

# Iodine-Loaded Implants in Prevention and Treatment of Surgical Site Infections for Compromised Hosts

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## INTRODUCTION:

Surgical site infection is a common complication following orthopaedic implantations for compromised host. Silver-coated implants were introduced in order to reduce implant-related infection. Meanwhile, we developed iodine coating for titanium implants and conducted prospective clinical research. We have reported the results of the progress so far, but in this study we will report the final results.

**METHODS:** This study was approved by the institutional review board at our university. Between July 2008 and July 2017, a total of 653 patients with postoperative infection or compromised status were treated using iodine-loaded titanium implants. The mean age of the patients was 48.6 years (range, 4-90 years). The mean follow-up period was 41.7 months. Three-hundred-seventy-seven patients were male and 276 were female. In 477 patients, iodine-supported implants were used to prevent infection, such as compromised status, and in 176 patients to treat active infection (one-stage: 89 patients, two-stage: 87 patients). In the limbs and pelvis, the primary diagnoses included 161 cases of tumor, deformity / shortening in 92, pseudarthrosis in 47, fracture in 42, infected TKA in 32, osteoarthritis in 25, pyogenic arthritis in 21, infected THA in 20, and osteomyelitis in six. In the spine cases, there were 136 cases of tumor, 36 cases of pyogenic spondylitis, and 35 cases of degeneration.

## RESULTS:

The total number of infected cases was 6.9% in 45 cases. Infection rate of limb osteomyelitis was highest at 50%, followed by purulent spondylitis 16.7%, infected TKA 15.6%, extremity/pelvic tumor 11.8%, spinal degeneration 5.7%, infected THA 5.0%, pyogenic arthritis 4.8%, pseudarthrosis 4.3%, osteoarthritis 4.0%, spinal tumors 3.7%, deformity / shortening and fractures 0%. The mean time to onset of infection was 9.8 months. The total infection rate of cases used for prophylactic purposes was 3.8%, and many infections were caused by tumor diseases (limb/pelvic tumor 8%, spinal tumor 4%). The total infection rate of cases aimed at treating infection was 15.3%, and there was no difference between one-stage replacement (14.6%) and two-stage (16.1%). Osteomyelitis of the extremities was highest at 75% followed by limb/pelvic tumors 34.8%, purulent spondylitis 16.7%, and infected TKA 15.6%. However, although there were 11 cases of treatment for postoperative spinal tumor infection, the reinfection rate was 0% using iodine-coated instrument in all cases.

## DISCUSSION AND CONCLUSION:

Because the infection rate of iodine-coated implants used for compromised hosts is low, postoperative infection can be controlled. It is considered to be highly effective for spinal infection cases that require one-stage revision surgery.

