Effect of Ventricular Septal Defect on Postoperative Outcomes of Total Knee Arthroplasty Patients

Jared Newman, Elver Shei-Wah Ho, Ryan Kong, FAISAL ELALI, Benjamin Krasnyanskiy, Adam J Wolfert[1], Harleen Kaur[2], David H Mai, Aditya V Maheshwari[2], Qais Naziri[3]
[1]SUNY Downstate Health Sciences University, [2]SUNY Downstate Medical Center, [3]SUNY DOWNSTATE MEDICAL CENTER

INTRODUCTION: A ventricular septal defect (VSD) is a congenital heart defect in which there is a channel between the ventricles. They are generally considered non-life-threatening but do have the potential to lead to more severe pathologies such as congestive heart failure. The impact of having a VSD on postoperative outcomes of patients undergoing total knee arthroplasty (TKA) is poorly understood.

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 a VSD were reported from the years 2005 – 2012. Controlling for variables such as age, sex and obesity status, differences in postoperative outcomes in the VSD 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 57 VSD patients and 57 non-VSD patients were identified. Both cohorts had similar sex (64.9% vs 66.7% female), age (63.86 vs 64.54 years) and obesity (14.0% vs 17.5%) distributions. The average incidence rate of patients who had a VSD from 2005 – 2012 was 0.23 (95%CI: 0.17 – 0.29) per 1,000,000 person years (Figure 1). Incidence rates of ASD patients increased by 2.87% from the years 2005 – 2012. (Figure 1). VSD patients who underwent a TKA procedure had higher rates of overall surgical complications (p<0.043) (Table 1). Moreover, VSD was found to be an independent predictor to have increased risk of surgical complications (OR=4.304, 95%CI=1.132 – 16.370, p=0.032) (Table 2).

DISCUSSION AND CONCLUSION: VSD patients who undergo TKA experienced higher rates of post-operative surgical complications. These findings should be taken into consideration to optimize these patients prior to TKA surgery.

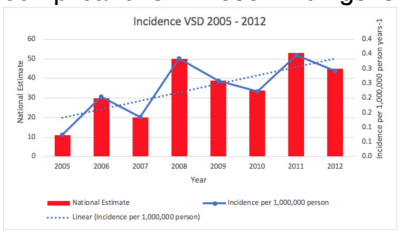

Figure 1: Incidence Rate of Ventricular Septal Defect Patients Undergoing Total Knee Arthroplasty From Years 2005 – 2012.

Postoperative Outcome	Control N (%)	VSD N (%)	P -Value
Surgical Complications	3 (5.3%)	11 (19.3%)	0.043
Wound	0 (0.0%)	1 (1.8%)	1.000
Malunion of Fracture	-	-	-
Nonunion of Fracture	-	-	-
Prosthetic Implant joint	-	-	-
Transfusion of Blood	3 (5.3%)	10 (17.5%)	0.074
Medical Complications	2 (3.5%)	3 (5.3%)	1.000
Altered Mental Status	-	-	-
Acute Myocardial Infarction	-	-	-
Pulmonary	-	-	-
Pneumonia	-	-	-
Gastrointestinal	-	-	-
Urinary Tract Infection	-	-	-
Acute Renal Failure	0 (0.0%)	2 (3.5%)	0.496
Sepsis	-	-	-
Pulmonary Embolism	-	-	-
Deep Venous Thrombosis	0 (0.0%)	1 (1.8%)	1.000
Cerebrovascular Event	-	-	-
Revisions	-	-	-
Mortality (Hospitalization)	0 (0.0%)	1 (1.8%)	1.000

Table 1: Impact of Ventricular Septal Defect on Rate of Postoperative Outcomes on Undergoing Total Knee Arthroplasty.

Postoperative Outcomes	OR [95%CI] (Univariate)	P-Value	OR [95%CI] (Multivariate)	P-Value
Surgical Complications	4.3 [1.1 – 16.4]	0.032	4.5 [1.2 – 17.4]	0.028
Wound	-	-	-	-
Malunion of Fracture	-	-	-	-
Nonunion of Fracture	-	-	-	-
Prosthetic Implant joint	-	-	-	-
Transfusion of Blood	3.8 [1.0 – 14.7]	0.051	4.0 [1.0 – 15.5]	0.046
Medical Complications	1.5 [0.2 – 9.5]	0.650	1.4 [0.2 – 9.1]	0.707
Altered Mental Status	-	-	-	-
Acute Myocardial Infarction	-	-	-	-
Pulmonary	-	-	-	-
Pneumonia	-	-	-	-
Gastrointestinal	-	-	-	-
Urinary Tract Infection	-	-	-	-
Acute Renal Failure	-	-	-	-
Sepsis	-	-	-	-
Pulmonary Embolism	-	-	-	-
Deep Venous Thrombosis	-	-	-	-
Cerebrovascular Event	-	-	-	-
Revisions	-	-	-	-
Mortality (Hospitalization)	-	-	-	-

Table 2: Impact of Ventricular Septal Defect on Rate of Postoperative Outcomes on Undergoing Total Knee Arthroplasty.