

BENEFITS OF MULTIPLE JOINT REPLACEMENT IN RHEUMATOID ARTHRITIS

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ABSTRACT. The benefits of multiple joint replacements were assessed in 21 patients with rheumatoid arthritis who had bilateral hip and knee replacements. The main benefit was relief of pain with 40 hips and 25 knees becoming completely pain-free. There was an improved range of movement in 38 hips but in only 11 knees and 8 knees were stiffer after surgery. Hip replacement was the preferred initial surgery but there was a mean delay of 50 months between hip and knee surgery suggesting a "domino effect" with increasing mobility as a consequence of hip replacement eventually causing knees to deteriorate. All patients who completed a postal questionnaire found their ability to walk had improved but many noted an increase in ankle and foot pain which limited their walking. After their surgery patients were better able to perform certain activities of daily life, especially housework and dressing. It is concluded that multiple joint replacement contributes to improving the quality of life in disabled arthritic patients.

Key words: Arthritis, rheumatoid, arthroplasty, hip joints, knee joints

It has been estimated that 10% of patients with rheumatoid arthritis might benefit from major reconstructive surgery (1) and the earlier success of total hip replacement in inflammatory arthritis (2, 7, 10) has been followed by encouraging results with various knee replacements (16). Arthroplasty of more than one weight bearing joint is frequently necessary (8, 9, 11) and occasionally both hips and knees need replacement surgery (12, 13). The role of multiple joint replacement in the rehabilitation of the rheumatoid patient needs to be clearly defined and this study has assessed the results of bilateral hip and knee replacements and the patient's attitude to their surgery.

PATIENTS AND METHODS

Twenty-one patients (18 female, 3 male) with rheumatoid arthritis have had total joint replacement of both hips and both knees at Wrightington Hospital. Total hip replacements were with Charnley low friction arthroplasties (6) and knee replacements were with Charnley load-angle inlays (15) except for one patient who had an Attenuborough knee prosthesis (3).

The details obtained from the medical records included patients age and disease duration at the time of initial surgery, the indication for surgery, the sequence and intervals between individual joint replacements and the post-operative complications. The hips were graded pre- and post-operatively for pain and range of movement on the six digit scale of d'Aubigne and Postel (4) as modified at Wrightington (14) (Table I) and the knees were graded for pain and range of movement on a four point scale (Table II). The post-operative assessment was carried out at least three months after the final surgery and patients were also sent a questionnaire at an interval which varied from three months to six years (mean 21 months) after their final surgery and asked to assess the effects of surgery on their pain, mobility and activities of daily living.

RESULTS

The patients mean age at the time of the first operation was 42 years (range 21-71) and the duration of the disease varied from 5-25 years (mean 12 years). The preferred initial procedure was hip replacement and 19 patients had bilateral hip replacements before their knee surgery. The indications for the initial surgery were usually a combination of severe pain and immobility but in four patients with relatively little pain the surgery was undertaken to improve their mobility. A study of the intervals between the various operations shows that the longest delay occurred between the second and third joint replacements, that is between hip replacement and later knee surgery (Table III).

The surgical results may be assessed by comparing the pre- and post-operative scores for pain and range of movement (Tables IV and V). The mean pre-operative score for hip pain was 3.3 showing that before surgery most patients had pain limiting their activity but after surgery 40 of the total series of 42 hip replacements became completely pain-free and two had slight or intermittent discomfort. The range of movement after surgery was improved in 38 hips but was unchanged in three and became worse in one.

The mean pre-operative score for knee pain was 1.9 and shows that most patients had severe pain

Table I. Index used to assess hip function in patients before and after total hip replacement

Score	Range of hip movement	Pain
1	0-30	Severe spontaneous pain
2	31-60	Severe on walking, prevents all activity
3	61-100	Tolerable with limited activity
4	101-160	Present only after activity: disappears quickly with rest
5	161-210	Slight or intermittent, decreasing with activity
6	210-260	None

before their surgery. After surgery 25 of the 42 knee replacements became pain-free, 12 had a reduction in pain by at least one grade and five had no change in their pain scores. None of the patients had an increase in pain as a result of their knee surgery. The range of movement was improved after surgery in 11 knees but was unchanged in 23 and in eight the knees were less mobile after joint replacement.

There were few major post-operative complications and these included pulmonary thromboembolism (two patients), hip sepsis (one patient) and foot drop (one patient).

A postal questionnaire was sent out at least three months after the final surgery (mean 21 months) but four patients could not be traced and another three had died from causes unrelated to their surgery. Fourteen patients completed the questionnaire (Table VI) and all judged their hip and knee pain to be less although six noted an increase in ankle and foot pain. All patients found their walking ability had improved but 11 continued to use a stick and one still depended on someone's help in walking. Nine patients felt their ability to dress had improved

Table II. Index used to assess knee function in patients before and after knee replacement

Score	Range of knee movement	Pain
1	0-30	Severe
2	31-60	Tolerable
3	61-90	Only during exercise
4	>90	None

Table III. Intervals between different operations

Surgery	Mean time (months)	Range (months)
1st-2nd	10	1-41
2nd-3rd	50	3-125
3rd-4th	15	1-58
1st-4th	75	14-154

and 10 were able to put on their own socks. Six patients found bathing to be easier but only three were able to get in and out of a bath unaided. All patients were independent for toilet care.

DISCUSSION

The results of surgery in 21 patients who had both bilateral hip and knee arthroplasty have been assessed quantitatively by using a numerical grading system for pain and range of movement. In this study, as in others, the main symptomatic benefit was relief of pain and hip surgery was usually more successful than knee surgery in producing pain relief. The range of movement of the hips was im-

Table IV. Scores before and after total hip replacement

Pre-operative scores	Post-operative scores						Total
	1	2	3	4	5	6	
<i>Pain</i>							
1							
2				1	1	6	8
3						20	20
4						8	8
5						4	4
6						2	2
Total				1	1	40	42
Mean pre-operative score 3.3							
Mean post-operative score 3.9							
<i>Range of movement</i>							
1			1	6	3		10
2				1	5	1	7
3				2	7	4	13
4					8		8
5				1	3		4
6							
Total			1	10	26	5	42
Mean pre-operative score 2.7							
Mean post-operative score 4.8							

Table V. Scores before and after knee replacement

Pre-operative scores	Post-operative scores				Total
	1	2	3	4	
<i>Pain</i>					
1		2	6	6	14
2			6	12	18
3			3	6	9
4				1	1
Total		2	15	25	42
Mean pre-operative score 1.9					
Mean post-operative score 3.5					
<i>Range of movement</i>					
1	2	2	2	6	
2		1	5		6
3		1	15	2	18
4		1	6	5	12
Total	2	5	28	7	42
Mean pre-operative score 2.7					
Mean post-operative score 3.0					

proved post-operatively but the knees tended to remain in their pre-operative range or lose motion and this implies that the main indication for joint replacement in polyarthritis should be the relief of pain rather than the improvement of mobility.

The results obtained by comparing the pre- and post-operative grades are supported by the patient's own subjective assessments and all those who completed the postal questionnaire stated that their hip and knee pain was less. Most patients thought their activities of daily living had improved and this was most noticeable during housework and less so for dressing and bathing. The disabilities which are most likely to result from arthritis of weight bearing joints (5) improved the most and all patients completing the questionnaire were able to get on and off

their own toilet and most were able to put on their own socks.

The results reported here show that extensive surgery in rheumatoid patients can result in worthwhile improvement, in pain relief and in the activities of daily living. The long mean interval of 75 months between the first and the last operations emphasises that the surgery was undertaken because of slowly progressive disease rather than as a challenge of terminating a patient's wheelchair existence during a single lengthy admission. A study of the intervals between individual operations shows that the longest delay occurred between the second and third operations, that is after the completion of hip surgery and before the knee replacements and it seems that the success of hip replacement in relieving pain and improving mobility might have been responsible for the progression of symptoms in unoperated joints and in particular an increase in knee pain which eventually necessitated knee replacements.

The patients who completed the questionnaire after their final surgery all commented that their walking ability had improved but six patients noted an increase of pain in their ankles and feet. It is therefore difficult to predict the effect of replacing an individual weight bearing joint in rheumatoid arthritis for there appears to be a "domino effect" in which improvement in mobility as a result of surgery accelerates the disease in unoperated joints.

This study has shown that multiple joint replacement in the rheumatoid patients is effective in relieving pain and although arthroplasties of the hips and knees may lead to new problems in unoperated joints there is usually considerable improvement in walking ability and in the activities of daily living.

Table VI. Results of postal questionnaire on effects of surgery (14 patients)

	Im- proved	Un- changed	Worse
Walking ability	14	0	0
Hip pain	14	0	0
Knee pain	14	0	0
Ankle and foot pain	0	8	6
Dressing	9	4	1
Housework	11	3	0
Bathing	6	7	1

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