

## EXPERT OPINION

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### **Propionibacterium acnes colonization of the human shoulder**

Patel A; Calfee RP, Green A et al  
J Shoulder Elbow Surg (2009) 18: 897- 902

### **Propionibacterium acnes infection after shoulder arthroplasty: A diagnostic challenge**

Dodson CC, Craig Ev, Warren RF et al  
J Shoulder Elbow Surg (2010) 19: 303 – 307

The above articles have revealed the increased consideration for the pathogen *Propionibacterium acnes* as a cause for infection post shoulder surgery, especially in shoulder arthroplasties. *P acnes* is a gram-positive anaerobic bacillus that is closely associated with sebum-rich hair follicles.

The paper by Patel A et al successfully proved that *P acnes* colonized the skin around the shoulder in greater numbers than the knee or hip. They evaluated shoulder surgical sites such as the anterior and posterior acromion as well as the anterior axillary fold. Male patients were also found to have a higher rate of colonization of *P acnes* than compared to women. The reason for this the researchers claimed was the increased presence of hair and perspiration in men than compared to women. It is important to note that the *P acnes* organism is difficult to culture and this is due in part to the organism's ability to reside intracellularly and remain dormant for weeks. Anaerobic tissue culture and prolonged incubation (up to 14days) are required to isolate the organism. The study also revealed that the level of *Staphylococcus* colonization at the shoulder regions tested was just as high as those of *P acnes*. It is therefore important for the surgeon performing shoulder procedures to consider these factors when deciding on his prophylactic antibiotic regime.

In the second article related to this organism the authors retrospectively evaluated 11 cases of *P acnes* infected shoulder arthroplasties to try and determine its clinical presentation and to propose treatment options. Group I had five patients that were diagnosed with infection clinically on the basis of wound erythema or drainage, positive cultures, or the presence of a fluid collection. Group II had six patients who were treated for prosthetic or soft tissue related dysfunction without any suspicion of an underlying infection. An infection was then "incidentally" diagnosed intra operatively. Confirmation of infection in both groups were made by means of frozen section intra operatively. The organism was then confirmed by culture samples and only at an average of 9 days of incubation. When they evaluated the sensitivity and resistance of these cultures they found it to be resistant to metronidazole but sensitive to penicillin and clindamycin. The authors came to 4 valuable recommendations to prevent and manage these type of cases:

- Isolate the axilla by means of an adhesive antimicrobial drape (Ioban™; 3M) before any skin incisions are made.

- All culture specimens from potential surgical site infections or infected prosthesis components are incubated for a minimum of 10 days.
- All patients undergoing revision shoulder surgery are informed beforehand that intra operative findings, such as a positive frozen section (indicating possible infection) can alter the planned treatment intra operatively. This is especially applicable in cases where infection is not suspected.
- Surgeons should have a very high index of suspicion for infectious disease in all patients with a painful shoulder prosthesis.

Being aware of *P acnes* role in causing infections related to shoulder surgery will assist in the successful prevention and treatment of these difficult cases. It is important to take note also that standard techniques of culturing specimens will not isolate the *P Acnes* organism. Surgeons should therefore discuss these cases with their microbiologist, to ensure that correct culturing techniques are used.