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TREATMENT OF PARA-ARTICULAR OSSIFICATION AFTER TOTAL HIP REPLACEMENT BY EXCISION AND USE OF FREE FAT TRANSPLANTS

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Six patients with para-articular ossification after total hip replacement were treated by excision and free fat tissue transplantation. The results of treatment were good and at the follow-up examinations, 2 to 8 years after the operation, a good range of movement of the hip joint was noted in all cases. It was apparent that the free fat transplant had prevented the recurrence of the para-articular ossification.

Key words: fat transplant; hip joint; para-articular ossification

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Para-articular ossification after total hip replacement is a severe condition without any known cure (Nollen & Slooff 1973). According to Eftekhar 1971 and Patterson & Brown 1972, it occurs in about 10 per cent of patients after total hip replacement, but many authors have reported much higher rates (Nollen & Sloof 1973, Rosendahl et al. 1977). The severity of ossification has been graded: at Grade I the hip joint is almost asymptomatic, but at Grades II and III with a bony bridge between the femur and the pelvis a marked limitation of the range of movement is always present, and at Grade III the hip joint can be totally immobilized. In patients developing ossification of Grades II and III the total hip replacement operation must be classified as a failure, and there have been no reports of successful methods of treatment. Thus a Girdlestone procedure was carried out in two cases of periarticular ossification in the series presented by Patterson & Brown 1972.

Since 1965, Langenskiöld has been using free fat transplants, placed on the spinal dura, after operations on lumbar discs. The transplanted free fat prevents the formation of firm scar tissue adherent to the dura, which is thus easily exposed by blunt dissection in connection with new operations (Langenskiöld & Kiviluoto 1976). These results were confirmed by an experimental study on rabbits (Kiviluoto 1976). With free fat grafts, scar tissue formation between the dura and the surrounding tissue was prevented in 92 rabbits after laminectomy operations.

In our clinic free fat transplants have also been used in hip surgery after excision of para-articular ossification following total hip replacement operations. The results will be given in this report.

PATIENTS

Between 1967 and 1977, 468 total hip replacement operations were performed. All cases were operated on by one surgeon (EBR). Of these, 80

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Table 1. Para-articular ossification after total hip replacement

Diagnosis	Age (years)	Sex	Year of replacement	Type of prosthesis	Grade of ossification
Necrosis of the femoral head and osteoarthritis	79	Female	1968	McKee-Farrar	II
Post-traumatic osteoarthritis	63	Male	1970	McKee-Farrar	III
Post-traumatic osteoarthritis	77	Female	1971	McKee-Farrar	III
Post-traumatic osteoarthritis	45	Female	1972	McKee-Arden	II
Degenerative joint disease	59	Female	1973	McKee-Farrar	II
Post-traumatic osteoarthritis	52	Female	1974	McKee-Farrar	II
Degenerative joint disease	60	Male	1976	McKee-Arden	III

were bilateral operations. The McKee-Farrar prosthesis was used in the first 311 cases, after which a high density polyethylene cup was employed for the rest of the cases. The follow-up examinations were undertaken 1 month, 3 months, 6 months, and 12 months after the operation, and then once a year. Seven patients developed para-articular ossification of Grades II or III with pain and limited range of movement of the hip joint and were in need of additional surgical treatment (Table 1). Severe osteoarthritis had been the indication for replacement in three cases and post-traumatic osteoarthritis in four cases.

OPERATIVE TECHNIQUE

In six of the patients the para-articular ossified tissue was completely resected and the excision was followed by transplantation of free fat tissue taken from gluteal or abdominal subcutaneous tissue. Local application of Neomycin and Bacitracin solution (Nebacetin®) was used during the operation and suction drainage was applied for 48 hours. The patients were mobilized after removal of the drainage tube on the second postoperative day. One patient was not treated by surgery, as she was bedridden following a cerebral thrombosis.

Table 2. Results of treatment of para-articular ossification

Grade of ossification	Interval between the operations (months)	Follow-up period (years)	Results of treatment
III	3	8	Good
III	20	3	Good
II	7	6	Excellent
II	4	5	Excellent
II	9	3	Excellent
III	4	2	Good

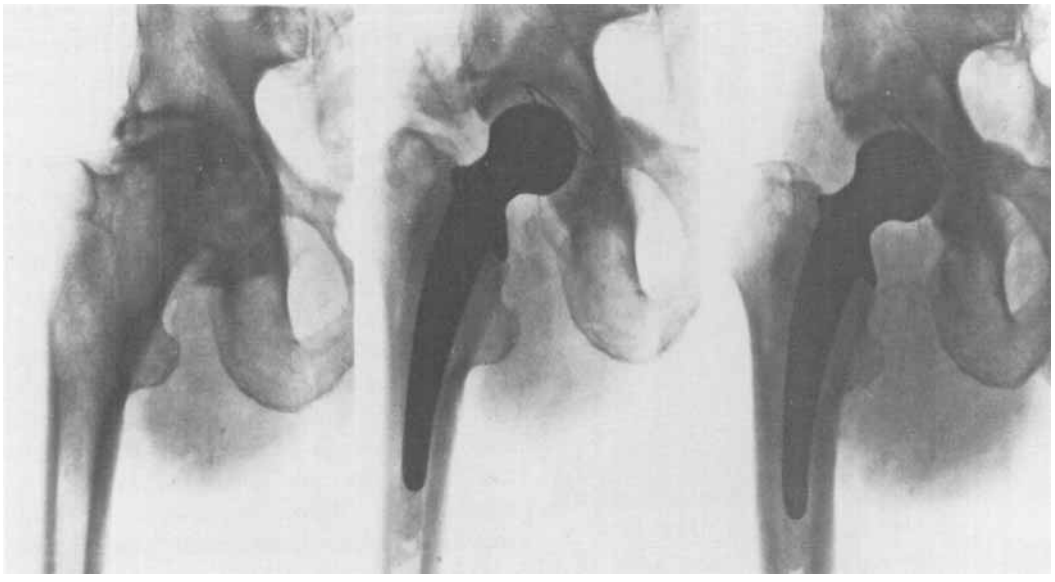

Fig. 1a Fig. 1b Fig. 1c

Figure 1. (a) Osteoarthritis of the hip joint in a man of 60 years. (b) Three months after total hip replacement with a McKee-Arden prosthesis. Para-articular ossification surrounds the hip joint which is almost completely stiff. (c) Nine months after excision of the ossification and free fat transplantation. The result of treatment was classified as good after a follow-up of 2 years.

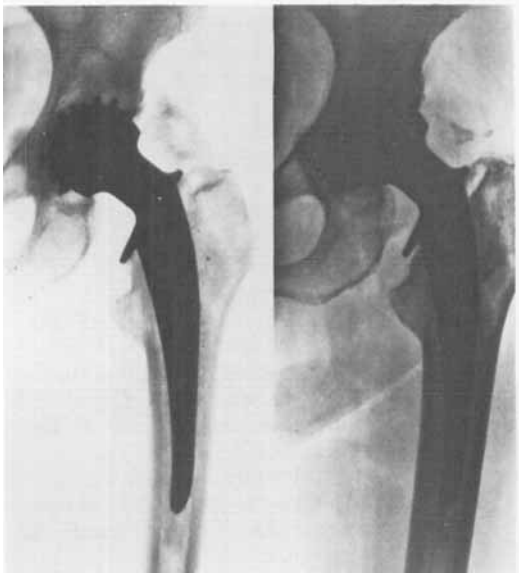

Fig. 2a Fig. 2b

Figure 2. (a) Para-articular ossification 45 days after McKee-Farrar total hip replacement in a woman of 59 years. (b) Four years after excision and free fat transplantation. The result of treatment was classified as excellent with a normal range of movement of the hip joint.

Follow-up

The follow-up period after the second operation varied from 2 to 8 years (Table 2). One patient died of a heart infarction 3 years after the second surgical intervention.

RESULTS

The result of treatment was classified as *excellent,* if a good range of movement of the hip joint was achieved and no recurrence of ossification appeared; and as *good,* if a good range of movement was achieved but an insignificant amount of ossified tissue was noted at the follow-up examination. Fair or

Fig. 3a

Fig. 3b

Figure 3. (a) Para-articular ossification in a woman of 52 years, 9 months after a McKee-Farrar total hip replacement because of fracture of an anchylotic hip joint (b) Three years after excision and free fat transplantation. The result of treatment was excellent.

poor results were not encountered in this series of patients.

A good range of movement of the hip joint was regained in all cases. At the follow-up examination no disturbing para-articular ossification was noted, as illustrated in Figures 1, 2 and 3.

A late infection appeared in one patient 2 years after the second operation. *Staphylococcus epidermidis* was cultured and antimicrobial therapy was indicated.

DISCUSSION

According to Somerville (personal communication, 1973) acrylic cement has been used with good results for the packing of bone surfaces after excision of ossified tissue around the hip joint.

In the present report the actual number of patients was small; seven cases out of 468 developed para-articular ossification after total hip replacement, and in six operated cases the results of this treatment were good. There was no recurrence of the ossification, and a good range of movement of the hip joint was maintained.

Apart from this, there have so far been no reports of successful methods of treatment for para-articular ossification. It may be possible to prevent it by skilful surgical techniques but, nevertheless, there will always be some patients who develop ossified tissue around the hip joint, after replacement procedures, without there being a known reason. In these cases excision and free fat transplantation are indicated. Enough fat tissue should be taken to fill up the gap after excision of the calcification. There is always sufficient abdominal subcutaneous tissue even in men.

During the past few years, free fat transplants have been utilized in our clinic in many instances to prevent scar tissue formation: in myositis ossificans, in plastic surgery operations, in connection with antero-lateral decompression of the spinal cord, and to produce artificial pseudarthroses. The results in these cases have also been encouraging.

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