Intraoperative Conversion of Total Hip to Hemiarthroplasty in a Super Obese Patient

Li R1, Kim SJ1*, Tiwari B1, Hirsh DM1, Courtney J1

1Department of Orthopaedic Surgery, Montefiore Medical Center, USA

*Corresponding author: Dr. Sun Jin Kim, Montefiore medical Center, 1250 Waters Place, 11th Floor. Bronx, NY 10461, Tel: 347-577-4410; Email: sukim@montefiore.org

Received: 09-13-2014
Accepted: 09-23-2014
Published: 09-26-2014

Copyright: © 2014 Kim

Abstract
Super obesity, defined as a BMI≥50, has been shown to increase short- and long-term complications in total hip arthroplasty. Obesity is associated with difficult surgical exposures, increased operative times, and acetabular component malpositioning. We present a case of a 47-year-old super obese female who required intraoperative conversion of a total hip to hemiarthroplasty due to poor exposure of the acetabulum.

Keywords: Total Hip Arthroplasty; Hemiarthroplasty; Super Obesity

Introduction

The World Health Organization (WHO) defines obesity as a body mass index (BMI)≥30 kg/m², morbid obesity as BMI≥40 kg/m², and super obesity as BMI≥50 kg/m² [1]. Obesity is currently a major public health concern in the United States due to its known negative impact on health and increasing prevalence [2-4]. Between the years 2000-2005, the prevalence of a BMI>30 increased by 24%, BMI>40 increased twice as fast by 52%, and BMI>50 increased three times as fast (75% higher in 2005 than in 2000) [5].

While several studies have reported increased medical and mechanical complications in total hip replacement patients associated with morbid obesity [6-8], other studies have found no differences in this patient population [9,10]. Super obesity, defined as a BMI≥50, has been shown to increase short and long term complications in patients undergoing total hip arthroplasty (THA) [7,8]. While it is known that BMI is directly correlated with increased operative times [11], there is a sparsity of literature regarding the intraoperative difficulties and complications associated with performing a THA in this patient population.

We present a case of a 47-year-old super obese female who was originally planned for THA by a fellowship trained arthroplasty surgeon. Due to inadequate visualization and exposure of the acetabulum, decision was made intraoperatively to convert from total hip to hemiarthroplasty.

Case Report

A 47-year-old female presented to the orthopedic surgeon’s office with a chief complaint of 8 years of severe left hip pain localized to the groin and thigh, requiring use of a walker. She was unable to comply with recommendations for weight loss and did not wish to undergo bariatric surgery. Her past medical history was significant for hypertension and asthma. Physical exam revealed a super obese middle-aged female with a BMI of 65.9 kg/m². The patient walked with a severe limp and had very limited range of motion to her left hip secondary to pain. Plain radiographs revealed severe arthritic changes with femoral head collapse (Figure 1). After an extensive discussion regarding the risks and complications of surgery, she elected to undergo a left total hip arthroplasty in order to restore function and relieve pain. Preoperative medical clearance was obtained from her primary doctor.
Figure 1. A. Preoperative AP radiograph demonstrating severe osteoarthritis of the left hip. B. Postoperative AP radiograph demonstrating hemiarthroplasty of the left hip.

Surgery was performed under spinal anesthesia in the lateral decubitus position through a standard posterolateral incision centered over the greater trochanter. The hip was dislocated and a standard femoral neck cut was made 1 cm superior to the lesser trochanter. At this point, the femur was unable to be mobilized anteriorly due to a robust amount of panniculus circumferentially surrounding the field. In order to increase exposure and mobility, the incision was extended proximally and distally and the gluteus maximus tendon, anterior capsule, reflected head of the rectus, and gluteus minimus origin were released. Despite these efforts, the acetabulum still remained poorly visualized. Decision was then made to convert the procedure from a THA to a bipolar hemiarthroplasty (Figure 1). After implantation, stability and range of motion were deemed to be excellent without impingement.

Postoperatively, the patient did well with physical therapy and was discharged home with services on postoperative day 3. During her initial postoperative visit 2 weeks later, the patient had no complaints of pain and was able to walk several blocks using her walker. Due to her significant improvement in pain, she is now motivated to begin exercise and dieting in order to lose weight.

Discussion

Morbidly obese patients are at increased risk for requiring a total hip arthroplasty and require hip replacement 10 years earlier than their non-obese counterparts [12]. Recent reports have correlated obesity with increased surgical time and total operating room time [11,13]. Conflicting results have been reported on whether obesity increases postoperative complication rates compared to non-obese patients. However, several of these studies that showed no differences in outcome reported on patients with average BMI in the 30’s [7,8]. These authors concluded that there is no evidence to support withholding total hip replacement from obese patients who may potentially benefit from surgery. In fact, obese patients have been shown to do well in postoperative inpatient rehabilitation and gain equal functional improvement compared to non-obese patients [13,14].

Super obesity is defined as a BMI of ≥50. A recent review comparing the outcomes of THA in this population to a matched-control group showed a significantly higher complication rate and hospital length of stay [7]. A retrospective review by Schwarzkopf et al. showed that in patients with BMI between 45 and 70, every incremental 5 unit increase in BMI was associated with a statistically significant increased risk of having an in-hospital or postoperative complication, hospital length of stay, and readmission rate. These findings suggest that the impact of obesity continues to become more significant as patient’s BMI increases even above the standard morbid obesity cutoff [8].

We elected to perform surgery on our patient due to her poor and declining functional status, inability to perform any exercise secondary to hip pain, and relatively low comorbidity profile. A posterolateral incision was used due to its relative simplicity, preservation of the abductor mechanism, and routinely good exposure of the acetabulum through anterior displacement of the proximal femur. The posterolateral approach has also been shown to produce more accurate acetabular component positioning compared to other approaches even amongst high-volume joint surgeons [15]. Intraoperatively, the primary concern was misplacing the acetabular cup due to poor visualization of the bony landmarks and inability to reach the hip joint with standard instruments. Several techniques were employed in order to increase exposure of the operative field and mobilize the femur anteriorly,

which are well described. The major restraints to anterior femoral displacement are the gluteus maximus insertion, anterior capsule, and reflected head of the rectus femoris [16], all of which were released prior to deciding on hemiarthroplasty. Other described techniques include greater trochanteric osteotomy or use of an extensile approach, but these methods are associated with risk of nonunion [16,17] and have not been described for primary hip arthroplasty in morbidly obese patients.

Previous studies show obesity to be a risk factor for cup malpositioning [15,18], which is associated with several complications including dislocation, increased wear, squeaking in ceramic-on-ceramic bearings, and edge-loading in metal-on-metal bearings [18-20]. Morbid obesity is reported to be an independent risk factor for dislocation [21]. Therefore, we predict that a malpositioned acetabular component would have led to early devastating complications in our patient.

A literature search yielded only one similar case of a THA converted to hemiarthroplasty due to severe obesity. The authors reported a case of a patient who underwent bariatric surgery and successfully decreased her BMI from 52 to 33 preoperatively. During the time of surgery, her hip circumference was still persistently high, and an acetabular cup could not be placed due to soft tissue interfering with retractor placement, tissue reflection, and surgical access to the acetabulum. While a lower BMI after bariatric surgery may decrease the medical complications of surgery [22], this may not resolve the issues related to the operative site for orthopedic surgeons [23].

The predicted long-term sequelae of performing a hemiarthroplasty instead of THA is a decreased lifespan of the implant and accelerated acetabular erosion requiring eventual conversion to THA. In one historical study, 37% of 71 patients who received a unipolar hemiarthroplasty followed up at 2 years either needed or had undergone total hip replacement. Of those living independently, 55% required THA because of development of pain [24]. Young age, high activity level, and length of follow-up are the most important factors leading to acetabular erosion [24]. By placing a bipolar prosthesis, the theoretical advantage of shifting movement away from the acetabulum to the internal prosthesis articulation may improve results [25]. In one randomized control trial comparing unipolar versus bipolar prostheses, surgeons found acetabular erosion in 20% of patients in the unipolar group compared to 5% in the bipolar group at latest follow-up, suggesting that bipolar hemiarthroplasty may reduce acetabular erosion [26].

**Conclusion**

In conclusion, it is important to medically and physically optimize a patient prior to total hip replacement surgery. While obesity is not a contraindication for surgery, patients should be advised to lose weight prior to surgery in order to potentially decrease the medical and mechanical complications related to increase BMI. While this may be beneficial in most patients, even significant weight loss from bariatric surgery may not address the large soft tissue envelope around the surgical incision site. Therefore, orthopedic surgeons must thoroughly examine their patients and estimate the amount of soft tissue that lies between the skin and the acetabulum before committing to surgery, and be familiar with the surgical techniques that may help provide adequate exposure to the acetabulum. While a hemiarthroplasty may not be the ideal implant for this patient, the high risks associated with a poorly positioned acetabular component may outweigh the benefits of performing a total hip arthroplasty under suboptimal conditions.

**References**


