

## EXPERIENCES WITH TOTAL HIP REPLACEMENT ARTHROPLASTY *AD MODUM* RING

I. RUSZKOWSKI & S. KOVAČIĆ

Department of Orthopaedic Surgery, Medical Faculty,  
University of Zagreb, Zagreb, Yugoslavia

The results of total replacement of the hip joint *ad modum* Ring are presented. The review includes 63 hips (from among the total number of cases operated by the various methods) followed up for periods ranging from 6 months to 5 years. The assessment has shown excellent results in 33.3 per cent, good results in 50.8 per cent, fair in 9.5 per cent and poor results in 6.4 per cent. Advantages and disadvantages of the method are discussed.

*Key words:* Ring total hip prosthesis; hip joint

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Total replacements of the hip joint *ad modum* Ring (Ring 1968, 1970, 1971, 1973, 1974) have been performed at the Orthopaedic Hospital, Medical Faculty, University of Zagreb, since 1970. It was decided to use Ring's prosthesis, because it seemed well designed biomechanically and did not involve the use of cement. It should be emphasized that the indications for total replacement of the hip joint have been extremely conservative. It has been used only in cases when no other type of surgery could be expected to offer better results with regard to the local alterations in the hip joint, the patient's age and profession.

(modified from the evaluation of results used by Ring).

Excellent results in this evaluation included completely stable and painless hips with a range of flexion over 90° and corresponding abduction, adduction and rotation.

*Table 1. Sex and side distribution.*

	Right	Left	Bilateral	Total
Female	19	21	2	42
Male	7	12	2	21
Total	26 41.3%	33 52.3%	4 6.4%	63 100%

*Table 2. Hip disorders*

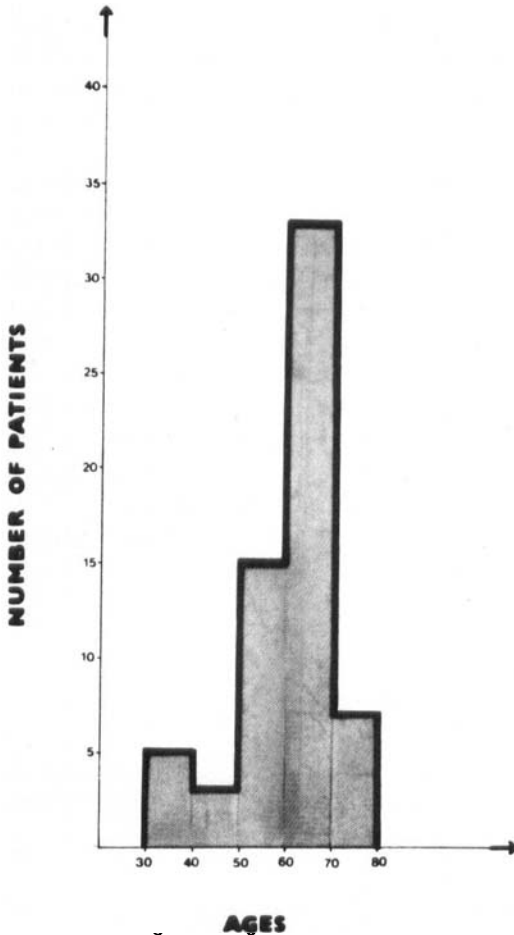
	Number of hips	Percentage
Osteoarthritis	44	69.8
Congenital dislocation	7	11.2
Rheumatoid arthritis	4	6.4
Ankylosing spondylitis	4	6.4
Femoral head necrosis	3	4.7
Injury	1	1.5
Total	63	100

### PATIENTS AND METHODS

Sixty-three operations on 59 patients were carried out (Table 1).

The disorders causing the hip alterations are shown in Table 2 and the age distribution of the patients (the majority were between 60 and 70) is given in Figure 1.

The assessment of the results is based on the usual three main factors: stability of the hip during walking, pain, and range of movement



Good results included those patients who sometimes had to use one stick when walking and had intermittent moderate pain or continuous slight pain. The flexion of the hip was between 60° and 90° while other movements were somewhat restricted.

Fair results included patients who had to use a stick or a short crutch and had moderate pain all the time, and whose flexion ranged between 30° and 60°, while their other movements were restricted.

Poor results included those patients who were unable to walk without crutches, had constant and severe pain, and their range of all hip movements was poor, flexion being less than 30°.

The patients have been checked at 3- to 6-month intervals after the operation, and the evaluation includes the follow-up examinations carried out 6 months to 5 years after the operation (Table 3).

Table 3. Period of review

Years	Number of hips	Percentage
1/2-2	17	26.9
2-3	20	31.8
3-4	6	9.5
4-5	20	31.8
Total	63	100

## RESULTS

The results of the operations graded according to the above evaluation are shown in Table 4.

### Complications

There were no complications at surgery; there was no dislocation of the prosthesis, bone fracture, or lesion of the sciatic nerve.

Among late complications there were three cases of instability of the prosthesis as a result of infection and two patients developed loosening of the prosthesis without evidence of infection. The prosthesis had to be removed in the three cases of infection because of functional and subjective complaints. Arthrodesis was carried out in one case and a Girdlestone operation in two cases.

In order to prevent infection Keflin has been administered according to an agreed schedule, since 1973, i.e., in the 24 most recent cases. None of these developed infection. Anticoagulants have been given in all cases with previous thrombosis or with

Table 4. Results.

Grading	Number of hips	Percentage
Excellent	21	33.3
Good	32	50.8
Fair	6	9.5
Poor	4	6.4
Total	63	100

marked varicose veins of the lower extremities.

Migration of the prosthesis occurred in one case of infection and in one case of bilateral replacement where the patient had ankylosing spondylitis. In some cases a radiolucent zone around the acetabular stem of the prosthesis was noticed. This zone, about 1 mm in diameter, was surrounded by denser bone and is probably a layer of fibrous tissue. This so-called halo effect was not linked with subjective symptoms in the majority of cases. Para-articular calcifications when present did not cause subjective complaints either, but the range of movement was somewhat restricted.

## DISCUSSION

In the authors' experience preliminary results of the application of Ring's prosthesis were satisfactory provided the indications for the operation were strictly adhered to and the operative technique was of a high standard.

As in all other total replacements of the hip joint performed in this hospital, i.e., *ad modum* McKee-Farrar and St. George, the indications have been very conservative. Ring's prosthesis has been applied mainly in patients without marked osteoporosis who were expected to perform heavy work post-operatively.

As regards the surgical technique, it might be added that it is more difficult to perform than other methods of total replacement of the hip, particularly as regards the application of the acetabular part of the prosthesis. An altered position and shape of the acetabulum could present difficulties in orientation especially when inserting the stem of the pelvic component. In our opinion full weight-bearing should not be introduced until 2 or 3 months after surgery. In most cases with earlier weight-bearing signs of pelvic instability with a positive Duchenne-Trendelenburg's symptom occurred and this was regarded as an undesirable reaction to the reflexive unburdening of the hip.

We have noticed that the results tend to deteriorate in the course of time.

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Correspondence to: Professor I. Ruszkowski, Department of Orthopaedic Surgery, Medical Faculty, University of Zagreb, 41000 Zagreb, Yugoslavia.