

Does Pre-Operative Doxycycline Reduce *Propionibacterium Acnes* in Shoulder  
Arthroplasty?  
NCT03115177  
5/16/2018

### Study Design and Patients

This study was reviewed and approved by the Institutional Review Board (IRB) and registered on clinicaltrials.gov protocol number 15052002. Patients undergoing primary total anatomic (TSA) or reverse shoulder arthroplasty (RTSA) were screened for eligibility. Inclusion criteria included patients diagnosed with primary osteoarthritis, rotator cuff arthropathy, or post-traumatic arthritis indicated for a total or reverse shoulder arthroplasty. Patients who had a recent corticosteroid injection were also included; this information however was not documented or recorded. Exclusion criteria included patients with any prior arthroscopic or open shoulder surgery to the affected side, patients with a known history of infection or recent antibiotic use within 90 days, and patients with a known allergy to doxycycline or penicillin.

### Randomization

After informed consent, patients were randomized in a one to one ratio into either the control group or the treatment group. All patients received standard perioperative antibiotics with weight-based cefazolin (2g for under 120kg, 3g for over 120kg) within 1 hour of incision and continued for 24 hours postoperatively. The control group did not receive any further antibiotic treatment. The treatment group received 100mg of doxycycline IV in addition to cefazolin prior to incision. Randomization was performed pre-operatively using opaque envelopes selected at the time of enrollment and consent. As only outcomes of the study were culture positivity from cultures obtained at the time of surgery, we did not include a placebo and the surgeon and patient were not blinded to the treatment.

### Surgical Procedure

Patients underwent a standard TSA or RTSA. All patients underwent a standard skin preparation with both alcohol and chlorhexidine (Chloraprep (Becton, Dickinson, and Company, Franklin Lakes, NJ)). The patients did not have any other pre-admission skin cleaning or scrub. Surgical draping included the use of Ioban in all cases. The axilla is not routinely shaved at our institution. In the treatment group, doxycycline was infused starting ninety minutes prior to skin incision. This infusion was given over one hour to prevent thrombophlebitis as per the recommendations of our pharmacist. Once the doxycycline infusion was complete, the line was then flushed with normal saline, and cefazolin was infused over thirty minutes prior to skin incision. In the control group, the cefazolin was infused over thirty minutes prior to skin incision.

During the procedure, aerobic and anaerobic cultures were taken. These culture included (1) an excisional tissue biopsy of the skin edge, (2) a tissue swab of the superficial dermal tissue within the incision, and (3) a tissue swab of the glenohumeral joint. The first culture was taken immediately after incision and was an excision of the skin edge that was approximately 1 cm in length and 3 mm in width from the medial edge at the middle of the incision. The second culture was taken immediately after incision by taking a swab of the superficial dermal tissue within the incision. The third culture was taken after the joint was entered by takedown of the subscapularis by taking a swab of the glenohumeral joint of the humeral head surface. Each of these cultures were incubated for fourteen days for both aerobic and anaerobic culture to allow for *P. acnes* detection. We followed our

standard surgical protocol, using a separate knife and instrumentation for superficial dissection and deep dissection.