308. Identification of Prosthetic Hip and Knee Joint Infections in Administrative Databases
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Background. Canada lacks a prosthetic hip and knee joint infection (PJI) registry, leaving active surveillance to be orchestrated by individual hospitals, which is limited by cost and narrow scope. Administrative databases are potentially an ideal instrument for infection surveillance, but detection algorithms relying solely on PJI diagnostic codes alone have been hampered by low specificity. There is a need to develop improved strategies to efficiently and accurately identify PJIs using health administrative databases.

Methods. Combinations of International Classification of Disease, Tenth Revision, diagnostic and procedure codes were used to create testing cohorts among individuals treated at two institutions in Toronto, Ontario, from April 1, 2015 until March 31, 2016. These cohorts were compared with a reference standard of PJIs, which were identified by chart reviews of every individual who underwent a hip or knee revision operation at these institutions during the study period. The primary outcomes were the performance characteristics of each algorithm.

Results. Over the 1-year study period, there were 471 revision operations for 405 patients, of which 155 (33%) were performed for the treatment of a PJI. Of the 405 individuals, 108 (27%) had a PJI as the surgical indication; there were 57 (53%) two-patient cases. Of these, 155 (33%) were performed for the treatment of a PJI. Of the 405 revision operations at these institutions during the study period. The primary outcomes were continuous variables.

Conclusion. The combination of a revision operation procedure code and a PJI diagnosis code is sensitive and specific for the detection of a PJI in administrative databases. This is a promising avenue for national PJI surveillance and has the potential to facilitate future research in the prevention and management of PJIs.

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309. The Infected Spacer: The Impact of Spacer Exchanges and Debridements on Two-Stage Exchange Arthroplasty Outcomes
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Background. Prosthetic joint infection (PJI) is a grave complication of total joint arthroplasty (TJA). Data on patients who require further surgery for infection between spacer insertion and reimplantation (i.e., while the spacer is in place) are limited. We investigated the effect of spacer exchange or irrigation and debridement (I&D) on clinical outcomes in patients undergoing two-stage exchange for PJI.

Methods. A retrospective cohort of hip and knee PJI treated with two-stage exchange was identified by query of hospital coding records from 2009 to 2014, with subsequent chart review. All cases met Musculoskeletal Infection Society International Consensus criteria for PJI. The primary endpoint was defined as prosthesis retention for 2 years from reimplantation. Spacer intervention was defined as undergoing a spacer exchange or I&D for infection purposes prior to reimplantation. Descriptive statistics were completed using the Fisher’s exact test for categorical variables and the Mann–Whitney U test for continuous variables.

Results. Three hundred patients undergoing two-stage exchange for TJA PJI were identified (141 hips and 159 knees). The average age was 66 years and 42% were female. Forty-two patients (14%) underwent spacer intervention, 22 knees (14%), and 20 hips (14%). 34 of these underwent spacer exchange. Of the 42 patients with spacer intervention, 28 (67%) met the primary endpoint. In univariate analysis, there was an association between spacer intervention and outcome (P = 0.02). Comorbidities and sex, BMI, and age were not associated with outcome. The association appeared more pronounced among the TKJ subgroup. Patients who underwent spacer intervention were 2.1 (CI: 1.1–4.4) more likely to fail than TKA patients who did not require such an intervention (P = 0.02).

Conclusion. We present 2-year outcomes on a large cohort of TJA PJI treated with two-stage exchange arthroplasty. Patients requiring spacer exchange or I&D after TJA explantation have worse outcomes than their counterparts who do not. Because patients who fail two-stage exchange arthroplasties often proceed to arthrodesis or amputation, our findings may help guide clinical decision-making prior to reimplantation.

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310. Assessment of MSIS Diagnostic Criteria as Predictors of Treatment Success in Total Knee Arthroplasty (TKA) Infections Treated With Two-Stage Exchange
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Background. Prosthetic joint infection (PJI) is a grave complication of total knee arthroplasty (TKA); predicting outcome is difficult. Musculoskeletal Infection Society (MSIS) criteria can predict the outcome of infected TKR PJI treated with two-stage exchange arthroplasty (TKA). Data on patients who require further surgery for infection between spacer insertion and reimplantation (i.e., while the spacer is in place) are limited. We investigated the effect of spacer exchange or irrigation and debridement (I&D) on clinical outcomes in patients undergoing two-stage exchange for PJI.

Methods. A retrospective cohort of hip and knee PJI treated with two-stage exchange was identified by query of hospital coding records from 2009 to 2014, with subsequent chart review. All cases met Musculoskeletal Infection Society International Consensus criteria for PJI. The primary endpoint was defined as prosthesis retention for 2 years from reimplantation. Spacer intervention was defined as undergoing a spacer exchange or I&D for infection purposes prior to reimplantation. Descriptive statistics were completed using the Fisher’s exact test for categorical variables and the Mann–Whitney U test for continuous variables.

Results. Three hundred patients undergoing two-stage exchange for TJA PJI were identified (141 hips and 159 knees). The average age was 66 years and 42% were female. Forty-two patients (14%) underwent spacer intervention, 22 knees (14%), and 20 hips (14%). 34 of these underwent spacer exchange. Of the 42 patients with spacer intervention, 28 (67%) met the primary endpoint. In univariate analysis, there was an association between spacer intervention and outcome (P = 0.02). Comorbidities and sex, BMI, and age were not associated with outcome. The association appeared more pronounced among the TKJ subgroup. Patients who underwent spacer intervention were 2.1 (CI: 1.1–4.4) more likely to fail than TKA patients who did not require such an intervention (P = 0.02).

Conclusion. We present 2-year outcomes on a large cohort of TJA PJI treated with two-stage exchange arthroplasty. Patients requiring spacer exchange or I&D after TJA explantation have worse outcomes than their counterparts who do not. Because patients who fail two-stage exchange arthroplasties often proceed to arthrodesis or amputation, our findings may help guide clinical decision-making prior to reimplantation.

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Results. 159 patients who underwent 2-stage exchange for TKA PJI meeting MSIS criteria were identified. 116 patients (73%) remained infection-free after two years of observation. Neither of the major criteria [presence of sinus drainage (P = 0.6); >1 positive culture (P = 1.0)], nor any of the minor criteria (individually or in composite) reached statistically significant association with treatment outcome.

Conclusion. Individual MSIS diagnostic criteria, which have prognostic utility in TKA PJI treated with DAIR, are not powerful predictors of outcome of TKA PJI after two-stage exchange.

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311. Low Rate of Microbiologic Relapse in Two-Stage Exchange for Knee Prosthetic Joint Infections
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Background. Prosthetic joint infection (PJI) is a grave complication of total knee arthroplasty (TKA). Historically, two-stage arthroplasty exchange has been considered to be the definitive approach to eradicating infection and preserving joint function. However, patients are increasingly presenting with higher rates of comorbidities traditionally associated with poorer orthopedic surgical outcome, including advanced age, obesity and diabetes. We investigated whether two-stage exchange remains effective for TKA PJI in this population, and evaluated the microbiology of repeat infections.

Methods. A retrospective cohort of TKA PJI treated with two-stage exchange was identified by query of hospital coding records from 2009 to 2014, with subsequent chart review. The primary endpoint was defined as prosthesis retention for 2 years from reimplantation. Microbiologic relapse was defined as a recurrence of a previously treated organism. Descriptive statistics were completed using the Fisher's exact test for categorical variables and the Mann–Whitney U test for continuous variables.

Results. One hundred fifty-nine patients who underwent two-stage exchange for a TKA PJI meeting Musculoskeletal Infection Society International Consensus criteria were identified. The average age was 66 years, and 37% were female. One hundred forty-one underwent reimplantation; 24 of these (17%) had recurrent infection. Of the 24 patients who developed infection after reimplantation, only four reimplanted with the same microbe; the other 20 (83%) were diagnosed with new, microbiologically distinct organisms. Three of these four recurrences were due to Staphylococcus aureus infection. The likelihood of microbiologic relapse was low among reimplanted patients (3%). In univariate analysis, no associations were found between outcome and age, comorbidities, or BMI.

Conclusion. Two-stage exchange arthroplasty for TKA infection is associated with a very low rate of microbiologic relapse, and those patients able to undergo reimplantation remain at risk of subsequent infections with new microbes. It remains important to continue to modify risk factors in patients who have undergone a two-stage exchange for PJI.

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312. Comparison of Short Course and Long Course of Antibiotics in Patients With Osteomyelitis: A Systemic Review and Meta-analysis
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Background. Current guidelines for treatment of osteomyelitis (OM) suggest antibiotics for 3–6 weeks. However, recent studies provided conflicting evidence about the benefits of the prolonged use of antibiotics. We conducted a systemic review and meta-analysis to assess the outcomes of short- and long-term antibiotics in patients with OM.

Methods. We used three queries to retrieve literature of vertebral OM, chronic OM, and diabetic foot OM from PubMed and Embase databases until December 2017. Each query comprised medical subject headings, title/abstract keywords, and exclusion terms. Two reviewers independently screened literature for three rounds and disagreements were resolved by a third reviewer. Quality of a cohort study and that of a randomized control trial (RCT) were assessed by Newcastle-Ottawa Quality Assessment Form and a modified Jadad scale, respectively.

Results. A total of 7,192 studies were retrieved (Figure 1). Eleven observational studies, only five were graded as good or fair quality. Thirteen studies demonstrated no significant difference in outcomes between short- and long-term of antibiotics, while three studies showed favorable outcomes in patients taking long-term antibiotics. The aggregate odds ratio (OR) of mortality was 0.46 (95% CI, 0.21, 0.92) for observational studies and 0.90 (95% CI, 0.58, 1.41) for RCTs, showing no significant benefits of long-term antibiotics in patients with OM (Figure 2). In patients with vertebral OM, outcomes were comparable between short- and long-term of antibiotics (OR 0.51, 95% CI, 0.26, 1.01). In seven studies where only intravenous (IV) antibiotics were used, there was no significant benefit of long-term antibiotics (OR 1.12, 95% CI, 0.68, 1.83). However, in the remaining nine studies where antibiotics were transitioned from IV to oral form, there was marginal benefit of long-term oral antibiotics (OR 0.44, 95% CI, 0.22, 0.91).

Conclusion. Both RCTs and observational studies demonstrated that long-term antibiotics use did not generate significantly better outcome as compared with short-term antibiotics in patients with all-cause or a specific type of OM.

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