Complications of Hip and Knee Arthroplasty in Patients with Cirrhosis of the Liver

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Introduction: For both patient care and economic reasons, there has been an increasing interest in identifying risk factors for complications and poor outcomes after total hip and knee arthroplasty (THA/TKA). Cirrhosis of the liver, irreversible fibrosis of liver tissue leading to hepatic dysfunction, is a known risk factor for complications following THA and TKA. The available literature on outcomes of THA and TKA in patients with cirrhosis is characterized by lack of a control group, small sample sizes, contradictory results (increased versus no increased risk of complications), and the use of the Child-Pugh classification as a measure of disease severity.

Risk stratification is critical in patients with cirrhosis undergoing THA and TKA. As opposed to the Child-Pugh scoring system, which has limited utility for orthopaedists inexperienced in assessing ascites and encephalopathy, the Model for End Stage Liver Disease (MELD) scoring system, used by the United Network for Organ Sharing, is an easily calculated, validated scoring system for severity of liver disease based on common laboratory values. The purpose of this study was to compare the outcomes following THA and TKA in a large series of patients with cirrhosis of the liver against controls and to use the MELD score as a predictor for risk of perioperative complications.

Methods: Our institutional database was used to identify all patients diagnosed with liver cirrhosis undergoing hip or knee arthroplasty from 2000 - 2012 and controls without cirrhosis, matched by age, gender, procedure and year of surgery. Length of stay (LOS), admission to an intensive care unit (ICU), and discharge disposition (home versus short-term rehabilitation facility) information with respect to the admission associated with the procedure was obtained. The perioperative time period was defined as 90 days from the procedure. Perioperative outcomes included readmission, medical complications (sepsis, pneumonia, urinary tract infection, transfusion, deep venous thrombosis, pulmonary embolus, myocardial infarction, stroke, acute respiratory distress syndrome, acute renal failure, GI hemorrhage), and surgical complications (reoperation, revision, superficial infection, deep infection, dislocation, hematoma, wound dehiscence, intra- and postoperative fractures).

Lifetime outcomes for select surgical complications (superficial infection, deep infection, fracture, reoperation, revision) were evaluated. Mortality rates were compared at the perioperative, one-year, and most recent followup. Continuous variables were statistically compared using T-test and categorical values were compared using Chi-square. Regression analysis was used to determine a threshold MELD score that predicted higher risk of complications among cirrhotics.

Results: One hundred-fifteen patients with cirrhosis undergoing THA or TKA, (60 THA, 55 TKA) were identified and matched to 115 patients without cirrhosis undergoing the same procedure. The patients with cirrhosis had a greater than one day longer length of stay (5.3 vs. 4.2 days; p=0.03), more frequent discharge to a skilled nursing or short term rehabilitation facility compared to discharge home (67, 58% vs. 51, 44%; p=0.02), and perioperative readmission rate (12, 10% vs. 2, 2%; p=0.06). Although more patients in the cirrhosis group were admitted to an ICU during the hospital course following the procedure (2, 2% vs. 0, 0%), the difference was not statistically significant (p=0.16). Compared to matched controls, patients with cirrhosis had statistically significant higher rates of UTI (p<0.01), transfusions (p<0.01), renal failure (p=0.03), hemorrhage (p=0.04), infections (p=0.02), dislocations (p=0.01), revision (p=0.04), readmissions (p<0.01), and death (p<0.01).

A MELD score ≥10 predicted a 2.5 times increased likelihood of any complication (p=0.02) and 3.7 times increased likelihood of death (p<0.01) compared to cirrhotics with a score less than 10.

Discussion: Our study identified a dramatically higher rate of medical, surgical, and overall complications in patients with cirrhosis undergoing elective hip or knee arthroplasty. Cirrhotic patients had a longer length of stay, more frequent discharge to a skilled nursing or short term rehabilitation facility, and perioperative readmission rate. Individually, rates of perioperative UTI, transfusion, ARF, and GI hemorrhage, hip dislocations, overall infection, and revision as well as mortality were all significantly higher in these patients as well.

A major finding of this study is the correlation of the rate of complications with the MELD score for patients with cirrhosis. In our study, a MELD ≥ 10 was associated with an increased likelihood of medical complications (odds ratio = 2.6), surgical complications (odds ratio = 4), and death (odds ratio = 3.7) compared to cirrhotics with MELD 10 should be considered.

Significance: Cirrhotic patients had significantly higher rates of medical complications, surgical complications and mortality compared to controls. MELD-Scores >10 are associated with extremely high rates of complications and alternative treatments
should be considered for these patients.

Acknowledgments:

References:

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