

203. Assessment of a Modified Antibiotic Prophylaxis Open Fracture Protocol

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Background. National guidelines support antibiotic prophylaxis for open fracture with cefazolin +/- aminoglycoside based on fracture grade and contamination. The purpose of this study was to assess a modified adult antibiotic prophylaxis open fracture protocol (AOFPP) which recommended weight-based cefazolin for low-grade fractures or ciprofloxacin plus vancomycin for high-grade fractures.

Methods. Adult patients with open fractures admitted to Palmetto Health Richland between January 2012 and December 2016 were screened for study inclusion. Exclusion criteria were receipt of antibiotics for reasons other than open fracture, death prior to wound closure, and local admission time >48 hours after time of injury. Compliance to all elements of AOFPP was assessed. Clinical endpoints including open fracture infection rates, epidemiology, and drug-related adverse events were compared between pre-implementation (January 2012 – December 2012) and post-implementation period (November 2015 – December 2016). χ^2 and *t*-tests as appropriate were used to compare outcomes between groups.

Results. Following exclusions 189 patients were included in the analysis (90 pre- vs. 99 post-AOFPP, respectively). Post-AOFPP, a 17% (16/93) adherence rate to all AOFPP elements was found. Appropriate agents were selected in 82.8% (77/93). The most common reasons for non-adherence were incorrect dosing and prolonged antibiotic duration. Fracture site infection rates were 23.3% (21/90) and 7.1% (7/99) in pre- and post-AOFPP groups, respectively (*P* = 0.001). Infections primary caused by Gram-negative pathogens in pre-AOFPP and Gram-negative organisms comprised 62 and 40% of open fracture site infections in pre- and post-AOFPP groups, respectively. Incidence of acute kidney injury, *Clostridium difficile*-associated diarrhea, and other antibiotic-associated AEs were rare and comparable between groups. Change in median days to infection (55.6 days vs. 56.55 days, *P* = 0.71) and median duration of antibiotics in hours (48.0 vs. 54.7, *P* = 0.59) was not significantly different post implementation.

Conclusion. Local adherence to all elements of the modified AOFPP was low, yet the appropriate agent(s) was used in majority of cases. The modified AOFPP was associated with a numerical decrease in infection rates post-open fracture and comparable AEs.

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204. Pubic Osteomyelitis: Epidemiology and Factors Associated with Management Failure in Two French Reference Centers

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Background. Pubic osteomyelitis (PO) is a neglected bone and joint infections (BJI), as its management is still poorly codified. We aim to describe PO epidemiology and to look for factors associated with management failure.

Methods. We performed a retrospective cohort study in two French reference centers including patients with PO in 2010–2016. Treatment failure was defined by clinical (persistence or recurrence of clinical signs) and/or microbiological failure. Factors associated with treatment failure were determined by *univariate Cox analysis (hazard ratio [HR] and 95% confidence interval calculation)*. Kaplan–Meier curve was compared between groups by log-rank test.

Results. Twenty-five patients were included over 13 years (median age 67 years; 19 men, median ASA score 3). Six (24 %) had a PO from haematogenous origin. Those were all monomicrobial infection, due to *S.aureus*, mostly identified in young patients without comorbidities, especially in athletes. No surgery was required if no abscess or bone sequestrum were found. Nineteen patients (76 %) had a post-operative chronic PO (developed from 1 month to 11 years after a pelvic surgery); 15 of them had history of pelvic cancer (60%); 12 received radiotherapy at the site of infection (48 %). Infection was polymicrobial in 68 % of cases, including 32 % of cases with multidrug-resistant pathogens. A clinical success was recorded in only 14 patients (56%). Treatment failure was always noticed in chronic post-operative forms. Potential risk factors associated with failure management were: pelvic cancer history (HR 3.8; *P* = 0,089); pelvic radiotherapy history (HR 2.9; *P* = 0.122); clinical sinus tract (HR 5.1; *P* = 0,011); infection with multidrug-resistant bacteria (HR 2.8; *P* = 0,116), and polymicrobial infection (HR 70.5; *P* = 0,090).

Conclusion. Our study highlights predominant chronic complex post-operative forms of PO. They are mostly plurimicrobial, sometimes associated with multi-drug

resistance, occurring in fragile patients with pelvic cancer. It frequently leads to complex antibiotherapy, with important risk of relapse. Aggressive surgical procedure with large bone resection is frequently required in patients who underwent pelvic radiotherapy.

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205. Reexamining BSA as a Preoperative Predictor of Risk of Prosthetic Joint Infection

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Background. Prosthetic joint infection (PJI), a dreaded complication of arthroplasty, has been found to correlate with increasing body mass index (BMI) and body surface area (BSA). Recent data suggest that BSA may be a better predictive tool for assessing infection risk. We further evaluated this association in an orthopedic specialty hospital arthroplasty cohort to evaluate whether BSA is a predictor of prosthetic joint infection.

Methods. A retrospective cohort of hip and knee arthroplasty patients between 2009 and 2014 was identified through administrative hospital data using ICD-9 codes. Patients with a BMI <14 or >60 kg/m², height <142 or >200 cm, and weight <36 or >226 kg were excluded. BSA was calculated using the DuBois formula, and assessed both as a continuous and as a categorical variable. Univariate analyses were done using χ^2 tests and adjusted models were assessed using logistic regression.

Results. 17,859 knee and 18,128 hip patients were identified. 1.1% of knees and 0.74% of hips were infected. Mean BSA was 1.9 m² (\pm 0.2 m²). BSA was significantly associated with PJI in hips (*P* = 0.004), but not knees, when analyzed as a continuous variable in unadjusted models. However, this association lost its significance after adjusting for PJI risk factors. Additionally, when assessed as a categorical variable in a multivariate model, BSA in the highest quartile (>2.11) was not associated with PJI.

Conclusion. After evaluating BSA as a continuous and categorical variable, we failed to find an association between BSA and infection risk in THA or TKA. The impact of BSA decreased after multivariate adjustment. BSA may not be optimal as a predictor of preoperative risk.

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206. Variability in Management of Acute Osteoarticular Infections at a Children's Hospital and Favorable Outcomes with Increasing Early Transition to Oral Therapy

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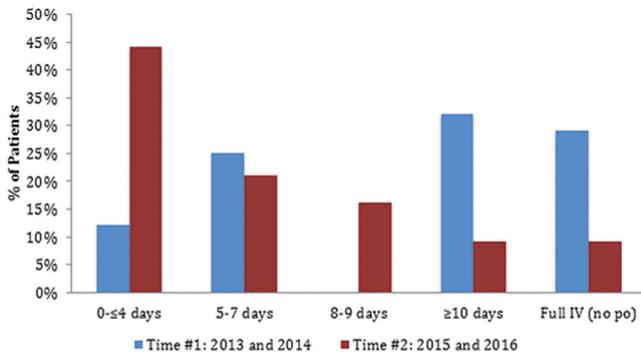
Background. To date, there is no established guideline for the treatment of acute pediatric osteoarticular infections (OAI), and considerable variability in management exists amongst providers and across institutions. This study analyzed the recent management and clinical outcomes of OAI at a children's hospital.

Methods. Patients admitted with acute osteomyelitis and septic arthritis [OAI] aged 2 months to 18 years at the Women & Children's Hospital of Buffalo, between 1/1/2013 and 12/31/2016, were identified via billing databases. Patients with select comorbidities or >2 positive blood cultures were excluded. Patient demographics, antibiotics used, culture results, time from intravenous (IV) to oral (PO) therapy, length of hospitalization (LOH), PICC (peripherally inserted central catheter) line use, and emergency room (ER) visits and readmissions within 6 months of discharge, were collected and analyzed. The study period was divided into 2-year groups, before and after 1/1/15, a juncture when a new provider began to promote early transition to oral therapy (through ID consults and informal discussion).

Results. Thirty-one patients were admitted during Time#1 (2013–14) and 43 during Time#2 (2015–16). Time to PO therapy was widely distributed (Figure 1) throughout the 4 years, with 65% of patients in Time#2 transitioned \leq 7 days, vs. 37% in Time#1 (*P* = 0.02). Specifically for osteomyelitis, mean time to PO decreased from Time#1 to #2 from 11.5 to 8.3 days. Sixty-one percent of patients in Time#1 vs 25% in Time#2 (*P* < 0.01) received a PICC line, and PICC use was associated with 1.5 day greater LOH (*P* = 0.02). There was no relationship between time to PO and repeat ER visit/readmission. Nearly 30% of patients in Time#1 had PICC or OAI-related ER visits/readmissions after discharge, while 0% did for Time#2 (*P* < 0.01).

Conclusion. Length of initial IV therapy and PICC line use continues to vary significantly for pediatric acute OAI. In our children's hospital, a shift towards earlier transition to PO therapy has been adopted steadily – and prior to national and planned local guidelines – with a general decrease in LOH, duration of IV therapy, PICC line issues following discharge, and overall improved outcomes. Pediatric OAI management represents an ideal focus for institutional quality and antibiotic stewardship efforts.

Figure 1: Time to Oral Therapy



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207. Septic Arthritis due to Oral Streptococcal Species Following Intra-articular Injection: A Case Series and Retrospective Chart Review

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Background. Oral streptococcal species are a rare cause of septic arthritis. We hypothesized that one possible source of infection is oral bacteria from the mouth of a practitioner performing joint injection without a mask. While the use of a face mask is standard practice during lumbar puncture and other spinal procedures due to the risk of iatrogenic meningitis, mask usage during joint injection is not a standard recommendation.

Methods. The clinical microbiology laboratory database was reviewed to identify joint fluid cultures positive for oral streptococcal bacteria between January 2007 and December 2015. The corresponding patient charts were reviewed for evidence of joint injection within 90 days prior to the positive culture.

Results. We identified 18 cases of septic arthritis due to oral streptococcal species. Of those joint injection was performed prior to the development of acute septic arthritis in four (22%) cases. The implicated pathogen was *Streptococcus mitis/oralis* in two cases, *Streptococcus sanguinis* in one case, and *Abiotrophia defectiva* in one case. All four cases occurred in males over the age of 60 and affected native joints. Three of four patients had underlying osteoarthritis, and three of four had a history of diabetes. The patients all presented with acute worsening of joint pain and swelling 2-5 days after undergoing joint injection. Three cases followed corticosteroid injection and 1 followed an MRI arthrogram. All four patients underwent at least one surgical procedure (two required repeat irrigation and debridement) to treat the infection and received at least 4 weeks of antibiotic therapy.

Conclusion. Oral streptococcal species should be considered in the differential of causative species of septic arthritis in patients presenting with worsening pain after a joint injection. The use of a face mask during joint injection should be explored as a simple and inexpensive precaution to prevent this rare but serious complication.

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208. Clinical Comparison between Native Vertebral Osteomyelitis with Abscess vs Without Abscess in Clinical Features and Outcomes

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Background. It is well documented that native vertebral osteomyelitis (NVO) is accompanied by abscess formation (epidural, paravertebral, and psoas muscle) that is complicated by neurological deficit. There are few studies comparing between NVO with abscess and NVO without abscess in clinical features and outcomes.

Methods. We conducted a retrospective cohort study at St. Luke's Intl. Hosp. in Tokyo, Japan (acute care hospital, 520 beds) from 2004 to 2015. Diagnosis of acute NVO was made by clinical signs and symptoms, and MRI. Clinical features and outcomes of NVO patients with abscess were compared with ones without abscess. Fisher's exact test, Mann-Whitney U-test, and Kaplan-Meier curve with log-rank test were used in univariate analysis and the association to length of stay was analyzed by Cox-regression model controlling confounding.

Results. Among 122 patients with NVO, 83 patients (68%) had abscess (group A) and 39 patients (32%) had no abscess (group B). Median age: (group A: 69 vs. group B: 66, $P = 0.641$). Median length of stay (LOS) in hosp: (A: 48 vs. B: 43 days, $P = 0.007$) (Table 1). Group A had higher rate of neurological symptoms (16.9 vs. 2.6%, $P = 0.035$), blood cultures positivity (62.7 vs. 35.9%, $P = 0.007$), infective endocarditis (IE) (15.7 vs. 2.6%, $P = 0.036$), and longer duration of therapy (75 vs. 56 days, $P = 0.025$) than group B in univariate analysis. Also, group A had trend toward higher rate of methicillin-susceptible *S. aureus* (28.9 vs. 5.1%, $P = 0.056$). Kaplan-Meier analysis revealed LOS was significantly longer in group A ($P = 0.013$) (Figure 1). The result of Cox's proportional hazards model suggested abscess was associated with longer LOS (Table 2). Blood culture positivity was independently associated with longer LOS. No statistically significant associations were observed between abscess and 90-day mortality (5.1 vs. 3.6%, $P = 0.654$), or neurological sequelae (6 vs. 0%, $P = 0.227$).

Conclusion. LOS of NVO patients with abscess was longer than those without abscess. In particular, LOS was significantly longer in patients with positive blood culture than those with negative results.

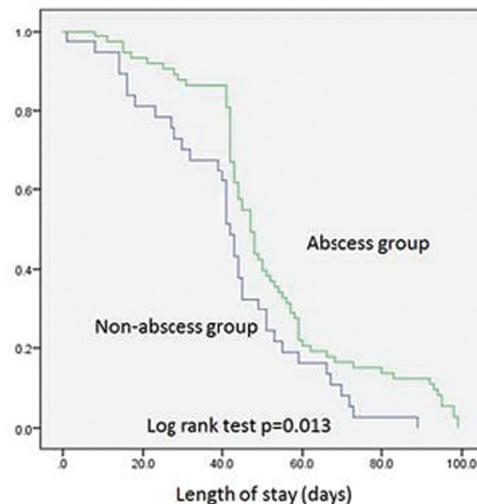
Table 1. Comparison of clinical outcomes in abscess and non-abscess group

| | Abscess (-) (N=39) | Abscess (+) (N=83) | Overall (N=122) | p value |
|---|--------------------|--------------------|-----------------|---------|
| Surgical intervention, n (%) | 0 (0) | 15 (18.1) | 15 (12.3) | 0.003 |
| LOS, median [IQR] | 43 (29-54) | 48 (42-64) | 47 (41-66.3) | 0.007 |
| Length of treatment (IV), median [IQR] | 42 (28-42) | 42 (42-49) | 42 (42-48) | 0.008 |
| Length of treatment (PO), median [IQR] | 19 (3.5-44) | 30 (10.5-61) | 23 (5.3-55.3) | 0.322 |
| Length of treatment (Total), median [IQR] | 56 (45-84) | 75 (56-114.5) | 66 (50.5-104) | 0.025 |
| Complication, n (%) | 0 (0) | 5 (6) | 5 (4.1) | 0.227 |
| 1-year recurrence, n (%) | 1 (2.6) | 4 (4.8) | 5 (4.1) | 0.774 |
| F/U (years), median [IQR] | 2 (1-7.35) | 2.4 (1-5.7) | 2.29 (1.08-6.1) | 0.692 |
| 30-day mortality, n (%) | 0 (0) | 0 (0) | 0 (0) | N/A |
| 90-day mortality, n (%) | 2 (5.1) | 3 (3.6) | 5 (4.1) | 0.654 |

Table 2. Multivariate analysis for length of stay

| | Crude HR | 95%CI | p value | Adjusted HR | 95%CI | p value |
|------------------------|----------|-------------|---------|-------------|-------------|---------|
| Abscess | 1.652 | 0.404-0.914 | 0.017 | 1.935 | 0.468-1.084 | 0.113 |
| Blood culture positive | 1.584 | 0.397-0.854 | 0.006 | 1.628 | 0.403-0.889 | 0.011 |

Figure 1. Comparison of length of stay in abscess and non-abscess group



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209. Time-to-Report of the Bone Culture and Microbiologic Adequacy of Empiric Antibiotics in Patient's with Diabetic Foot Osteomyelitis

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