**Original Article**

The Combination of Systemic Antibiotics and Antibiotics Impregnated Cement in Primary Total Knee Arthroplasty in Patients of Rheumatoid Arthritis - Evaluation of 60 Knees

**Background.** We evaluated the effect of combination of systemic antibiotics and antibiotics-impregnated cement in prevention of deep infection in primary total knee arthroplasty (TKA) in patients of rheumatoid arthritis (RA).

**Methods.** Between 1993-2000, primary TKA were performed for 60 RA patients. Systemic antibiotics with cefazolin and gentamycin were applied in all the patients. Cefuroxime-impregnated cement was used for fixation of tibial and patellar components in all the patients; femoral component was fixed noncementedly in 45 patients (hybrid TKA) and cementedly in 15 patients (cemented TKA). The preoperative, intraoperative and postoperative courses were evaluated in detail. The mean follow-up period was 61 months (range: 24-108 months). The effect of cefuroxime-impregnated cement in the prevention of postoperative deep infection in primary TKA in cases of RA was evaluated.

**Results.** Except 1 (1.6%) superficial infection, no other complication was noted. There was no deep infection, either.

**Conclusions.** Cefuroxime-impregnated cement combining with systemic antibiotics seems to be effective in the prevention of early or intermediate deep infection in primary TKA in patients of RA.

**METHODS**

From 1993 to 2000, 60 consecutive procedures for primary TKA for RA were collected in this study. Patients with diabetes mellitus, prior knee surgery, any kind of lower extremity infection, osteomyelitis or malignant tumor were excluded. All the operations were done via midline incision. The parapatellar approach was used in 30 patients and midvastus approach was used in 30 patients. The type of prostheses...
used was Duracon (Homedica, Ireland) pros the ses in 45 pa tients and Nexgen (Zimmer, Wa saw) in the other 15. Cefuroxime-impregnated ce ment (2 gram cefuroxime in 40 gram Sim plex P ce ment by Homedica) was used for fixaton of tibial and patellar components in all the pa -
tients, and, fem o ral com po nent was fixed noncementedly in 45 patients (hy brid TKA) and cementedly in 15 pa-
tients (ce mented TKA). All pro ce dures were per formed by the same author (FY Chiu). The mean age was 58
years (range: 32-72 years). There were 10 males and 40 fe males, with 10 bi lat er al knees. There were 35 left knees
and 25 right knees.

Each patient had intravenous bolus in jec tions of
cefazolin (500 mg) and gentamicin (80 mg) before the
operation, and intravenous in jec tions of cefazolin 500
mg ev ery 6 hours and gentamicin 80 mg ev ery 12 hours
were given for 36 hours after the op er a tion. Then, oral
anti bi otics with cefazolin 500 mg ev ery 6 hours was
given for 7 days. Drain tube (free drain age) was used for
36 hours and removed in the 2nd postoperative day.
From post op er a tive day 1 to the day of dis charge, con ti-
nu ous passive mo tion (CPM) was used. Postope r ative,
patients were main tained at bedrest for the first post op er -
a tive day with range of mo tion, CPM and quadriceps ex-
cercises be ing pre scribed im me di ate ly. Weight bearing of
the op er ated knee was al lowed im me di ate ly after the op -
er a tion, and crutches was used as needed. The mean
(range) of hos pi tal stay was 8 (5-16) days. The op er a tive
course and post oper a tive courses were re corded in de tail.

The first post op er a tive fol low-up was per formed at 3
weeks, the sec ond fol low-up was per formed at 8 weeks,
and the third fol low-up was per formed at 6 months. There -
after, fol low-up was per formed at 6-month in ter vals. The
mean fol low-up was 61 months (24-108 months). Ra di-
ographic evaluations were performed on every follow-up
visit, and a func tional eval u a tion was per formed start ing
with the third post oper a tive visit util izing the Hos pi tal for
Spe cial Sur gery score. The in fec tions were clas si fied ac-
cord ing to the sys tem as de scribed by McQueen et al.18

RESULTS

The tour ni quet time was 33 (23-45) min utes. The op-
eration time was 57 (45-75) minutes. The amount of
blood trans fu sion was 4 (2-8) units of packed RBC. The
preoperative /postoperative HSS knee score was 46
(25-61)/90 (65-96).

There was 1 (1.6%) early superficial wound in fec -
tion which was cured by man age ment with wound
debridement and in tra ve nous an ti bi otics for 1 week and
oral antibiotics for another 1 week. No deep infection
was noted till the fi nal fol low up. No other com pli ca-
tion de vel oped in this se ries. Ex cept the case with loos en ing,
all the other cases were rated as good or excel lent in
func tion al re sults.

DISCUSSION

Deep in fec tion is one of the most dev as tat ing com-
pli ca tions of to tal knee re place ment and has been cited as
the most common cause of implant fail ure.5,10-21 Many
factors have been im pli cated as con trib ut ing to the oc cur-
rence of in fec tion af ter to tal knee arthroplasty. Some of
these in clude patient factors (local skin con di tion, sys-
temic medi cal con di tion, and prior his tory of op er a tion,
etc.), perioperative factors (op er a tion room con di tion,
ap par a tive course, op er a tion suits, etc.), sur gi cal tech -
nique fac tors (im plant se lec tion, an ti bi otics us age, post -
oper a tive wound care, etc.), and post oper a tive fac tors, et
al.20-31 Each of the fac tors could se ri ously af fect the oc -
cur rence of in fec tion af ter to tal knee arthroplasty.

The weak ness of this ar ti cle is lack of con trol group,
lack of randomiaed com pa ri son and lack of sta tis ti cal
anal y sis, since there were too small cases to con duct a
prospec tive ran dom ized com pa ri son study. How ever,
we could com pare our re sult with the re sults in other se -
ries.

The super fi cial wound in fec tion rate in this se ries
was com pa ra ble with other re ports.20-31 Com pared with
the de vel oped coun tries, our medi cal en vi ron ment is not
so well and our pa tients were op er ated on in poor ster ili-
ized op er a tion rooms (with out UV light, with out lam i nar
flow and with out iso la tion suits). In such perioperative
con di tions, the deep in fec tion rate was zero which is
better than those re ported.20-31 In this study, we used both
cefuroxime-impregnated ce ment and sys tem ic an ti bi
ot-
ics. This strategy seems more effective in preventing early and intermediate deep infection in primary TKA in patients of RA.

An antibiotic-impregnated cement serves as a kind of use of an antibiotic but represents only one of the many factors required in prevention of infection in total knee arthroplasty. In this study, no infection developed in patients who had cefuroxime-impregnated cement in their TKA. A surgeon must perform the total knee arthroplasty with critical attention to every aseptic step and an antibiotic usages age. The main effect of an antibiotic-impregnated cement is to offer a stronger local resistance to infection in the postoperative period via elusion of antibiotics into the joint fluid. To mix cement with antibiotics is a simple adjunctive procedure, which may enhance the resistance of primary to total knee arthroplasty to deep infection, as shown in this series. Many an antibiotic could be impregnated in cement with little adverse effect to the ten sile strength of the cement, but no clinical adverse effect was noted.

The choice of cefuroxime in this series is accord ing to the good results in another study and to the availability in our hospital.

In conclusion, systemic antibiotics in combination with antibiotics (cefuroxime)-impregnated cement may be recommended in primary TKA in patients of RA, especially when the sterile zone is not up to the standard. However, more patients and long-term follow-up are needed for further conclusions.

REFERENCES

23. Bengtson S, Knutson K, Lidgren L. Treat ment of in fection


