Comparing Early Outcomes of Antibacterial-coated vs Uncoated Endoprostheses: A Single Institution's Experience with Quaternary Ammonium Technology

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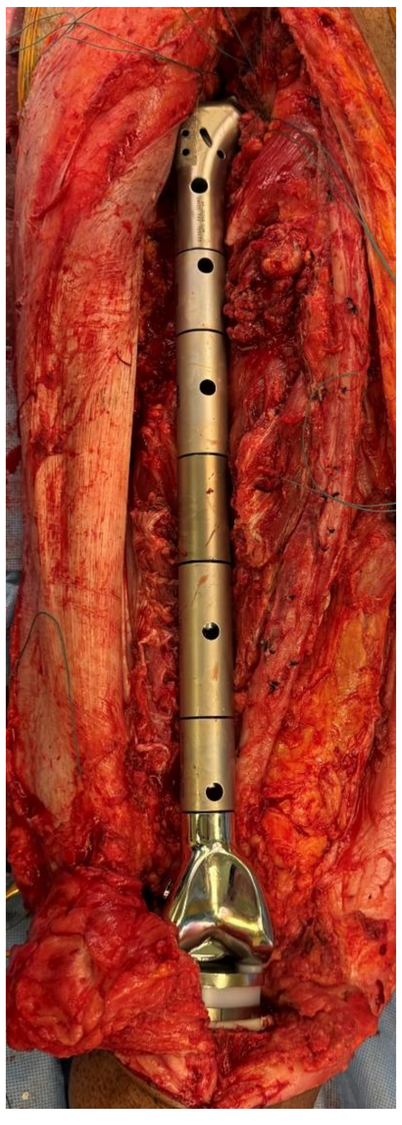
BACKGROUND

- Periprosthetic infection remains a significant source of morbidity in endoprosthesis reconstruction
- Quaternary ammonium coating [NanoCept; Onkos Surgical, Parsippany, NJ] was FDA approved on 12/19/2024
- Purpose: compare early clinical outcomes between quaternary ammonium-coated (QAC) and uncoated lower extremity endoprostheses
- Hypothesis: QAC implants would demonstrate lower rates of infection and revision

METHODS

- A retrospective cohort study was performed between December 2022 and October 2025
- Reconstructions included:
  - Total Femur Replacement (TFR)
  - Proximal Femur Replacement (PFR)
  - Distal Femur Replacement (DFR)
  - Proximal Tibia Replacement (PTR)
- Stratified based on the use of QAC vs uncoated implants
- Primary outcomes included periprosthetic infection and repeat surgery
- Secondary outcomes included wound complications and implant survivorship
- For QAC implants, the percentage of the implant's surface area was coated was calculated

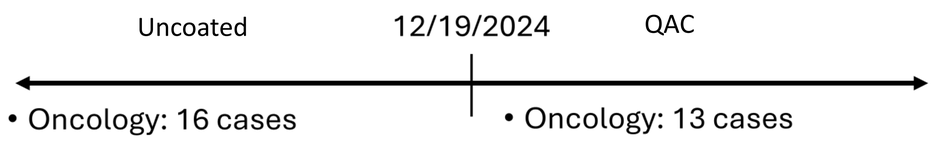


DISCUSSION

- For primary oncology indications, there were no infections with QAC use
- Decreased utilization of chronic suppressive antibiotics
- Class B hosts and Class C tissue
- Limitations: early results, limited sample size

RESULTS

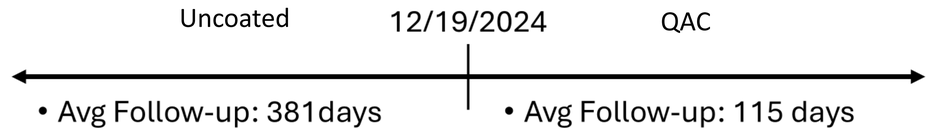
Comparison of Indications



- Oncology: 16 cases
  - Primary Sarcoma: 10 cases
  - Metastatic: 6 cases
- Revision Arthroplasty: 9 cases
- Primary Arthroplasty: 2 cases

- Oncology: 13 cases
  - Primary Sarcoma: 8 cases
  - Metastatic: 4 cases
  - Benign: 1 case
- Revision Arthroplasty: 12 cases

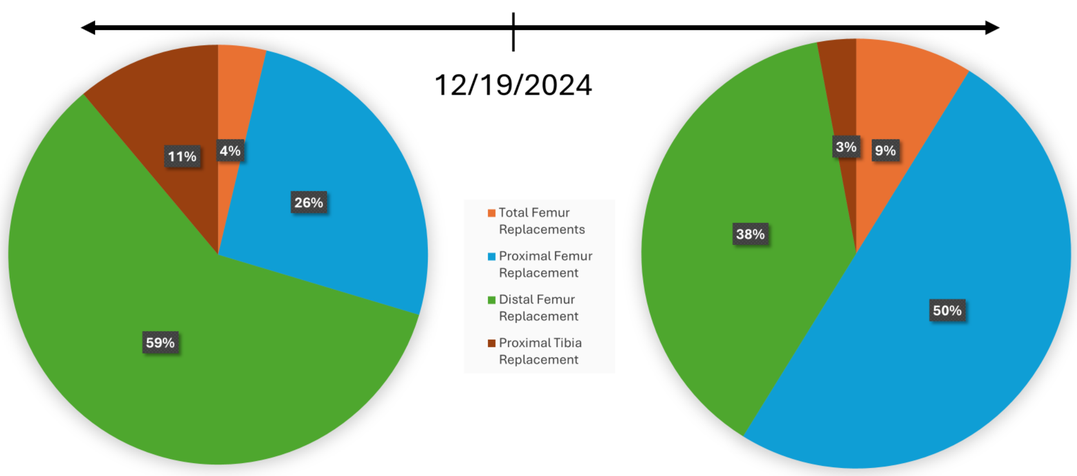
Comparison of Results



- Avg Follow-up: 381days
- Avg Recon: 123.7 mm
- Infections:
  - Acute: 1 DAIR plus, resolved
  - Chronic: 7 on suppression abx

- Avg Follow-up: 115 days
- Avg Recon: 197.12 mm
- Infections:
  - Acute: 1 DAIR plus, resolved
  - Chronic: 2 on suppressive abx
  - AKA: 1

Comparison of Reconstructions



Reconstructions:

- Average length of reconstruction: 197mm (Range: 111-505mm)
- Average length of NanoCept coating: 82.8mm (Range: 40-260mm)
- Percentage length of NanoCept coating: 39% (Range: 22-77%)
- Percentage surface area of NanoCept coating: 17% (Range: 7-38%)

Highlighted cases of QAC reconstruction with long-term infection:

- Green Circle: Chronic Suppressive Antibiotics
  - 61F underwent TFR for chronically infected THA and DFR
- Blue Circle: Chronic Suppressive Antibiotics
  - 64F underwent TFR for chronically infected DFR with bone loss
- Red Circle: Above Knee Amputation
  - 65M underwent revision DFR for chronically infected DFR and failed soft tissue coverage