SUPRACONDYLAR FRACTURE OF THE FEMUR AS A COMPLICATION OF THE PATELLAR TENDON BEARING CAST: A CASE REPORT

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ABSTRACT: This article presents the history of a 19-year-old man who underwent treatment for a compound fracture of the left tibia and fibula. While weight bearing in a patellar tendon bearing cast, the patient sustained a supracondylar fracture of the left femur. This particular complication was unreported previously and perhaps could be avoided in similar cases by stricter adherence to the principles of early weight bearing as outlined by Sarmiento and others.

Introduction

The patellar tendon bearing case as described by Sarmiento has become an accepted means of ambulatory treatment for patients with tibial fractures. This report describes a previously unreported complication of this kind of cast, incurred by a patient undergoing treatment for a compound fracture of the tibia.

Case Report

A 19-year-old man was seen first in the outpatient clinic of the Kaiser Foundation Hospital on September 12. On September 2 he had been involved in a dune buggy accident in which he sustained a compound, comminuted fracture of the proximal left tibia and fibula. He was seen initially at a community hospital in California, where he was treated by immediate debridement, fixation of the fracture with multiple Kirschner wires, closure of the skin wound, and application of a long leg cast. Antibiotic therapy was prescribed for three weeks, and the leg was kept non-weight bearing with crutches. At the time of the patient’s initial visit to Kaiser Hospital the cast was intact, he was having no problems, and no change in the treatment was instituted.

Thirty-eight days after injury, the sutures and three of the Kirschner wires were removed. At that time the fracture was felt to be unstable, and a new long leg cast was applied. The patient continued to use crutches, and six weeks later he was admitted to the hospital for removal of the remaining Kirschner wire. As there was considerable motion at the fracture site, a new long leg cast was applied. The patient continued to be non-weight bearing with the aid of crutches. At a subsequent visit to the outpatient clinic six weeks later (12 weeks after injury), there was no evidence of either clinical or radiologic union of the fracture.

On March 7, six months after the original injury, the examining physician noted gross motion of the tibia, despite evident union of the fibula (Figs. 1A, 1B). A patellar tendon bearing cast was applied, and the patient was instructed to remain partial weight bearing with crutches. Three weeks later there was a mild increase in posterior angulation, and the cast was wedged.

On the evening of April 30 the patient slipped on a curb and landed abruptly on his flexed left leg. When seen in the Emergency Room at the Kaiser Hospital, he was found to have a supracondylar fracture of the left femur at the level of the proximal portion of the cast (Fig. 2).

After intravenous sedation the fracture was reduced, and the leg was placed in a Thomas splint with a Pearson attachment. A long leg cast was applied five days later and the patient was discharged, non-weight bearing, on crutches.

The femur healed over a period of four months, and in September the patient was admitted to the hospital for bone grafting of the tibial nonunion and a fibular osteotomy. When the patient was seen last, in December, the tibia was felt to be clinically solid, and there was radiologic evidence of incorporation of the bone grafts.

Discussion

Dehne and others have advocated ambulatory treatment of both closed and open tibial fractures. As an extension of this trend, Sarmiento described and employed the patellar tendon bearing (PTB) cast and brace. The advantages of the cast are: Soft tissue atrophy is virtually eliminated; knee motion is preserved; edema is kept to a minimum; union rate is very high (only two nonunions were reported in 1974); angulatory deformities are small; the average healing time is short when compared with other forms of treatment; and osteoporosis is minimized. Complications are rare.

In the case presented here, it should be noted that the patient was maintained in a long leg cast for six months following his initial injury. During this period of time, his treating physicians did not allow him to bear weight. In general we apply a long leg cast for

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Figs. 1A, 1B: AP and lateral views of the tibia show the fracture prior to application of the patellar tendon bearing cast.
approximately six weeks, as advocated by Brown. Depending upon the stability of the fracture and the adequacy of reduction, we may suggest that the patient begin weight bearing in the long leg cast as early as two weeks after injury. Following this initial treatment we apply a patellar tendon weight bearing cast, after which ambulation with partial to full weight bearing is allowed. The PTB is worn until radiographic and clinical union are evident.

A number of factors could have been involved in the complication reported. It is possible that prolonged nonambulatory treatment in our patient resulted in loss of bone parenchyma and weakness of the femur, although this was not evident radiologically. It is well known that there is a loss of muscle tone in patients who have sustained fractures and have worn casts for prolonged periods. The loss of this muscle mass could certainly result in decreased support for the femur. It is most likely, however, that bone atrophy combined with a second insult to the limb produced the fracture described.

We have found the PTB cast a useful adjunct to our treatment of tibial fractures. We have also employed it in the early treatment of ankle fractures, and following bone grafting of the tibia for nonunion. The complication we describe is certainly unusual, and perhaps could be prevented in similar cases by adhering to the principles of earlier weight bearing and earlier application of the Sarmiento cast.

References