

COMMERCIALLY PURE DISSOLVABLE ANTIBIOTIC BEADS: A CLINICAL REVIEW OF 756 CASES OF PERI-PROSTHETIC JOINT INFECTION AND ASEPTIC REVISION ARTHROPLASTY

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Aim

Dissolvable antibiotic-loaded calcium sulphate beads have been utilized for management of periprosthetic joint infection (PJI) and for aseptic revision arthroplasty. However, wound drainage and toxic reactive synovitis have been substantial problems in prior studies. Currently a commercially pure, physiologic product has been introduced that may reduce complications associated with this treatment modality. We aim to answer the question: does a commercially pure, physiologic version of antibiotic-loaded calcium sulfate beads reduce wound drainage and provide efficacious treatment for PJI and aseptic revision arthroplasty?

Method

Starting January 2010, 756 consecutive procedures were performed utilizing a set protocol of Vancomycin and Tobramycin antibiotics in commercially pure dissolvable antibiotic beads. There were 8 designated study groups:

Aseptic Revision TKA	N = 216	Aseptic Revision THA	N = 185
DECRA* TKA	N = 44	DECRA* THA	N = 16
1 st Stage Resection TKA	N = 103	1 st Stage Resection THA	N = 62
Reimplant TKA	N = 81	Reimplant THA	N = 49

*DECRA = Debridement, modular Exchange, Component Retention, iv Antibiotics for acute PJI

Results

Wound drainage in the entire series was 4.2%. Wound drainage was generally seen in cases using higher bead volumes (≥ 30 cc). The rate of heterotopic ossification was 1.6%. With bead volumes of ≥ 30 cc, we did notice transient hypercalcemia in 12% of the study group (14% hips, 10% knees). The overall rate of infection failure was 2.5%. In the DECRA groups, reinfection failure rate was encouraging, measuring 9.1% in knees and 6.3% in hips. The non-DECRA group with the highest infection rate was Reimplant TKA (6.2%).

Conclusions

We utilized a large series of commercially pure dissolvable antibiotic-loaded beads in a wide variety of clinical scenarios in patients with substantial comorbidities. Our rate of wound drainage, compared to prior studies utilizing gypsum products, was reasonably good. Additionally, our

infection failure rates were encouraging. Over-stuffing knee joints with too many beads, in our clinical review, does affect wound drainage rates. By removing impurities from calcium sulfate, we do not see the substantial toxic synovial reaction compared to the traditional gypsum-washed products. We feel that commercially pure, physiologic antibiotic-loaded dissolvable beads are an acceptable delivery tool for local antibiotic delivery in aseptic and septic revision joint arthroplasty of the hip and knee. In our opinion, further study is warranted. We advocate future randomized studies to examine the potential of improving outcomes of PJI and aseptic revision arthroplasty.