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

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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 prosthesis 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 surgeries 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% (561/1056) of patients. 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 degenerative disease 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

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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 treatment 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 24-weeks of antibiotics (abs). Two patients with surgical intervention and one with debridement received no abs (Ana005). Abs 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 went 2-stage revision compared to those with other treatment modalities (P = 0.003) regardless of abs treatment regimen, including prolonged IV abs therapy; However, IV abs were superior to oral (P = 0.009).

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

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

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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%). 9 patients (90%) 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: Ceftazidime n = 6, quinolones n = 2, carbapenems n = 4 and aminglycylides 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 in management of 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                  | No events           |
| One Stage Revision | 1     | No events           |
| Two Stage Revision | 1    | No events           |

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

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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.

Figure 1: Heatmap of differentially expressed miRNA-gene pairs between shock and no shock groups.

Table 1: List of differentially expressed miRNA-gene pairs between shock and no shock groups.

| MiRNA Gene Pair | P-value |
|-----------------|---------|
| miR-155-5p - CCL2 | 0.009 |

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