# Effects of Having an Atrial Septal Defect on Post-Operative Outcomes of Total Knee Arthroplasty Patients

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INTRODUCTION:
An atrial septal defect (ASD) is a congenital heart defect in which there is a channel between the atria. This channel can vary in size and may lead to potentially life-threatening complications such as arrhythmias and/or heart failure. The impact of having an ASD on postoperative outcomes of patients undergoing total knee arthroplasty (TKA) is poorly understood. Therefore, our objective was to characterize incidence rates and postoperative outcomes between ASD patients and a control cohort undergoing TKA.
METHODS:
The National Inpatient Sample was queried to identify patients who underwent TKA surgery from the years 2005 – 2012. Patient demographics and incidence rates of patients that had been diagnosed with an ASD were reported from the years 2005 – 2012. Controlling for variables such as age, sex and obesity status, differences in postoperative outcomes in the ASD cohort and a control cohort were compared. Multivariate logistic regression analysis controlling for age, sex and obesity status was performed to determine rates and risks of postoperative complications between the two cohorts.
RESULTS:
A cohort of 559 ASD patients and 559 non-ASD patients were identified. Both cohorts had similar sex (66.4% vs 66.2% female), age (67.70 vs 67.67 years) and obesity (18.2% vs 19.5%) distributions. The average incidence rate of patients who had an ASD from 2005 – 2012 was 2.27 (95%CI: 1.74 – 2.81) per 1,000,000 person years (Figure 1). Incidence rates of ASD patients increased by 28.25% from the years 2005 – 2012. (Figure 1). ASD patients who underwent a TKA procedure had higher rates of overall surgical complications, medical complications, transfusions, acute myocardial infarctions, acute renal failure, pulmonary embolisms, deep vein thrombosis, and cerebrovascular events (all, $p<0.05$) (Table 1). Moreover, ASD was found to be an independent predictor to have increased risk of surgical complications (OR=1.516, 95%CI=1.084 – 2.119, p=0.015), medical complications (OR=1.656, 95%CI=1.299 – 2.111, $p<0.001$), gastrointestinal complications (OR=4.890, 95%CI=3.196 – 7.483, $p<0.001$), transfusions (OR=1.524, 95%CI=1.081 – 2.147, p=0.016), acute myocardial infarction (OR=17.502, 95%CI=2.321 – 131.967, $p<0.001$), acute renal failure (OR=3.090, 95%CI=1.376 – 6.938, p=0.006), pulmonary embolism (OR=9.799, 95%CI=2.272 – 42.271, p=0.002), deep vein thrombosis (OR=4.066, 95%CI=1.141 – 14.487, p=0.031) and cerebrovascular events (OR=18.895, 95%CI=6.840 – 52.194, $p<0.001$) (Table 2).
DISCUSSION AND CONCLUSION: ASD patients who undergo TKA experienced higher rates of post-operative surgical complications, medical complications, transfusions, acute myocardial infarctions, acute renal failure, pulmonary embolism, deep vein thrombosis and cerebrovascular events. These findings should be taken into consideration to optimize these patients prior to TKA surgery.