Risk factors of infection after total knee arthroplasty

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Introduction
Total knee arthroplasty (TKA) has been proven to be the most effective treatment for patients with severe or “end-stage” joint disease. Although infection is not a frequent complication of total knee arthroplasty, it is certainly one of the most dreaded. Treatment of the infected patient may require long hospitalization, many weeks of intravenous antibiotic therapy, and multiple surgical procedures. The purpose of this study was to identify related factors associated with septic arthritis.

Materials and Methods
2202 primary total knee arthroplasties were done in 1257 patients at the authors’ institution between 1995 and 2006. Of these knee arthroplasties, 222 knees in 1257 patients were available for followup. Revision arthroplasty procedures and infected knees were excluded. All of the arthroplasties were performed under the supervision of a senior attending surgeon. The surgical site was washed with antimicrobial soap and shaved the night before surgery and then washed again immediately before the surgical incision. Intravenous prophylactic antibiotics were administered within 30 minutes of the surgical incision. The operative suits were equipped with vertical laminar flow units. Surgical drains were routinely used. All of the prostheses were of Flexible Nichidia Knee (FNK), with a metal femoral component, a metal tibial component and a polyethylene insert. The medical records were reviewed to extract the following information: age, gender, body mass index, preoperative CRP, preoperative ESR, preoperative TP, duration of surgery, operative blood loss, total blood loss, duration of surgical drain, duration of antibiotic prophylaxis, primary diagnoses, smoking, diabetes mellitus, steroid or DMARDs therapy, previous operation around the knee joint, previous arthroscopic surgery, previous operation without arthroscopic surgery, previous operation of high tibial osteotomy (HTO) or open reduction internal fixation (ORIF), residue of internal fixation material, bone graft, patella replacement, and bone cement. Date was analyzed using SPSS software. Proportions were compared using the chi-square or two-tailed Fisher’s exact test, as appropriate. Continuous variables were compared by the Student’s t-test. All p values were two-tailed, and a p value of ≤0.05 or less was considered to be statistically significant.

Stepwise logistic regression analysis indicated that the four predictors of infection following total knee arthroplasty were gender (odds ratio [OR], 0.2; 95% confidence interval [CI95], 0.1 to 0.6; P=0.005), previous operation of ORIF (OR, 7.9; CI95, 1.1 to 57.1; P=0.041), residue of internal fixation material (OR, 26.0; CI95, 4.5 to 151.0; P<0.001), body mass index (OR, 1.2; CI95, 1.0 to 1.3; P=0.007) (Table 2).

Discussion
Deep periarticular infection is one of the most feared complications in orthopaedic surgery. Although advances in surgical technique and prosthesis design, improvements in operating room ventilation, and the use of preoperative prophylactic antibiotics have all contributed to a decline in the incidence of infection following arthroplasty procedures, infections still occur with potentially devastating results. The current infection rate is reported to be 1% to 2% for primary TKAs. At the authors’ institution infection rate is 0.8% for primary TKAs. Many authors have already identified several patient characteristics associated with an increased risk of infection after total knee arthroplasty. These characteristics include rheumatoid arthritis, prior open surgical procedures, immunosuppressive therapy, poor nutrition, hypokalemia, diabetes mellitus, obesity, smoking, duration of surgery, use of surgical drains, and skin ulcer. In this study, we tried to confirm the importance of these characteristics and to identify other potential related risk factors. We were able to identify other comorbidities not yet associated with total knee arthroplasty infection. These comorbidities included previous operation of ORIF, and residue of internal fixation material.

References