

AN ORTHOSIS FOR A PATIENT WITH A FAILED TOTAL HIP-PROSTHESIS

by Tim Jacobson, B.S., C.O.¹
Alanson Mason, M.D.²

This paper describes the orthotic treatment of an elderly female who lacked a proximal section of the femur and the hip joint on the left side.

Patient History

Recently, a 65-year-old Caucasian female with diabetes was seen who had a chronic, recurring problem with her left hip and thigh for the past four years. Initially, she suffered an injury to the left hip that developed into degenerative osteo-arthritis of the hip joint. A total hip replacement of the Charnley-Muller type was provided.

She did well for a period of nearly two years until she fell at work and suffered a complex comminuted fracture of the femur below the stem of the femoral prosthesis which required hospitalization and treatment involving traction. The fracture failed to unite, and an intramedullary rod was inserted in the femur alongside of the stem of the prosthesis. Acrylic cement was used to provide additional fixation.

The fracture failed to unite, and the rod was removed several months later. Osteoporosis of the proximal femur made it extremely difficult technically to provide ade-

quate immobilization. However, a new prosthesis was inserted.

Ultimately, the prosthesis was removed and a new, custom-made prosthesis with an extremely long stem was provided (Fig. 1) approximately one and one-half years ago. The patient did well for a time but gradually developed increasing evidence of deep abscess formation and drainage. After repeated incision and drainage of recurring abscesses in the left thigh and prolonged antibiotic therapy over a period of a year, it was concluded that the prosthesis would have to be removed before additional treatment could be rendered (Fig. 2).

Goals and Treatment

It was decided to provide this patient with an external orthotic appliance to allow her to become ambulatory and as functional as possible.

Following the removal of the final hip prosthesis, skeletal traction was applied to the proximal tibia, to assist in maintaining leg length. The affected limb measured 6 cm. shorter than the sound side, at the time that orthotic treatment was initiated. The patient



Fig. 1. X-rays showing the final hip prosthesis that was attempted.

was not obese, and seemed highly motivated.

The design of the orthosis consisted of an ischial weight-bearing, adjustable, plastic, total-contact quadrilateral thigh section, which was to be attached to a knee-ankle-foot orthosis with offset, drop-lock knee joints, free ankle joints and an external prosthetic above-knee hip joint with a leather pelvic band (Figs. 3, 4). A cast was taken, using a polyethylene quadrilateral brim, extending well over the femoral epicondyles. Approximately 15 pounds of distraction were applied to her affected limb during the casting to increase thigh length.

After the plaster had set, a tracing and

measurements were taken of the entire limb and hip.

Fabrication

The thigh section was modified and tension values established similar to the above-knee total-contact standards taught at Northwestern University. The anterior-posterior dimension (ischium to adductor longus tendon) was reduced considerably because the adductor longus was only partially intact.

The quadrilateral socket was fabricated in two sections. The posterior two-thirds was an 80 percent rigid—20 percent flexible polyester resin laminated over a previously vacuum-formed polypropylene anterior shell. The anterior piece was attached laterally by three Dacron hinges. Velcro fasteners made the anterior-posterior dimension adjustable

Fig. 2. X-rays of hip region following removal of the final hip prosthesis.



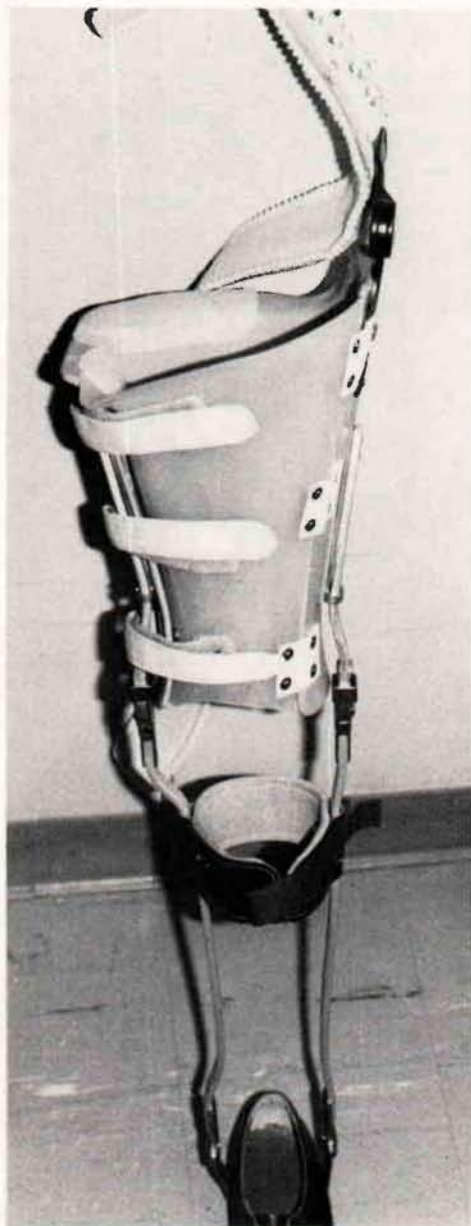


Fig. 3. Anterior view of the orthosis.

to insure a proper placement of the ischium on the seat. An above-knee extension adjustment was incorporated in the system.

The external prosthetic hip joint placement was not critical since there was no anatomical hip joint present. The pelvic band

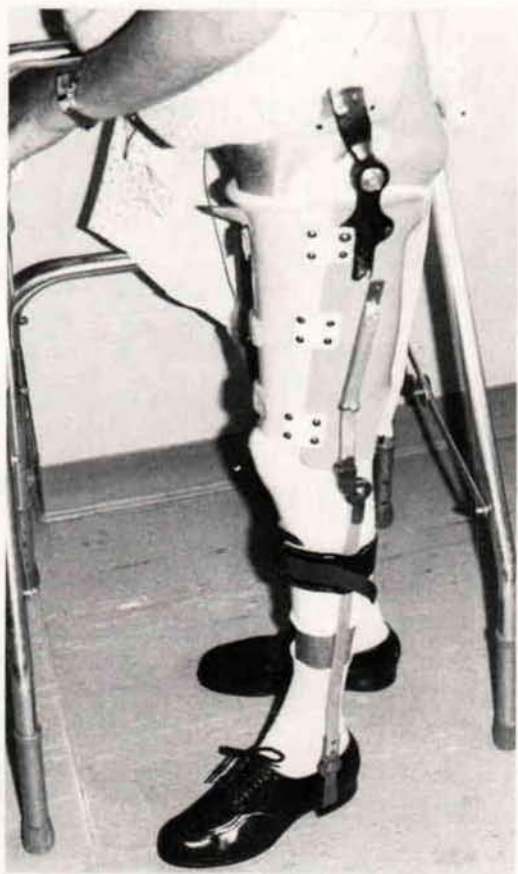


Fig. 4. Lateral view of the patient bearing weight in orthosis.

was placed high on the ilium to create a long lever arm from the hip joint axis.

Results

After two days of familiarizing herself with the orthosis, the patient was able to negotiate stairs in physical therapy with the aid of forearm crutches. She was discharged within a week after receiving her appliance.

The patient has used the orthosis for four months in carrying out normal daily activities which include driving an automobile and doing her own shopping. She wears a fracture cast sock on her limb for comfort. Virtually no adjustments to her orthosis have been necessary to date.

The medical opinion for this patient is that no further reconstructive surgery be done as it is not necessary or possible. The infection is under control, and adequate pain relief has been achieved.

Considering the number of total hip surgeries currently being performed, it is logical to conclude that serious problems will develop from time to time.

The orthotic system described in this paper was successful, and it effectively prevented deformities of the limb frequently as-

sociated with hip reconstructive arthroplasty procedures. The orthosis provides a functional, stable, pain-free joint, and would be applicable to many postsurgical problems that do arise. This orthosis might also be applicable for stabilization of the limb following removal of a segment of the femur secondary to infection or carcinoma.

Footnotes

1 Clinical Orthotist, Orthomedics, Inc., North Hollywood, Ca.

2 Orthopedic Surgeon, Glendale, Ca.