A Study of Clinical Outcomes, Complications and Their Management, of Total Knee Replacement in Patients With Rheumatoid Arthritis

KEYWORDS

INTRODUCTION:
Rheumatoid arthritis (RA) is a chronic inflammatory disorder characterized by synovial hyperplasia and resulting joint destruction. It is the most common form of inflammatory arthritis and affects 1% of men and 3% of women. It is estimated that up to 90% of patients with RA will eventually have the involvement of the knees.

Total Knee Arthroplasty is the gold standard treatment for patients with advanced osteoarthritis. However, in the rheumatoid patient, it presents unique challenges, such as the systemic nature, poor bone quality as a result of prolonged steroid use soft-tissue deformities, Valgus fixed deformities and flexion contractures and the disease process itself. In our present study we plan to look out for clinical outcomes in midterm and long term follow up of rheumatoid patients operated for total knee replacement.

MATERIALS AND METHODS:
This is a retrospective study of 100 consecutive primary TKR in 61 patients with rheumatoid arthritis. A total of 61 patients, (49 females, 12 males) with a mean age of 58.4 years underwent the surgery. AllPoly, high flexion, LCCK and metal back varieties were used in such patients. The mean duration of follow up of patient was 3.7 years. 97% of patients showed improvement in their preoperative pain. The mean range of movement improved from 78.3 to 109.27. 70 percent of patients achieved a ROM of 100 degrees and above. Fixed flexion deformity, extensor lag, and mediolateral instability almost disappeared. The mean knee score improved from 35.22 to 83.01. Statistically significant improvement occur in Postoperative limb functions as shown by increase in WOMAC score from 52.01 to 81 and Knee society functional score improved from 36.4 to 75.1. Late infection was the most common complication, with an overall satisfactory outcome of the study.

Patients were assessed for pain, deformity, range of motion, activity level and functional capabilities preoperatively. Methotrexate was discontinued one week before the surgery and started after SR. those patients on corticosteroids were shifted to IV steroids perioperatively. Medial parapatellar incision was used for all our surgeries. Choice of implant was guided by preop stability and deformity of patient’s knee and economic considerations.

SPECIAL CONSIDERATION FOR TOTAL KNEE REPLACEMENT IN RHEUMATOID KNEE
It has been common practice to administer stress-dose steroids at the time of surgery to patients who take chronic maintenance steroids. The purpose of this is to prevent adrenal insufficiency. We discontinued methotrexate and other similar agents 1-2 weeks before surgery and restarted them 1-2 weeks after surgery. Medial parapatellar incision being in line with skin cleavage lines is the preferred incision. We used PCL substituting knees in all our patients. No patellar resurfacing was done however we routinely performed patelloplasty. Soft tissue release as required was done for deformity correction. Patients that had persistent flexion contracture post operatively were given posterior knee brace. Aggressive rehabilitation was started in form of electronic stimulation in patients in whom extensor lag did not improve with regular rehabilitation protocol.

No special note was made for events like delayed wound healing, post operative infections, nerve palsy or periprosthetic fracture.

At follow up patients were examined clinically for deformity, laxity, extensor lag, residual flexion deformity and any...
patellar complaints were noted. Functional assessment was done by using KSS and WOMAC score. KSS score of 85 or more was considered excellent, score of 61-84 was considered good and <60 was considered poor out come.

Radiological assessment was done in form of AP, lateral x-rays and skyline view. Postoperative varus valgus was calculated from AP radiograph

End point of survival was removal or revision of any component for any reason. Thereafter we calculated a crude survival rate from the collected data.

**OBSERVATION AND RESULTS:**
We have made these observations and done statistical analysis of data collected from 100 patients of total knee replacement in rheumatoid population.

The average age of patients in our study was 58.44 years. Out of the total 61 patients in our study 49 were females and 12 were males. Our study included a total of 39 patients of bilateral TKA and 22 patients of unilateral TKA. The mean duration of follow up of patient was 3.7 years.

We used all poly variety of prosthesis in 20 knees, hiflex type in 9 (2 revisions and 7 primary) patients and metal back variety in 18 patients. Choice of implant was based on preoperative knee deformity and laxity. No statistically significant difference in functional results with different type of implant was observed.

<table>
<thead>
<tr>
<th>TYPE OF IMPLANT</th>
<th>Mean improvement</th>
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<tbody>
<tr>
<td></td>
<td>KSS(k) KSS(f)</td>
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<tr>
<td>All poly</td>
<td>87.15 76.75</td>
</tr>
<tr>
<td>HIFLEX</td>
<td>82.54 75.6</td>
</tr>
<tr>
<td>Metal back</td>
<td>85.27 80</td>
</tr>
<tr>
<td>Lcck</td>
<td>75.88 58.88</td>
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**Pain score**
Patients preoperatively experienced moderate to severe. Post operative majority of patients showed improvement in pain. Those with moderate pain were mostly those with complications post TKA.

93(97%) patients showed improvement in their preoperative pain. And 82(85%) patients had no pain or just mild pain.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Pre-op</th>
<th>Post-op</th>
<th>Significance</th>
</tr>
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<tbody>
<tr>
<td>WOMAC Score</td>
<td>52.01</td>
<td>81</td>
<td>yes</td>
</tr>
<tr>
<td>KSS Knee Score</td>
<td>35</td>
<td>83</td>
<td>yes</td>
</tr>
<tr>
<td>KSS Functional Score</td>
<td>36.4</td>
<td>75.1</td>
<td>yes</td>
</tr>
<tr>
<td>ROM</td>
<td>28.3</td>
<td>109.27</td>
<td>yes</td>
</tr>
<tr>
<td>Flexion Defor-</td>
<td>9 degrees</td>
<td>1 degree</td>
<td>yes</td>
</tr>
<tr>
<td>mit</td>
<td>Extensor Lag</td>
<td>6 degrees</td>
<td>1 degree</td>
</tr>
<tr>
<td>Alignment</td>
<td>1 degree varus</td>
<td>5 degrees valgus</td>
<td>yes</td>
</tr>
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Both atrophy and failure of volitional activation of the quadriceps femoris muscle have been suggested as causes of decreased muscle force in people with knee arthritis.

Post operative flexion contracture

The current consensus among knee surgeons is that flexion contractures should be corrected to the maximum extent possible at the time of TKA.

Patients were followed-up and compared for survival, range of motion, knee society score, function, anterior knee pain, patellar or any other complication and radiological evaluation.

The mean KSS knee score improved from 35 to 83. KSS Functional scores were improved from 36.4 to 75. WOMAC score improved from 52.01 to 81.1. All scores showed a statistically significant improvement. These can be compared with studies done by Klemmens et al and Yamanaka et al. Those with average or poor results belonged to that group of patients who suffered from complication in form of periarticular fracture and infections.

Pain is the most common indication for total knee replacement surgery. 97% of patients showed improvement in their preoperative pain. Studies by Lee et al and Laskin demonstrated similar remarkable reduction in pain scores of patient. In our study 15 knees had moderate pain post operatively while none had severe pain. Those with persistent moderate pain were mostly the ones with complications post TKA.

Lifestyle of rheumatoid population is affected by the multisystemic and polyarticular nature of the disease. In particular the involvement of knee joint in late stages leads to severe limitation of activity to the extent that many a times patient becomes bed ridden. There was statistically significant improvement (p value<.05) in activity of rheumatoid patient operated with TKA. Patients with complications continued to have poor activity level. However none of the patients with complication were bedridden at follow up. All were able to do household work with or without assistive devices.

The mean range of movement improved from 78.3 to 109 degrees.

Ole et al showed a ROM of >95 degree in 88 percent of patient their median range was 104 -111 degree. Klemmens et al had an average active range of movement of 98 degree.

Before and after surgery the mean FFD in our series of patients improved from 9 degrees to 1 degree. These can be compared with Lee et al and Abernethy et al.

Rheumatoid patients develop weakness of quadriceps muscle due to disuse. The average extensor lag improved from 6 degree to 1 degree , comparable to studies of Laskin etal and Kaltsas.

Though valgus deformities are commonly seen in rheumatoid population still majority present with a varus deformity only. The mean deformity pre operatively was 1 degree varus. At follow up, the mean was 5 degrees valgus.

Varus valgus deformities seen in rheumatoid arthritis patients are almost always due to asssymetrical loss of articular cartilage.

Late infections were the most common complication noted which were a direct cause of failure of implant requiring removal of implant and revision surgery or arthrodesis. Superficial infections were seen in 3 patients all these patients responded to regular dressing. Rheumatoid patients have a weakened immune system because of disease perse and effect of steroids and other DMARDS on immunity. Similar results can be seen in studies of Kaltsas et al, Yamanaka and Laskin.

CONCLUSION:
Total knee replacement was responsible for pain relief, which is the most common indication, in majority of the patients. ROM improved in patients after TKA in general, however most significant improvement were seen in patients who were bedridden preoperatively because of severe deformities. Both increased ROM and decreased pain

REFERENCE