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(RESEARCH ARTICLE)

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Functional results of total knee prosthesis in the treatment of rheumatoid arthritis: A case report of 64 patients

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Abstract

This is a retrospective study of 64 total knee arthroplasties for inflammatory rheumatism, implanted in the Traumatology and Orthopedic Surgery Department (A) of the HASSAN II University Hospital in Fez Morocco, from February 2008 to December 2022.

The aim of our work is to demonstrate the value of total knee arthroplasty in improving the quality of life of young patients with inflammatory rheumatic diseases, notably through pain relief and improved joint mobility.

Our series included 44 patients, representing 64 arthroplasties.

The mean age at the time of surgery was 48 years. All our patients were followed up at the consultation with a clinical and radiological examination. The IKS score was used to assess knee condition before and after surgery.

The surgical procedure consisted of total knee arthroplasty using a total knee arthroplasty.

Clinical results after a mean follow-up of 60 months were satisfactory, with a marked improvement in the postoperative IKS score.

Keywords: Rheumatoid arthritis; Total knee arthroplasty; Inflammatory arthritis; Functional results

1. Introduction

Rheumatoid arthritis (RA) is often characterized as an autoimmune inflammatory disease, causing damage to cartilage and bone with progression to deformity and eventual loss of function.

Knee arthroplasty remains the treatment of choice for advanced rheumatoid knee disease with signs of joint destruction.

The orthopedic surgeon must pay particular attention to the unique challenges presented by this patient population pre-, intra- and postoperatively, in order to maximize the success and quality of life of these patients.

The aim of our work is to demonstrate the value of total knee arthroplasty in improving the quality of life of young patients with inflammatory rheumatic diseases, notably through pain relief and improved joint mobility.

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2. Materials and methods

2.1. Material

This was a retrospective study of 64 total knee prostheses in 44 patients operated on successively at the Traumatology and Orthopedic Surgery Department A of the Hassan II University Hospital in Fez, spread over a continuous period of (14) years from February 2008 to December 2022.

2.1.1. Inclusion criteria

- Patients aged over 19 years.
- Patients suffering from rheumatoid arthritis with unilateral or bilateral knee involvement.

2.1.2. Exclusion criteria

Patients with other knee arthropathies: ankylosis, spondylitis, gonarthrosis, etc.

2.2. Study methods

A dedicated data sheet was used to collect epidemiological, clinical, para-clinical, therapeutic and evolutionary data from medical records. We also followed up patients to assess clinical and radiological results after total knee arthroplasty, in order to study the epidemiological profile of our patients, evaluate our results and compare them with the literature.

3. Results

- The average age of our patients at the time of surgery was 48 years, with extremes of 22 and 76 years.
- The majority of our patients were female (35 women and 9 men).
- Daily physical activity in our patients was as follows: 12% bedridden 56% sedentary 32% working during the day.
- Type of prosthesis used:
  - Post-stabilized cemented 57 cases (FHK)
  - 5 constrained condylar Knee(CCK) and 2 hinged knee
- Prosthesis side: 45% of patients in our series benefited from bilateral TKA implantation, and unilateral prosthesis was used in 55% of patients
- The preoperative knee IKS score was 85/200, with extremes of 30 and 125, with a function score (walking, stairs) of 35/100 and an examination score (pain-stability-mobility) of 50/100. At the last assessment, the average score was 150/200, with a function score of 70/100, and an examination score of 80/100.

Table 1 IKS score evaluation

	Pre-operative	**Post-operative**	**Average gain**
IKS knee	50	80	30
IKS function	35	70	35
IKS global	85	150	65

- Our results were excellent in 73.25%, good in 19.3% and poor in 7.45%.

3.1. Clinical case

38-year-old female, diabetic for 5 years, treated for rheumatoid arthritis for 19 years with long-term corticosteroid therapy, methotrexate, SLZ and Isone.

Figure 1 Front and profile X-ray of a rheumatoid knee

Figure 2 Radiographic check-up after FHK total knee arthroplasty with long tibial keel

4. Discussion

RA patients are often younger (by around 10 years or more) than OA patients at the time of TKA. In the series by Rajesh, Fujiwara and Young, the mean age at implantation was 55, 59 and 62 years respectively. [1 ,2 ,3]

The patients operated on by Toualbi [4] had an average age of 35, ranging from 30 to 50 years. It is well known that up to half of RA patients with knee pain have concomitant hip involvement.

The cervical spine also needs special attention in patients undergoing surgery. Collins et al [5] reported that 61% of RA patients undergoing knee or hip replacement had radiographic evidence of cervical spine instability in their study.

As well as the cardiovascular system for patients with rheumatoid arthritis (RA) given their association with an increased risk of myocardial infarction (MI) and mortality within 6 weeks postoperatively.[6]

Involvement of other joints, particularly the ipsilateral ankle and/or contralateral knee, should be assessed, as it often prevents adequate rehabilitation. Upper limb involvement should also be assessed prior to TKA. [7,8].

Since the use of disease-modifying antirheumatic drugs (DMARDs), biological agents and Janus kinase (JAK) has significantly improved the quality of life of rheumatoid arthritis patients, the number of TKA has declined in recent years[9.10]. However, RA patients can develop osteoporosis, and ligament loosening with joint deformities; surgery therefore remains a crucial option for the treatment of RA [11].

4.1. Results of total knee arthroplasty

Functional results were assessed according to the IKS knee score (international knee society).

In the Rajesh series [1], the mean IKS score was 89.6, with function and examination scores of 46.8 ± 14.6 and 42.8 ± 8.2 respectively. At the last re-evaluation, this score rose to an average of 175.5, with a function score of 86 ± 8.9 and an examination score of 86.5 ± 4.6.

In Fujiwara's study series [2], the mean preoperative IKS score was 40.7/200, with a clinical score of 16.6/100 and a functional score of 24.1/100.At postoperative re-evaluation, the IKS score rose to a mean of149.9/200 with a clinical score of 92.9/100 and a functional score of 57/10.

In Young Kyun Woo's series [3], the mean IKS score before surgery was 91.1/200, with a function score of 43.6/100 and an examination score of 47.50/100. At the last re-evaluation, this score rose to an average of 173.5/200, with a function score of 82.3/100 and an examination score of 91.2/100. Results were excellent in 39.1% of cases, good in 52.79% and poor in 8.09%.

In Toualbi's series [4], the preoperative knee IKS score was 81/200, with a function score (walking, stairs) of 41/100 and an examination score of 40/100. At the last assessment, this score rose to an average of 166/200, with a function score of 75/100 and an examination score of 91/100.

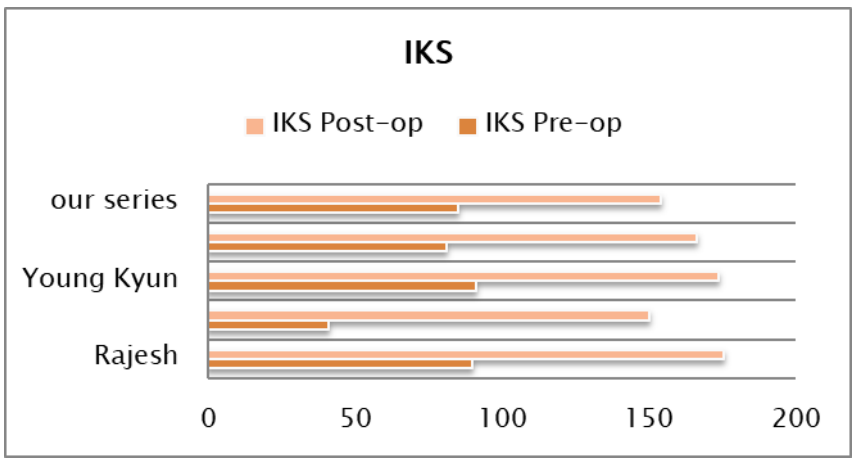

Figure 3 Postoperative IKS score trend

Lee et al [12] concluded that TKA has emerged as one of the most effective surgical procedures for reducing pain and improving physical function in RA patients despite the difficulties often encountered due to poor soft-tissue healing, higher rates of deep wound infection, severe preoperative joint deformity and laxity, low bone stock and involvement of other multiple joints that prevent adequate rehabilitation.

A recently published meta-analysis [13] including 24 studies comparing outcomes after TKA in RA versus OA patients found that RA patients were more satisfied than OA patients despite increased risk of overall infection, deep infection,

venous thromboembolism (VTE), pulmonary embolism (PE) and peri-prosthetic fractures, and reasonable evidence of increased risk of DVT and length of stay.

On the other hand, the results showed that there was no evidence of differences in superficial site infection, revision rate, mortality and prosthesis loosening after arthroplasty.

4.2. Cemented/uncemented prosthesis

Most authors, as well as our study, recommend orthopedic cement-fixed total knee arthroplasty in patients with rheumatoid arthritis, due to the initial stability of fixation and the long durability of the components. However, similar results have been recorded at long-term follow-up in patients who have undergone uncemented TKA, as in Young's series [3], These advantages include better bone stock in case of revision due to conservative bone cuts and lack of biological response to polymethyl methacrylate, short tourniquet duration during surgery and low cement extrusion and wear.

5. Conclusion

Knee arthroplasty has emerged as one of the most effective surgical procedures for reducing pain and improving physical function in RA patients.

Through this retrospective study and the small number of patients included, we were able to conclude that despite the complexities often encountered in RA patients, a well-programmed and well-executed knee arthroplasty improves overall function and quality of life in patients with disabling knee RA.

Compliance with ethical standards

Disclosure of conflict of interest

The authors have no competing interests to declare that are relevant to the content of this article.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study .

Authors' contributions

All authors contributed to the patient's care and to the drafting of the manuscript. All authors have read and approved the final version of the manuscript.

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