

## Post-operative infection in total knee arthroplasty in steroid dependent rheumatoid arthritis

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### Abstract

**Background:** Rheumatoid arthritis (RA) is a chronic autoimmune inflammatory disease which primarily affects and damages synovial joints. Patients with RA will therefore often undergo joint replacement surgery. Patients with rheumatoid arthritis are more prone to infection than patients with osteoarthritis knee because of use of steroids, poor bone quality, and more flexor contracture of muscle.

**Objective:** Main purpose of the study is to identify the complication in patients undergo total knee replacement having rheumatoid arthritis.

**Material and Methods:** This is a retrospective study of 100 patients operated for cruciate sacrificing total knee arthroplasty "between" January 2012 to January 2016 at B. J. Medical College, Civil Hospital Ahmedabad.

**Results:** The mean age of patients in study was 58.3 years. Out of the total 100 patients in our study 75 were females and 25 were males. Average duration of follow up was 3.7 years. Most common complication is late infection which is approximately 5%. Wound Necrosis, Quadriceps failure, immediate infection and Periprosthetic fracture were the other noted complications. Crude survival rate was 95 percent.

**Conclusion:** Total knee replacement mainly relieves pain in most of the patients. There is twice increase the risk of infection in total knee arthroplasty done in rheumatoid patients compare to osteoarthritic patients. The complication following total knee replacement in rheumatoid arthritis are infection, periprosthetic fracture, quadriceps extension failure, late healing, skin necrosis etc.

**Keywords:** Infection, Rheumatoid arthritis, Total knee replacement.

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### Background

Rheumatoid arthritis is a chronic, systemic inflammatory disease, most often involving the small joints of the hands and feet, although synovial joints can be affected mostly knee and hip. The clinical picture of the disease is characterized by synovitis and joint destruction. The joint destruction starts with in first or second years of the disease, however, and continues to progress in advanced disease, when synovectomy is of no benefit, total knee arthroplasty can relieve pain and improve motion in the joint.

Complication mostly occur in patients with rheumatoid arthritis because of,

- poor healing of tissue
- deep wound infection
- severe flexion contracture
- severe joint laxity
- severe osteopenia
- involvement of multiple other joint limiting rehabilitation

Prosthetic joint infection (PJI) is a devastating complication in elective orthopaedic surgery. It leads to removal of implant, prolonged hospitalization, reduce functional capacity, drug resistance, delayed healing. The treatment of prosthetic joint infection are also very high.

**Materials and Methods:** This is a retrospective study of 100 patients operated for cruciate sacrificing total

knee arthroplasty "between" January 2012 to January 2016 at B. J. Medical College, Civil Hospital Ahmedabad.

**Inclusion criteria:** Total knee replacement in patients with rheumatoid arthritis.

**Exclusion criteria:**

- Less than 18 months follow up.
- Patients expired due to an unknown reason.

Preoperative clinical findings were obtained from extensive scrutiny of available records in form of operative records, pre-operative x-rays and case sheets. The questionnaire was made for each and every patients and data was collected regarding pain score, range of motion functional abilities, deformity etc. Methotrexate was discontinued before the surgery and patients were shifted on corticosteroids preoperatively. It's necessary to give stress dose of steroid to prevent adrenal insufficiency at the time of surgery. Medial Para patellar approach was used for all surgery and tourniquet and intraOp antibiotics was given. Post op after x-ray patients were shifted to ward.

**Observation and Results:** In our study, we have included 100 patients out of which 75 were female and 25 were male. Mean age of among 100 patients is 58.3 year. We used various functional outcomes scores to compare the result of total knee arthroplasty in rheumatoid patients compare to the total knee

arthroplasty in patients with osteoarthritis.

**Table 1**

| Variables  | Rheumatoid Patients |         | Osteoarthritic Patients |         |
|--|---------------------|---------|-------------------------|---------|
|  | Pre Op              | Post Op | Pre Op                  | Post Op |
| Kss Score<br>Knee Society Score                                      | 35                  | 83      | 32                      | 81      |
| Womac Score<br>Western Ontario and Macmaster<br>Osteoarthritis Index | 52.01               | 81      | 54.07                   | 82      |
| Range of movement  | 78                  | 109     | 72                      | 106     |
| Fixed flexion deformity  | 9                   | 1       | 15                      | 10      |
| Crude survival rate  | 93%                 |         | 95%                     |         |
| Infection  | 2%                  |         | 5%                      |         |
| Age of involvement   | 58.3yrs             |         | 62.4yrs                 |         |

### Complications

Most common complication is late infection which is approximately 5% compare to 2% in patient with osteoarthritis knee. Wound Necrosis, Quadriceps failure, immediate infection and Periprosthetic fracture were the other noted complications. The risk of developing infection in RA was estimated in one report to be twice the risk in non-RA subjects. The higher acceptability to infections might be explained by a primary disturbance of the immunological system in RA, an acquired impairment of the immune response, or a decrease in the resistance to infections which may occur in any chronic disease.

**Table 2: Rheumatoid arthritis (RA) as a risk factor for revision for infection of a primary joint replacement (PJR)**

| Author, Year (Ref.)        | Study Periods | No. of Replacement Site of Replacement | Ra is a Risk Factor for Infection |
|----------------------------|---------------|--|-----------------------------------|
| Wilson et al, 1990 (17)    | 1973-1987     | 181 knee                               | Yes                               |
| Bengtson and Knutson, 1991 | 1975-1985     | 118 knee                               | Yes                               |
| Robertsson et al, 2001     | 1988-1997     | 223 knee                               | Yes                               |
| Ja'msen et al, 2009 (15)   | 1994-2007     | 135 knee                               | Yes                               |

### Discussion

This is a retrospective study of 100 patients operated for total knee arthroplasty having rheumatoid arthritis at B.J. Medical College, Civil Hospital Ahmedabad between January-2012 to January-2016.

The mean age of patients in our study was 58.3years, which is less than the mean age of patients having total knee arthroplasty with osteoarthritic knee. In rheumatoid arthritis there is early involvement of synovial joints which leads to joint destruction and ultimately patients have to undergo total knee replacement. Ranawat et al 1 studied TKA in young population of less than 55 and 45 years respectively. He reported that rheumatoid arthritis affects the patients in early age than osteoarthritis. There is no such differences among other variables seen in rheumatoid as well as osteoarthritic patients undergoes total knee arthroplasty. But the main factor is complications particularly late infection which is 2 times increased in patients with rheumatoid arthritis than with

osteoarthritis.

The risk of infection further increases in patients with steroid dependent rheumatoid arthritis. Corticosteroids have a negative influence on normal wound healing. They cause disturbance of the angiogenesis, collagen production and reepithelialisation of dermal wounds. There is also a reduction of the neutrophil chemotaxis. The clinical consequences of these effects include delayed wound healing, dehiscence of the incision site and wound infection. The magnitude of the problem seems to depend on the duration of use and the doses of the corticosteroids.

Study of Tim Bongartz ‡ et al, include 462 patients with RA who underwent a total knee replacements. Overall, 23 (3.7%) joint arthroplasties were complicated by an infection during a mean  $\pm$  SD follow up of  $4.3 \pm 2.4$  years. Revision arthroplasty (hazard ratio [HR] 2.99, 95% confidence interval [95% CI] 1.02–8.75) and a previous prosthetic joint infection of the replaced joint (HR 5.49, 95% CI 1.87–16.14) were significant

predictors of postoperative prosthetic joint infection.

Comparison of RA patients with a matched cohort of OA patients identified an increased risk of prosthetic joint infections (HR 4.08, 95% CI 1.35–12.33) in patients with RA.

### Conclusion

There is overall twice increase the incidence of late infection and also other complication in patients with total knee arthroplasty having rheumatoid arthritis compare to patients having osteoarthritis knee.

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