



## Section of Orthopaedics

President T J Fairbank FRCS

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### Cases

#### Total Replacement Arthroplasty of the Elbow Joint for Rheumatoid Arthritis: Two Cases

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Painful instability or ankylosis of the elbow joint are not infrequent complications of severe rheumatoid arthritis. The loss of function is especially distressing for a patient already handicapped in other joints. Since the results of reconstructive surgical procedures commonly used for this problem are uncertain (Dee 1969), a recently developed prosthesis is currently undergoing a closed clinical trial.

The prosthesis consists of a chrome cobalt hinge joint cast in two sections and articulated at operation. The single axis pin has one end flared at manufacture and is retained by flaring the other end with a specially designed G-clamp after articulation. Prior to insertion, the humerus is sectioned just above the olecranon fossa and the trochlear notch of the ulnar is fashioned into a flat platform. Both sections of the prosthesis are retained in the bones by the design of the stems and with the aid of acrylic cement.

#### Case 1

Mr W O, aged 53

*History:* This patient with seropositive rheumatoid arthritis had been taking prednisone 10 mg daily for ten years. Previous bilateral McKee arthroplasty of the hip had been entirely successful, but since 1965 he had developed increasing pain in both elbows and shoulders. By November 1968 the right arm was functionally useless due to instability and pain in the right elbow. He is right-handed and could not do his work as an antique restorer. He could neither comb his hair

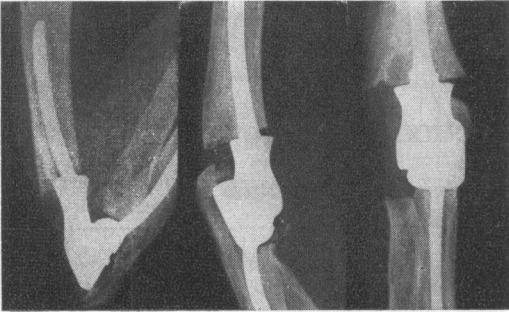
nor clean his teeth with his right hand, and could not even pick up the condiments at table.

*On examination:* There was 15 degrees of collateral instability at the right elbow. Active movement was severely inhibited by pain and impossible against moderate resistance. Although there was a passive range of movement 30–120 degrees, this was accompanied by gross crepitus and extreme discomfort. Pronation and supination were 45 degrees each but these movements were also impossible against resistance due to pain. X-ray showed severe destructive rheumatoid arthritis (Fig 1).



Fig 1 Case 1 Pre-operative X-ray showing severe involvement of the right elbow joint with rheumatoid arthritis

*Operation (7.5.69):* The right elbow joint was totally replaced. The radial head was excised and the ulnar nerve transplanted anteriorly which is a routine part of this procedure. Post-operatively he wore a plaster of paris cylinder to the right elbow for three weeks. The arm was then left free and he mobilized the new joint without physiotherapy.



**Fig 2 Case 1 (21.8.69)** *The prosthesis in situ. Almost full restoration of movement*

Although movement had been almost completely restored and he was pain-free and using the arm well by the first week in June, X-ray at this time showed that the axis pin had started to extrude from the joint. He was readmitted and the axis pin was replaced in position through two small incisions. It was seen that due to a technical error at the first operation in the application of the G-clamp, the axis pin had been inadequately flared. This was corrected, the skin closed and he was allowed to mobilize on the first post-operative day. He now has a range of movement 15–155 degrees which is pain-free. He also has full pronation and supination. Functionally, his arm has been restored almost to normal (Fig 2).

### Case 2

Mrs J W, aged 49

**History:** This patient who had been taking prednisone 8 mg daily for six years also has rheumatoid arthritis with multiple joint involvement. Her right wrist was arthrodesed in 1959 and a ruptured right thumb extensor repaired a few months later. In February 1968 the right elbow became especially troublesome and she started to lose function in the right arm with symptoms of ulnar neuritis. These became progressively worse and she found herself unable to use the right arm for such tasks as feeding herself, doing her hair or washing her face. She is right-handed.

In the second half of 1968 she also developed a large bursa which was related to subluxation of the right radial head. At this time she was using the right arm hardly at all and doing most of her everyday tasks with the left.

**On examination:** There was 30 degrees of collateral instability and a large bursa related to the right radial head. Passive pronation and supination were full, as were flexion and extension. However, loading the elbow joint in any way caused complete loss of power in the joint due to reflex inhibition. She experienced severe pain on attempting any active movement against resist-

ance. Even when no resistance was offered to extension and flexion of the elbow joint, active movement was accompanied by severe discomfort and gross crepitus. X-ray showed gross destruction of the elbow joint with anterior subluxation of the radial head (Fig 3).

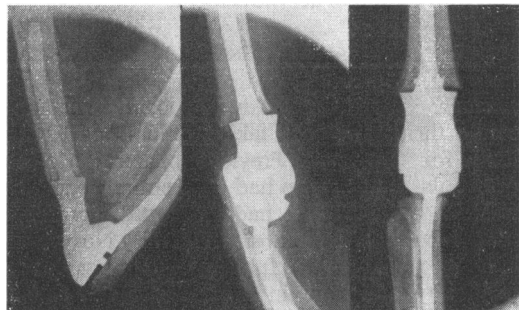
**Operation (29.5.69):** The right elbow joint was replaced using the Middlesex Hospital prosthesis. The large bursa (which was a diverticulum from the main joint cavity) was excised, together with the radial head, and the ulnar nerve was transplanted anteriorly. Post-operative treatment consisted of a plaster of paris cylinder to the elbow joint for three weeks, after which the patient mobilized the new joint herself. No physiotherapy was ordered. She now has a full range of flexion-extension and pronation-supination (Fig 4), and excellent power. The ulnar neuritis has disappeared.

### Comment

The initial results reported here are sufficiently encouraging to continue the clinical trial without any modification to the prosthesis. Although specifically designed for use in patients with



**Fig 3 Case 2 Pre-operative X-ray showing anterior subluxation of the radial head and the soft tissue shadow of the associated bursa**



**Fig 4 Case 2 (14.8.69)** *Full movement has been restored*

rheumatoid arthritis affecting the elbow joint it would appear to have application in patients who have developed ankylosis after trauma. The necessity to retain the olecranon ensures that no portion of the prosthesis is subcutaneous but would clearly impose some limitations on its use after trauma.

#### REFERENCE

Dec R (1969) *Proc. roy. Soc. Med.* 62, 1031

### Childhood Sciatic Palsies: Congenital and Traumatic

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Isolated lesions of the sciatic nerve are rare in childhood but good functional recovery can be expected (Clawson & Seddon 1960). Our first case due to a developmental anomaly is perhaps unique; the second illustrates recovery from gross trauma.

#### Case 1

Girl, born 9.9.66

*History:* Full term normal delivery. At 3 months the mother had noticed progressive enlargement of the left buttock and that the left leg was smaller, cooler and moved less than the right. Presented at our clinic aged 9 months.

*On examination:* Left paralytic talipes equinovarus with a tight tendo achillis was associated with soft tissue swelling of the left buttock. The left leg was cool with no evidence of sensation below the knee.

*X-rays* (Fig 1): A bony excrescence was seen arising from the left iliac bone with an epiphysis adjacent to its upper point. A further bony shadow was present above the left hip joint and the upper left femoral epiphysis was smaller than the right. A poorly developed acetabular roof had allowed the hip to sublux.

*Management:* Lengthening of the tendo achillis and plantar fasciotomy were performed, the hips being abducted in a Denis Browne splint. The left hip proceeded to develop normally but the bony mass continued to enlarge. Over three months there was no change in the neurological signs and therefore the left buttock was explored. A pedunculated mass of bone and cartilage sur-

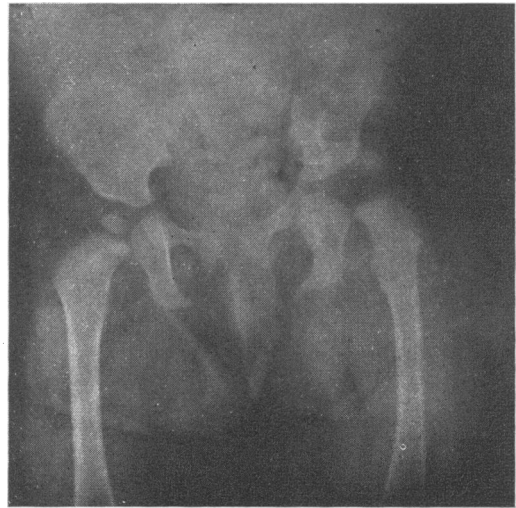


Fig 1 Case 1 X-ray at 10 months

rounded by connective tissue was found growing from the ileum and through the sciatic notch. It articulated with the posterior rim of the acetabulum, and immediately distal to this further cartilage was embedded in the joint capsule. At the sciatic notch the nerve was stretched across the mass and thinned to 1–2 mm (Fig 2). The mass was excised and histology showed bone and cartilage of normal structure containing red bone marrow.

Abduction splintage was retained for six weeks and the acetabulum proceeded to develop normally. The circulation improved within a month of operation. Progressive neurological recovery ensued, and by 17 months post-operatively the child was walking with a below-knee caliper, lacking only ankle and toe extensors. Recently, two years after the buttock exploration, the tibialis posterior tendon has been transferred to

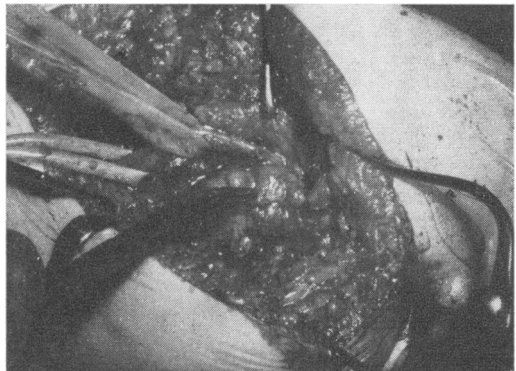


Fig 2 Case 1 Sciatic nerve displaced laterally to show mass growing through sciatic notch