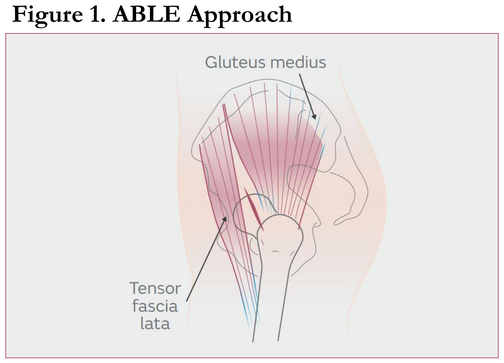
Maine Medical PARTNERS

A department of Maine Medical Center

Introduction

- Total Hip Arthroplasty (THA) procedures are becoming increasingly common globally.
- There is current debate surrounding the efficacy of simultaneous versus staged bilateral total hip arthroplasty, mainly with regards to patient outcomes and complications.
- This study examines the perioperative and postoperative outcomes of simultaneous and staged bilateral THA procedures using the Anterior Based Muscle Sparing (ABMS) approach, also known as the ABLE Advanced Anterior 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 (Figure 1).
  - ABLE is minimally invasive, muscle sparing, and is associated with less painful postoperative results and quicker recovery.
- The efficacy of both procedures was considered with regards to perioperative results and short to midterm postoperative outcomes.

Figure 1. ABLE Approach



Methods

- This study is a retrospective analysis of patients who underwent either a primary simultaneous or staged bilateral THA with the ABMS approach by three surgeons at MMC between April 2013 and August 2020.
  - Staged THA was defined as any patient who had bilateral THA performed in two separate surgeries within 364 days of one another.
- 382 patients that had undergone staged bilateral THA (764 surgeries) and 146 patients that had undergone simultaneous bilateral THA were included in this study.
  - Patients were identified using a data pull from EPIC, MMC's EMR.
  - Surgeons at our institution determined to move forward with staged or simultaneous THA on a case by case basis.
- 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 patient reported outcome measurements (PROM) questionnaires.

Results

Table 1. Patient Demographics.

Baseline Characteristic(N ± Std)	Simultaneous (N=142)	Staged (N=379)	P-value
Age(years)**	57.7(30-75) ± 8.9	63.7(35-92) ± 9.7	**<.0001**
Sex*			**0.0017**
Female	59.0 (41.5%)	216.0 (57.0%)	
Male	83.0 (58.5%)	163.0 (43.0%)	
BMI(kg/m²)	28.6(16.3-41.3) ± 4.9	30.3(17.6- 55.4) ± 6.8	**<.0001**
BMI Categories*			
Underweight	3.0 (2.1%)	4.0 (1.1%)	
Healthy Weight	32.0 (22.5%)	88.0 (23.2%)	
Overweight	55.0 (38.7%)	107.0 (28.2%)	
Obese	52.0 (36.6%)	180.0 (47.5%)	
ASA Classification	2.0 ± 0.5	2.1 ± 0.5	
Primary Diagnosis*			0.8785
Osteoarthritis	140.0(98.6%)	374.0 (98.7%)	
Avascular necrosis	2.0(1.4%)	5(1.3%)	

*N(% of total)
**N(range) ± SD

- The simultaneous group was statistically younger, more likely to be male, and had a lower average BMI than the staged group.

Table 3. Postoperative Complications:

Variable (N (%))	Simultaneous	Staged
Postoperative Complications	0(0%)	11(1.5%)
Pulmonary Embolism (30 days)	0	1
Fracture (90 days)	0	4
Dislocation (90 days)	0	2
Joint Infection (90 days)	0	1
Wound Infection (90 days)	0	3

Table 2. Perioperative and Postoperative Data:

Variable (Mean ± SD)	Simultaneous	Staged	P-Value
Anesthesia*			0.5515
General	138 (97.9%)	739(96.9%)	
Spinal	3 (2.1%)	24(3.1%)	
Anesthesia Duration(min)	187.7 ± 20.9	216.0 ± 37.4	**<.0001**
Length of surgery (min)	140 ± 18.8	130.4 ± 32.8	**<.0001**
Length of stay (Days)	2.0 ± 0.8	2.8 ± 1.3	**<.0001**
Transfusion(Within 7 days of surgery)*			0.338
Yes	2 (1.4%)	5(0.7%)	
No	140 (98.6%)	753(99.3%)	
Discharge Disposition*			0.3982
Home	135(95.0%)	702(92.6)	
Skilled Nursing Facility	7(5%)	49(6.5%)	
Rehab Facility	0	7(0.9%)	
ED Visit within 30 Days			0.4722
Yes	1(0.7%)	12(1.6%)	
No	141 (99.3%)	746(98.4%)	
Readmissions(within 90 days)			0.4722
Yes	1(0.7%)	12(1.6%)	
No	141(99.3%)	746(98.4%)	

*N (%)

- The average anesthesia duration for the simultaneous group was significantly shorter than staged.
- The average total length of surgery, determined by incision start to incision close, was longer in the simultaneous group than the staged group.
- The average length of stay for the simultaneous group was significantly shorter than staged group.
- There was no difference in transfusion rates or discharge disposition, ER visit within 30 days, readmission within 90 days, or postoperative complications.

Discussion

- The demand for Total Hip Arthroplasty 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 study corroborated other research that showed a reduced length of stay for simultaneous group. Length of stay continues to be a very important metric for hospitals and patients alike, it impacts costs and especially in light of the COVID-19 pandemic, is important to minimize time in the hospital.
- Our results show that simultaneous bilateral THA under the ABLE approach compares favorably with staged THA. Further benefits of simultaneous THA include reduced hospital visits, one single procedure, and one recovery period. The efficacy of simultaneous bilateral THA, as shown by shorter anesthesia time and shorter length of stay with minimal postoperative complications, is comparable to staged bilateral THA and based on our results, simultaneous THA under the ABLE approach is a safe procedure with positive outcomes.

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