

Long term results of arthrodesis for severe osteoarthritis of the hip in young adults

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Summary. *We examined 40 patients (12 men, 28 women) who had undergone hip arthrodesis for severe osteoarthritis more than 15 years previously. Twenty-one cases were due to congenital dislocation of the hip. The age at fusion was mostly between 30 and 39 years. There was no case in which the position of fusion was unsatisfactory. At follow-up, 26 patients had back pain, 9 had pain in the same knee, 2 in the opposite knee and 3 had pain in both knees. Pain in the opposite hip occurred in 5 patients who had slight osteoarthritic changes on the preoperative radiographs. Every patient had been able to return to his or her previous occupation. Thirty-five had some difficulty in bending during Japanese-style sitting, but all could walk for more than 30 minutes without any difficulty. All but two were satisfied with the operation and none of them wanted to have a total hip replacement. In spite of the disadvantages of arthrodesis of the hip, such as the limitation of some activities and the effect on neighbouring joints, most patients were very satisfied with the result.*

Résumé. *Dans cette étude rétrospective, nous avons examiné, cliniquement et radiologiquement, 40 sujets (12 hommes et 28 femmes) ayant subi une arthrodèse de hanche plus de 15 ans auparavant, 21 de ces cas étaient des ostéoarthrites secondaires à une luxation congénitale de la hanche. Au moment de l'intervention, la plupart des patients étaient âgés d'une trentaine d'années. Chez aucun d'entre eux la position de fusion n'était incorrecte. 26 patients se plaignaient de douleurs lombaires, 9 de*

douleurs du genou homolatéral, deux de douleurs du genou controlatéral et trois de douleurs des deux genoux. 5 patients, qui présentaient des lésions arthrosiques radiologiques avant l'intervention, signalaient des douleurs de la hanche controlatérale. Les altérations radiologiques des articulations adjacentes étaient relativement modestes après l'intervention. Tous les patients ont pu reprendre leurs activités. Trente-cinq éprouvaient des difficultés à s'accroupir à la manière japonaise, mais tous pouvaient marcher pendant plus de 30 minutes sans difficulté. À l'exception de deux cas, les patients étaient satisfaits des résultats de leur opération, aucun n'a exprimé le désir de bénéficier d'une arthroplastie totale. En dépit des désavantages de l'arthrodèse de la hanche vis à vis des articulations adjacentes et de certains actes de la vie quotidienne, la majorité des opérés jugeaient leur état tout à fait satisfaisant.

Introduction

Total hip replacement has become the treatment of choice for severe chronic arthritis of the hip [3, 6], and arthrodesis has been considered outdated. However, the durability of an artificial joint remains in doubt at present [2]. Arthrodesis still seems to be superior to artificial joints in the very long term, but there are doubts concerning the age at which it should be done, the optimal position of fusion and the effect on the knee, lumbar spine and opposite hip joint.

We have analysed the long term results of our cases of arthrodesis in order to determine the appropriate indications for the operation.

Table 1. Summary of the cases

Number of cases operated on since 1953	70 (including 8 who had died)
Number of cases followed up	40 (12 men, 28 women)
Diagnosis	
Secondary osteoarthritis	
Congenital dislocation of the hip	21 cases
Infection	9 cases
Trauma	8 cases
Primary osteoarthritis	
	2 cases
Age at fusion	11–58 years (average 32)
Age at follow-up	31–76 years (average 58)
Duration of fusion	15–32 years (average 26)

Material and methods

We have carried out arthrodesis of a hip on 70 patients more than 15 years ago. Forty of these, 12 men and 28 women, were examined at Niigata University Hospital. Twenty-one patients had suffered from secondary osteoarthritis due to congenital dislocation of the hip. The age at operation and the length of follow-up are shown in Table 1. When seen at follow-up, attention was paid to the position of fusion and any leg length discrepancy, pain and radiological findings in the low back, knees and opposite hip, the activities of daily living, and the patient's opinion of the operation.

Results

The position of fusion and leg length discrepancy

The position was almost always within the planned range, i.e. in 20°–40° of flexion, neutral or in slight adduction, and in neutral rotation

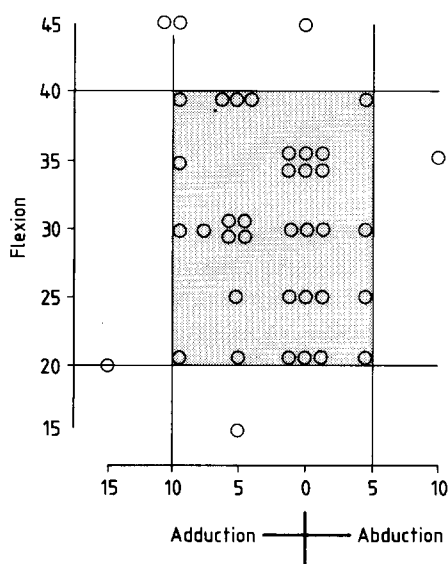


Fig. 1. Scattergram showing the position of the fused hip in flexion, and abduction/adduction

(Fig. 1). There was no case in which the position had changed in the course of follow-up. The leg length discrepancy was within 3 cm in 36 cases, 4 cm in 2 cases, and 5 cm in 2 cases.

Influence of fusion on the neighbouring joints

(1) Lumbar spine. Preoperative radiographs had shown no abnormalities, except for one case of spondylolisthesis. However, at follow-up, there were spondylotic changes in 26 cases (65%). Twenty six patients (65%) had pain or an ache in the low back, and 20 of these had spondylotic changes. Eleven had been treated by medication or pelvic traction, and this relieved the pain in all of them. The low back pain in the remaining 15 cases had been transient, and had not needed any treatment. Case 1 is a man, who had pyogenic arthritis of the hip which was fused at the age of 27. He has been working as a farmer for 22 years and has no low back pain or evidence of spondylosis (Fig. 2).

(2) Knee joints. No patient had pain in the knee before arthrodesis. However, 14 patients (17 knee joints) had both pain and arthritic changes in the radiographs at follow-up. Of these, 9 had pain in the same knee, 2 in the opposite knee and 3 had pain in both knees. Radiographs at follow-up showed osteoarthritis in 21 on the same side and in 9 on the opposite side. The remaining 9 patients did not need any treatment because the pain was so slight. Case 2 is a man whose hip was fused when he was 38 years old. His knees were normal after 28 years (Fig. 3).

(3) The opposite hip. Of 32 patients, who had no radiological signs of osteoarthritis in the opposite hip before operation, 4 who had had a congenital hip dislocation showed early changes of osteoarthritis at follow-up. Eight patients had early osteoarthritis before operation, and this was worse in 4 at follow-up. No patient had symptoms in the opposite hip before the operation, but 5 patients who had osteoarthritic changes before had pain or ache at follow-up. Case 3 had suffered from pyogenic arthritis of the hip in her childhood and arthrodesis was carried out when she was aged 24 years. The opposite hip, which had been normal before operation, showed no change clinically or radiologically after 24 years (Fig. 4).

Limitations of daily living

All could stand on the same leg and walk steadily without pain, except for one patient with ankylosing spondylitis. Weight was borne mainly on the fused side in only 2 cases, and on the opposite side in the remaining 38 cases.

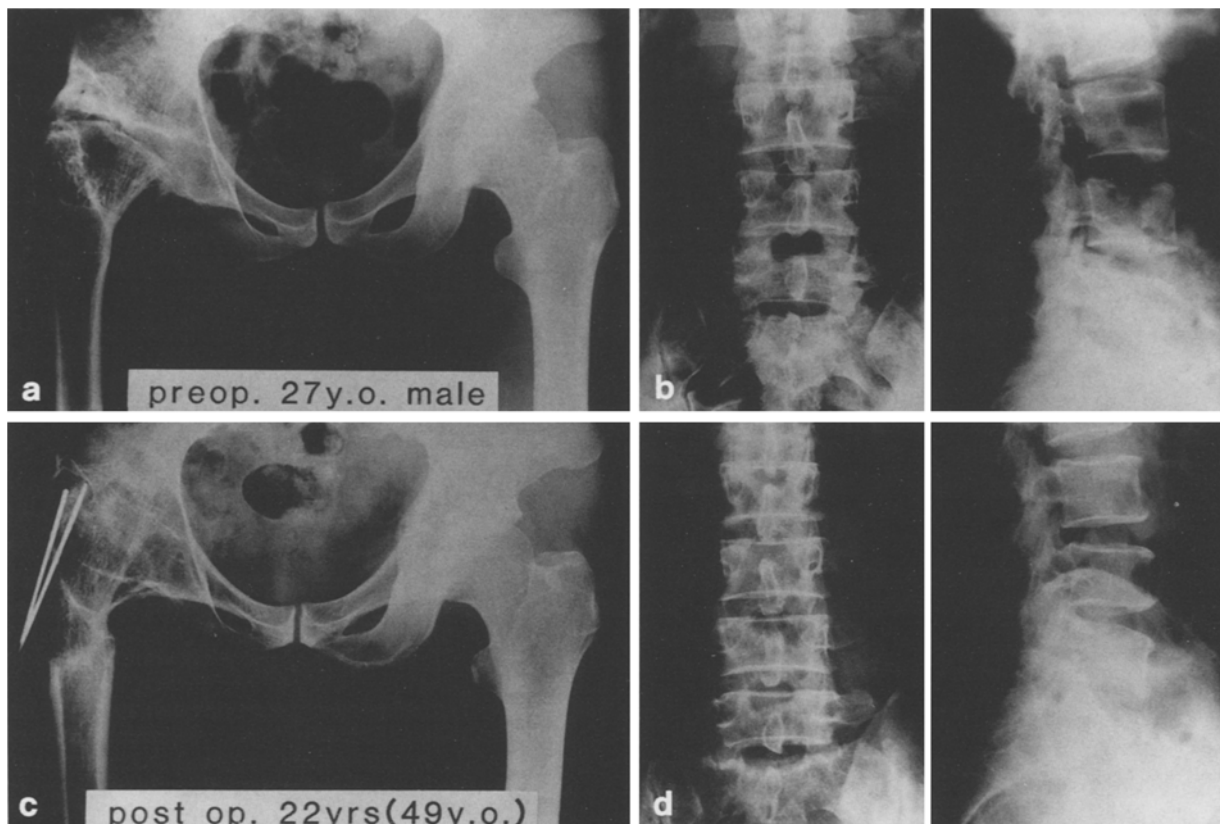


Fig. 2 a–d. Radiographs of a 27 year old man before arthrodesis showing that the opposite hip and lumbar spine are normal (a, b). Radiographs 22 years after arthrodesis. The opposite hip and lumbar spine remain normal (c, d)

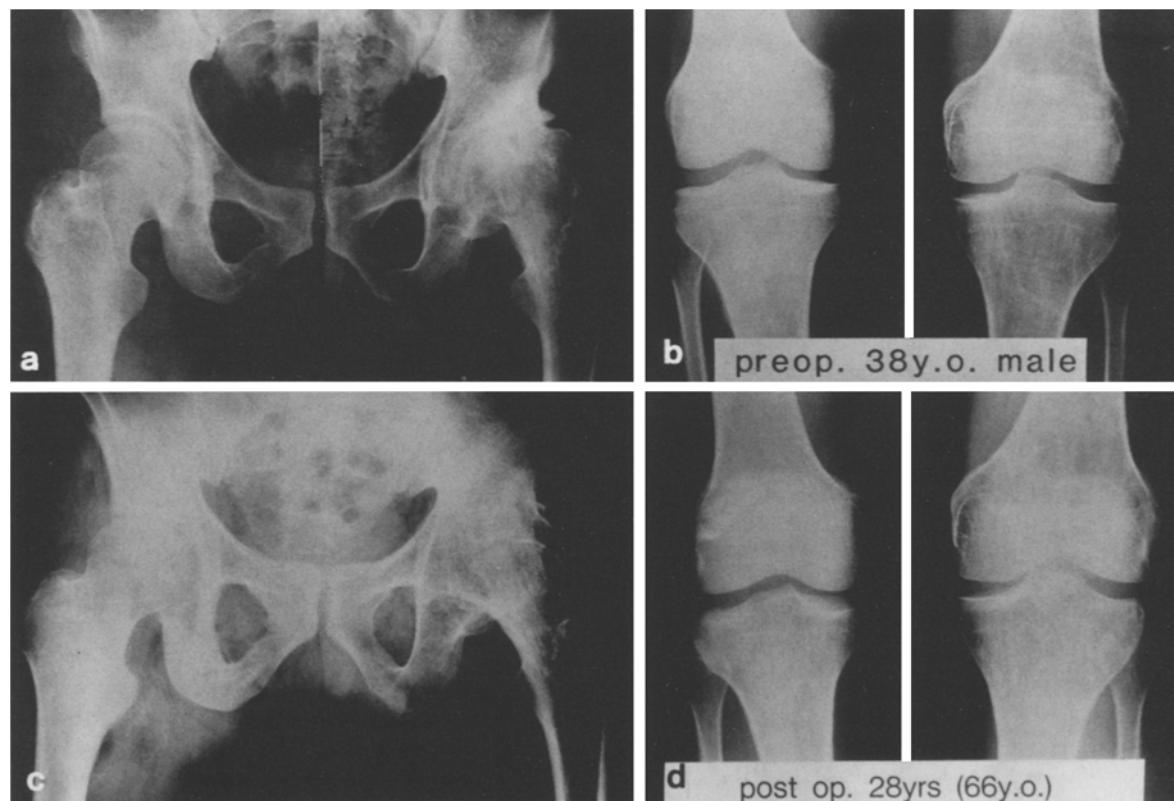


Fig. 3 a–d. Radiographs of a 38 year old man before arthrodesis (a, b). 28 years after arthrodesis, both knees and the opposite hip remain normal (c, d)

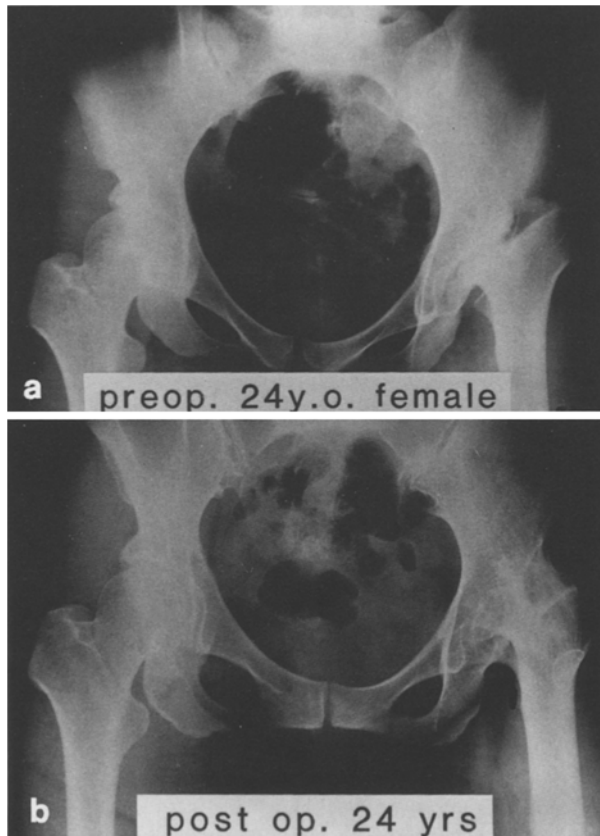


Fig. 4. a Radiograph of the hips of a 24 year old woman before arthrodesis. b 24 years after operation. The opposite hip remains normal

Thirty-five patients (87.5%) claimed that the arthrodesis limited bending during Japanese-style sitting. Other common restrictions were putting on or taking off socks, standing up and walking up or downstairs. Some of these difficulties could be helped by gadgets or appliances. Squatting over the Japanese-style toilet was improved by changing to Western-style toilets. It took six months to a year (average 8 months) for patients to reach a static level of activity after arthrodesis. All returned to their previous jobs, including heavy labour, in an average of one year.

Twenty-two patients, 6 men and 16 women, answered the questions about sexual life. Eight patients, 3 men and 5 women, said they had no problems with sexual activity. Thirteen patients, 3 men and 10 women, claimed that the arthrodesis created a minor problem, but did not make sexual activity impossible.

The patient's opinion

Most patients were satisfied with their stable painless weightbearing leg. Only two were not satisfied

because osteoarthritic changes had progressed in the opposite hip, and in one patient symptoms of ankylosing spondylitis had developed. No patient wanted a total hip replacement.

Discussion

Arthrodesis has been the treatment of choice for osteoarthritis of the hip in adolescence and for infective arthritis, and two recent papers have reported on the long term effects of the operation [1, 5]. In comparing these two series with our own, our follow-up was 10 years less, although the average age of our patients at review was much the same. We did not have any hips fused in such an unfavourable position or with such large discrepancies in leg length as reported in the two other series. The incidence of low back pain was much the same in all three series, but we could not find any correlation between lumbar spondylosis and the position of the fused hip (Fig. 5). We did not find any evidence of osteoarthritis of the sacroiliac joints as reported in the other two series. Pain in the same knee occurred in only 30% of our patients, whereas it was present in 45% and 57% in the reported series. We were also unable to correlate osteoarthritic changes in the knee with the position of the fused hip (Fig. 6), nor did we find any cases with ligament laxity. Pain in the opposite knee was present in 13%, which was lower than that in Sponseller's series [5].

The effect of arthrodesis on the opposite hip has been the main problem, especially for Japa-

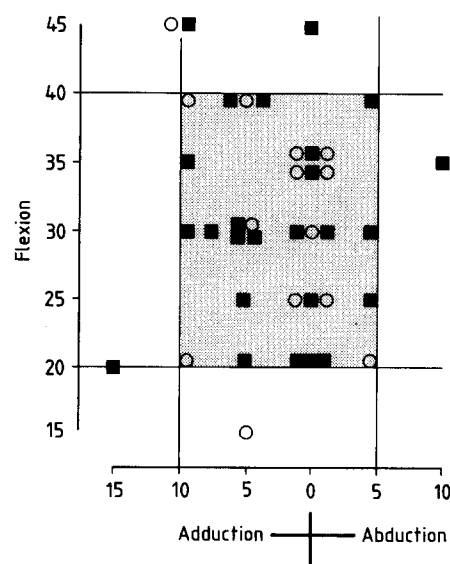


Fig. 5. Scattergram demonstrating that there is no correlation between lumbar spondylosis and the position of fusion. The black squares represent patients with radiological changes of spondylosis

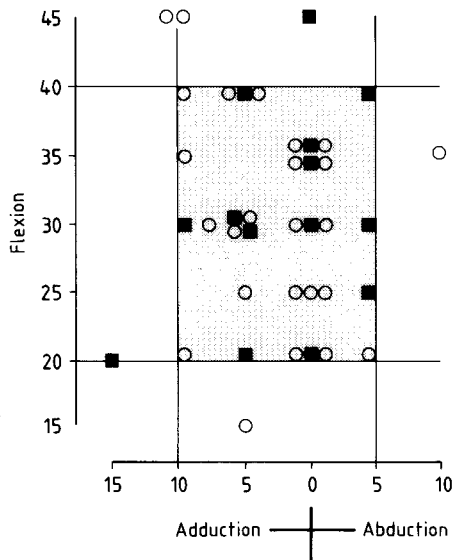


Fig. 6. Scattergram demonstrating that there is no correlation between osteoarthritic changes in the knee on the same side and the position of fusion. The *black squares* represent patients with osteoarthritis

nese patients, because of the high incidence of congenital dislocation in which the contralateral hip is often affected. In four cases among eight (50%) which had shown early osteoarthritis in the opposite hip before arthrodesis, the changes have progressed after operation. This degree of worsening was little different from the 66% reported by Gudmudsson and Gudmundur [4]. Thus slightly

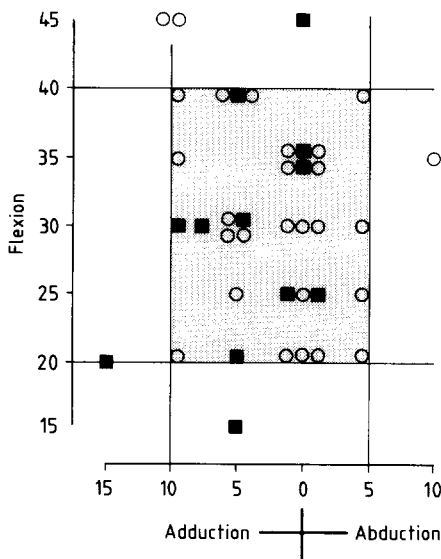


Fig. 7. Scattergram demonstrating that there is no correlation between osteoarthritic changes in the opposite hip and the position of fusion. The *black squares* represent the cases in whom osteoarthritic changes had progressed compared with the pre-operative radiographs

over 50% of the cases with early osteoarthritis deteriorated after operation. When the opposite hip was normal, early osteoarthritis occurred in 12.5%, which was considerably lower than in the other two series [1, 5]. The better position of fusion and the 10 years shorter follow-up in our series might be responsible for the different results. We did not find any correlation between the osteoarthritic changes and the position of fusion (Fig. 7).

Even though arthrodesis affected the spine, the knees and the opposite hip, the extent of this was slight both clinically and radiologically in all cases. Osteoarthritis or spondylosis were not necessarily attributable only to the arthrodesis, but to other factors, such as age, hereditary, family and occupational history.

The fused side became the main weightbearing leg in only 5% of our cases, in spite of the favourable position of fusion, as Gudmudsson had pointed out [4]. In order to make the fused side the main weightbearing leg, instructions and exercise are essential.

Total hip replacement after arthrodesis needs to be considered carefully, because arthrodesis can be satisfactory for a long period. The cause of the patient's dissatisfaction, their age and the condition of neighbouring joints should be evaluated before the fused hip is replaced. We are sure that proper explanation about some of the less satisfactory effects of the operation on the activities of daily life, and mutual confidence between the patient and doctor, are essential for success.

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