Risk Factors for Periprosthetic Infection Following Endoprosthetic Replacement for Bone Tumours

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Background: Deep periprosthetic infection remains one of the most difficult and challenging complications to treat after endoprosthetic replacement with reported periprosthetic infection rates of 5-13% in most of the previously published large series. A significant number of patients will ultimately require an amputation for uncontrollable infection.

Purposes: To identify the patient- and treatment-related factors associated with increased risk of periprosthetic infection after endoprosthetic reconstruction.

Patients and Methods: One hundred and seventy high risk patients with a mean age of 42.2 (range, 18.4 to 90.4) years were included in this study. There were fifty primary reconstructions (29.4%), seventy nine one-stage revisions (46.5%) and forty one two-stage revision surgeries (24.1%). The impact of different factors on periprosthetic infection was examined.

Results: All patients were followed up for a minimum of 12 months. The most significant risk factors for infection were location of the prosthesis (pelvis and proximal tibia = 27%, other sites 13%, p=0.02), followed by the operative time (≥135 minutes = 19%, <135 minutes = 6%, p=0.046). The indication for surgery was relevant, with primary procedures of the pelvis or proximal tibia having the highest infection rates. Factors not found to be significant in this small series were: radiotherapy, chemotherapy, preoperative hemoglobin, smoking, diabetes, comorbidities, and obesity. Patients who received blood transfusion had a higher risk of infection (24% vs 14%, p=0.9).

	Pelvis/Proximal Tibia	Other sites	Statistical Significance
Primary	10/32 (31%)	1/18 (6%)	p = 0.03
One stage revision	0/8	6/71 (8%)	NS
Two stage revision	4/12 (33%)	8/29 (28%)	NS

Infection rates in patients at highest risk (two-stage revisions or location proximal tibia/pelvis) were halved in patients with a silver coated prosthesis (22%) compared to a non-silver coated implant (38%).

Conclusions: In this highly selected group, anatomical location and duration of surgery were the two biggest risk factors for infection. Further elaboration of risk factors for infection in larger series will allow assessments of interventions to reduce this.