

401. Predictors of Treatment Failure for Hip and Knee Prosthetic Joint Infections in the Setting of Prosthesis Removal: A Multi-Center Retrospective Cohort

Christopher Kandel, MD¹; Richard Jenkinson, MD, MSc¹; Nick Daneman, MD, MSc¹; David Backstein, MD¹; Matthew P. Muller, MD, FRCPC, PhD²; Kevin Katz, MD, MSc, FRCPC³; Abhilash Sajja, MBBS¹; Felipe Garcia Jeldes, MD⁴ and Allison McGeer, MD¹; ¹University of Toronto, Toronto, ON, Canada; ²St. Michael's Hospital, Toronto, ON, Canada; ³North York General Hospital, Toronto, ON, Canada; ⁴CHU de Québec – Université Laval, Laval, QC, Canada

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Background. Prosthetic hip and knee joint infections (PJIs) are challenging to eradicate despite prosthesis removal and long courses of antibiotics. We aimed to describe the risk factors for PJI treatment failure in a multicenter retrospective cohort.

Methods. A retrospective cohort of individuals who underwent prosthetic joint removal for a PJI at one of five hospitals in Toronto, Ontario, Canada from 2010–2014. Individuals eligible for the cohort were obtained by searching operative listings and PJIs were defined according to the criteria of the Musculoskeletal Infection Society. Treatment failure was defined as recurrent PJI, amputation, death or chronic antibiotic suppression. Potential risk factors for treatment failure were abstracted by chart review and assessed using a Cox proportional hazards model.

Results. 533 PJIs were analyzed over a median follow-up duration of 1102 days with 21 surgeons performing more than 5 revision arthroplasties for a PJI. Two-stage procedures were performed in 81% (430/533) and the most common organism was coagulase negative staphylococci (32%). Treatment failure occurred in 28% (150/533) over 1443 patient-years and was caused by a different bacterial species in 53% (56/105). On multivariate analysis the characteristics associated with PJI treatment failure included liver disease (adjusted hazard ratio (aHR) 3.12, 95% confidence interval (95% CI) 2.09–4.66), the presence of a sinus tract (aHR 1.53, 94% CI (1.12–2.10), preceding debridement with prosthesis retention (aHR 1.68, 95% CI 1.13–2.51), a one-stage procedure (aHR 1.72, 95% CI (1.28–2.32), and infection due to Gram-negative bacilli (aHR 1.35, 95% CI 1.04–1.76).

Conclusion. PJI treatment failure remains high despite prosthesis removal and the patient risk factors identified are non-modifiable. Novel treatment paradigms are urgently needed along with efforts to reduce orthopedic surgical site infections.

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402. Clinical Characteristics and Outcome of *Staphylococcus lugdunensis* Prosthetic Joint Infections

Komal Masood, MD¹; Joan Duggan, MD, FACP, AAHIVS¹; Roberta Redfern, PhD²; Gregory Georgiadis, MD³ and Geehan Suleyman, MD¹; ¹University of Toledo Medical Center, Toledo, Ohio; ²Promedica Health System, Toledo, Ohio; ³ProMedica Health System, Toledo, Ohio

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Background. Although *Staphylococcus lugdunensis* is a coagulase-negative staphylococcus, it shares similar characteristics with *S. aureus* and is increasingly recognized as the cause of serious infections, including prosthetic joint infections (PJIs). The aim of this study was to determine the clinical characteristics and outcome of *S. lugdunensis* PJIs.

Methods. This was a retrospective multicenter study conducted from January 2007 through December 2017 involving consecutive adult patients with *S. lugdunensis* PJIs in northwest Ohio. Clinical and microbiologic characteristics, treatment modalities and outcome were evaluated.

Results. A total of 695 patients were evaluated and 29 (4%) patients met inclusion criteria (Table 1). All patients were Caucasian and 52% were female with a median age 68.8. Comorbidities included Diabetes Mellitus (34%), CAD (41%), CHF (20%), COPD (20%) and cancer (14%). The most common clinical presentations were pain (28/29, 97%), decreased range of motion (27/29, 93%) and joint swelling (21/29, 72%). Two patients had concomitant bacteremia. Knee was the most commonly affected joint (69%), followed by hip (24%). All isolates, except one, were susceptible to oxacillin. Thirteen (45%) patients had a two-stage revision, nine (31%) debridement with/without revision, six (21%) no surgical intervention and one (3%) a 1-stage revision. The majority of patients (71%) received ≥4 weeks of antibiotics (abx). Two patients with no surgical intervention and one with debridement received no abx. Another was discharged to hospice without intervention. Relapse was observed in two (15%) patients who had a 2-stage revision, four (44%) who had debridement, 6 (100%) who had no surgical intervention or 1-stage revision. Overall, there was a statistically significant difference in cure rates in patients who underwent 2-stage revision compared with other treatment modalities ($P = 0.003$) regardless of abx treatment regimen, including prolonged IV abx therapy. However, IV abx were superior to oral ($P = 0.009$).

Conclusion. Appropriate management of *S. lugdunensis* PJIs includes both aggressive surgical management with a prolonged course of abx with excellent clinical responses. Relapse is high in patients treated without two-stage revision irrespective of route or duration of abx therapy.

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403. Clinical Features and Treatment Outcome of Enterobacter Prosthetic Joint Infections

Dima Youssef, MD¹; Babak Hooshmand, MD² and Ashish Bhargava, MD³;

¹Ascension St. John Hospital, Grosse Pointe, Michigan; ²Ascension Health, Saint John Hospital and Medical Center, Grosse Pointe Woods, Michigan; ³Ascension St John, Grosse Pointe Woods, Michigan

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Background. Enterobacter prosthetic joint infections (PJIs) are rare, occurring mainly in elderly people usually with complex medical and surgical history, and their treatment is usually challenging. Aim of this study is to assess the characteristics and outcomes of Enterobacter PJIs.

Methods. A retrospective multi-centric cohort was studied at three hospitals from January 2012 to December 2018. Patients with PJIs were identified using ICD codes. Enterobacter PJIs were then identified through reviewing patients' electronic medical records.

Results. 13 enterobacter PJIs were identified. 9 (69%) were polymicrobial. Mean age of the patients was 61.7 years, and mean BMI was 34.6 kg/m². 8 patients (62%) were females, and 8 patients (62%) were Caucasians. Infected sites were: Hip in 5 patients (38%), knee in 5 patients (38%) and ankle in 3 patients (23%) patients. 9 patients (69%) had osteoarthritis, 3 patients (23%) had diabetes mellitus, and 1 patient (8%) had connective tissue diseases requiring steroids. Most patients (11 out of 13) (85%) presented within 1 week of symptoms onset. Presenting clinical features were pain in 9 patients (69%), drainage in 10 patients (77%), purulence in 7 patients (54%), and fever in 5 patients (38%). 11 patients (85%) were managed with debridement, antibiotics and implant retention (DAIR), and 2 patients (15%) with antibiotics alone. Antibiotics used while managing were as follows: Cefepime $n = 6$, quinolones $n = 2$, carbapenems $n = 4$ and aminoglycosides $n = 1$. Outcome: 4 patients (31%) developed deep surgical site infections (and two of them required implant removal), 5 patients had no events in 12 months of follow-up, 3 patients (23%) had less than 6 months of follow-up, and one patient died in the hospital due to cardiac failure.

Conclusion. In our study, most cases of Enterobacter PJIs were polymicrobial. The success rate in monomicrobial infections was 75% while overall it was noted to be 38%. DAIR was associated with high readmission rates and deep surgical site infections (36%). 18% cases managed with DAIR required implant removal.

Outcome of Enterobacter PJIs:

Treatment	Number of Patients	12 months follow up
DAIR	1	Deep surgical site infection requiring implant removal
	1	No events
One Stage Revision	1	No events
Two Stage Revision	1	No events

Treatment	Number of Patients	12 months follow up
DAIR	3	Deep surgical site infection: 1 patient required implant removal and 2 patients required chronic antibiotics suppression
	5	No events
	2	Had <3 months follow up
	1	Died inpatient from cardiac failure

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404. miRNA-Gene Pairs Associated with Shock and Renal Failure in Filipino Septic Patients

Christian Deo T. Deguit, MSc¹; Manuel D. Yoro, MD²; Jude Erric Cinco, MD³; Maria Sonia Salamat, MD⁴; Joseph Adrian Buensalido, MD⁴; Catherine Silao, MD, PhD⁵; Marissa M. Alejandria, MD, MSc¹ and Jose Nevado, Jr., MD, PhD⁵; ¹University of the Philippines Manila, National Institutes of Health, Manila, National Capital Region, Philippines; ²College of Medicine, University of the Philippines – Manila, Manila, National Capital Region, Philippines; ³The Medical City, Pasig, National Capital Region, Philippines; ⁴Philippine General Hospital, Manila, National Capital Region, Philippines; ⁵UP-National Institutes of Health, Manila, National Capital Region, Philippines

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Background. Small non-coding microRNAs (miRNAs) are increasingly recognized as key regulators of the host response to sepsis. However, the molecular mechanisms implicated in the role of miRNAs during sepsis progression is still unclear. It is hypothesized that differentially expressed genes in septic patients with worse outcomes are associated with dysregulation of miRNA expression. This study aimed to identify specific miRNA-gene pairs that may be implicated in the development of shock and renal failure in sepsis.