Does Obesity Impact the Perioperative Course of Patients with Isolated Diaphyseal Tibia Fractures?

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Purpose: Prior studies have examined the effect of obesity in polytrauma, isolated ankle fractures, and elective orthopaedic procedures. This study aims to examine the impact of obesity on the perioperative course of patients with isolated diaphyseal tibia fractures.

Methods: Adults with isolated diaphyseal tibia fractures (AO/OTA 42) operatively treated at a Level I trauma center from 2007-2012 were retrospectively analyzed. We obtained IRB approval. Patients were divided into 4 groups based upon body mass index (BMI): underweight (BMI <18.5 kg/m^2), normal (BMI 18.5-24.9), overweight (BMI 25-29.9), and obese (BMI >30). Outcome measures include length of stay (LOS), intensive care requirement, surgical time, estimated blood loss (EBL), and number of complications. Complications were classified as major or minor. Major complications are adverse events that require invasive treatment, prolonged hospital stay, or were life- or limb-threatening.

Results: 253 patients with diaphyseal tibia fractures were identified in our institutional trauma database. We excluded polytraumatized patients and those with additional orthopaedic injuries. 151 consecutive patients with isolated diaphyseal tibia fractures treated operatively were included in the study population. 75% had closed fractures and 25% had open fractures. 49 patients (32%) possessed a normal BMI, 51 patients (34%) were overweight, and 48 patients (32%) were obese. Only 3 patients (2%) were underweight. No significant difference existed among groups regarding average age, medical comorbidities, tobacco use, average ISS, AO/OTA fracture classification, number of open fractures, or fixation type. There were 27 complications, 14 major and 13 minor. Significantly more major complications occurred in the obese group ($p<0.05$). 10 of 14 (71%) major complications occurred in the obese group including acute hypoxic respiratory failure (3/14), acute renal failure (1/14), cerebrovascular accident (1/14), decubitus ulcer (1/14), iatrogenic fracture during external fixation (1/14), pneumonia (2/14), and pulmonary embolism (1/14). No major complications occurred in the normal BMI group. Average EBL for the normal, overweight, and obese groups was 134 cm^3 (range, 25-300), 136 cm^3 (range, 20-400), and 157 cm^3 (range, 35-500), respectively. Postoperative intensive care requirement for the normal, overweight, and obese groups averaged 0.1 days (range, 0-2 days), 0.2 days (range, 0-4), and 0.5 days (range, 0-8), respectively. Linear regression analysis reveals a significant relationship between BMI and EBL ($P < 0.05$, $r^2 = 0.03$) and BMI and postoperative intensive care requirement ($P < 0.05$, $r^2 = 0.15$). Trends toward longer LOS and longer operative times existed with increasing BMI, but were not statistically significant.

Conclusion: Obese patients face a complicated, challenging perioperative course. Obese patients sustained serious medical and surgical complications not observed in normal weight individuals. Further research could investigate the impact of obesity on long-term outcomes and hospital costs in patients with diaphyseal tibia fractures.

See pages 99 - 147 for financial disclosure information.