SH2: Is there a role for prolonged peri-operative antibiotics to prevent acute post-operative PJI?

Liaison: Benjamin Zmistowski
Lead delegate: Emilie Cheung
Supportive delegates: Benjamin Clark; Usama Saleh

Response: The available data does not support routine use of prolonged antibiotics during primary or revision surgery; however, there may be a role in high-risk cases.

Strength of Recommendation: Limited

Delegate Vote: 50 (100%) agree; 0 disagree; 0 abstain

Rationale: A comprehensive literature review was performed to identify all studies on use of prolonged per-operative antibiotics in shoulder arthroplasty. Searches for the keyword terms "prolonged antibiotic shoulder arthroplasty" (22, 30), "extended antibiotic shoulder arthroplasty" (10, 18), "antibiotic prophylaxis shoulder arthroplasty infection" (40, 93), were performed using the search engines PubMed and Scopus which were searched through January 2025. Inclusion criteria for our systematic review were all English studies (Level I-IV evidence) that reported on use of prolonged or extended antibiotic prophylaxis in primary or revision shoulder arthroplasty. Exclusion criteria were non-English language articles, nonhuman studies, retracted papers, case reports, review papers, studies with less than <10 patients in the sample size, studies without clinical follow-up/infection rates, and technique papers without patient data. PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) criteria were followed. We identified zero articles from PubMed and zero articles from Scopus that met all criteria. Given the limited number of articles identified with the search terms used, searches were separately performed to identify studies on prolonged peri-antibiotic outside of the shoulder literature

There is no data in the shoulder literature specific to the use of extended antibiotic prophylaxis (EAP) in primary arthroplasty. Because of this, expert recommendations will have to be inferred from data from hip and knee arthroplasty. Based on a review of this literature, there appear to be advantages to the utilization of EAP of PJI in high-risk patients. Studies have shown a significant decrease in infection rates in high-risk patients who receive extended oral antibiotic prophylaxis(1,2). The rationale for EAP is to counteract poor host factors and provide additional protection against infection or until intraoperative cultures are negative[1]. The utility of EAP in aseptic revision arthroplasty is not well-studied, and no universally accepted protocol exists. There are also concerns regarding the potential for increased antimicrobial resistance with extended antibiotic use.

Author	SurgeryType	Patient Population	Antibiotic Prophylaxis	Outcome	Results
Aseptic Revision THA					
Kuo(3)	Retrospective	Aseptic revision THA	Standard (≤24 hours) vs Extended (>24 hours)	PJI within 1 year	No significant difference in PJI rates. **Extended prophylaxis did not provide additional benefit**.
Bukowski(4)	Retrospective	Aseptic revision THA	Standard vs Extended	Any infection, PJI, re-revision, reoperation for infection at 90	No statistically significant difference in risk of infection, PJI, re-

				days, 1 year and 5 years	revision, or reoperation. **Trend toward protective effect of extended prophylaxis**.
Villa(5)	Retrospective	Aseptic revision THA and TKA	Standard vs Extended	PJI rates	**No significant difference in PJI rates**.
Primary Arthroplasty					
Inabathula(2)	Retrospective	Primary TJA (THA and TKA) with risk factors	Standard vs Extended	PJI within 90 days	High-risk patients who did not receive extended oral antibiotic prophylaxis were 4 to 5 times more likely to develop PJI.
Kheir(6)	Retrospective	Primary TJA (THA and TKA) with risk factors	Standard vs Extended	PJI within 90 days	**Extended antibiotic prophylaxis reduced 90-day infection rates** in high-risk patients.
Kheir(1)	Retrospective	Primary TJA	Standard vs Extended	PJI within 1 year	**Extended antibiotic prophylaxis reduced 1-year infection rates in high-risk patients**, and infection rates in the extended group were less than low-risk patients. **Number needed to treat was 57 patients**.
Carender(7)	Retrospective	Morbidly obese patients (BMI ≥40 kg/m^2) undergoing primary TJA	Standard vs Extended	Wound complications and PJI within 90 days	**No significant difference in wound complications or PJI rates**.
Bundschuh(8)	Retrospective	Primary and Aseptic Revision TJA	Standard vs Extended	PJI within 3 months	Patients receiving EOA were **less likely to develop PJI**following primary and aseptic revision TJA.

Flynn(9)	Retrospective	Primary THA and TKA	Standard vs Extended	PJI within 90 days and 1 year	**No significant difference in PJI rates at 90 days and 1 year.** No difference in high risk patients.
All TJA (Primary and Revision)					
Dasari(10)	Meta-analysis	All TJA	Standard vs Extended	PJI rates	**EAP led to a significant decrease in the probability of developing PJI**.

The role of EAP in total joint arthroplasty remains an area of ongoing debate. While some studies suggest benefits, particularly in high-risk patients undergoing primary TJA, other studies do not show significant benefit, especially after revision procedures. The results are highly variable depending on patient population and methodology. The potential for adverse effects, the lack of consistent evidence, and varying methods suggests that widespread adoption of EAP cannot be universally recommended. There is a need for large, randomized, multi-center trials to define which patients might benefit from extended prophylaxis and which regimen would be most beneficial, as well as longer-term follow-up to determine if early benefit lasts. There is also a continued need for effective strategies for minimizing surgical site contamination and the identification of better antibiotics to combat PJI.

References:

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