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To cite this article: Giovanni Zatti, Fabio D'Angelo & Alberto Giughello (2000) Delayed diagnosis and treatment of Tillaux fracture--a case report, Acta Orthopaedica Scandinavica, 71:3, 327-329, DOI: [10.1080/000164700317411997](https://doi.org/10.1080/000164700317411997)

To link to this article: <https://doi.org/10.1080/000164700317411997>



Published online: 08 Jul 2009.



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(Shinmei et al. 1995). Shinmei et al. (1995) reported that the mean (SE) and median values of chondrocalcin in joint fluids of osteoarthritis (94 cases), rheumatoid arthritis (141 cases), and traumatic arthritis (30 cases) groups were 4.9 (4.71), 1.1 (0.1), and 2.1 (2.0) ng/mL, respectively. The mean chondrocalcin value of normal joint fluids drawn by the injection of physiological saline from 15 healthy controls was 0.3 (0.1) ng/mL.

Since the degree of cartilage erosion was mild in our case, we conclude that the increased level of chondrocalcin reflected an increased synthesis of type II collagen in synovium caused by synovial chondromatosis. Estimates of chondrocalcin in joint fluid may be useful for diagnosing synovial chondromatosis.

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Delayed diagnosis and treatment of Tillaux fracture—a case report

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Submitted 99-09-07. Accepted 99-11-22

A 14-year-old boy injured his left ankle while playing football at school and was brought to the local hospital, where anteroposterior and lateral roentgenograms were taken (Figure 1). The physician in the Emergency Department diagnosed an infraction of the lateral malleolus and a short leg cast was applied for 30 days.

After the cast was removed the patient continued to complain of ankle pain during walking and joint movements. He was referred to our department where new radiographs showed a Salter Harris type III injury of the lateral portion of the distal tibial physis (Salter and Harris 1963). Reexamination of the first radiographs showed a Tillaux frac-

ture with widening of the tibiofibular mortise. A CT scan confirmed this diagnosis and also showed a rotational displacement of the fragment (Figure 2).

5 weeks after the injury, the fracture was exposed through a small anterolateral incision. The tibiofibular mortise appeared widened and unstable and the bone was soft. The displaced fragment was cleaned respecting the intact anterior tibiofibular ligament. The original site was cleaned with a curette; the fragment was reduced and fixed with a 3.5-mm cancellous screw to the intact epiphysis.

The boy was discharged from hospital after 3 days with the ankle free and he was told not to



Figure 1. At the time of trauma. A typical Tillaux fracture, but missed initially.



Figure 2. CT shows displacement of the fragment.

bear weight in the first month. Afterwards, progressive weight bearing was allowed. The fracture was judged healed after 3 months when he resumed sports. The screw was removed after 1 year.

At the most recent follow-up 27 months after surgery, the boy had no symptoms or loss of ankle function and normal motion.

Discussion

Tillaux fractures are relatively uncommon Salter-Harris III fractures of the distal tibia (Kleiger and Mankin 1969). The largest series is that of Dias and Giegerich (1983) who described 9 cases. The



Figure 3. 13 months after surgery. No signs of avascular necrosis of the fragment which is anatomically reduced.

treatment was closed in 5 cases with minimal displacement and surgical in the remaining 4 with a severe displacement.

The mechanism of this juvenile fracture is well known; the keystone is the peculiar closure pattern of the distal tibial physis, which makes the lateral corner a weakened portion for a period of 18 months until complete closure occurs (Rang 1974). Injuries with the foot in external rotation and extension lead to avulsion of this physeal portion, due to excessive tension of the tibio-fibular ligament.

In displacements exceeding 2 mm with a rotation of the fragment, open reduction and internal fixation have been suggested to obtain articular congruence (Stefanich and Lozman 1986, Mariani and Perrone 1998). Schlesinger and Wedge (1993) described percutaneous fixation of the displaced fragment.

As to our patient, we were concerned about the quality of bone in the dislocated fragment, hence the possibility of obtaining good osteosynthesis with an anatomical reduction. The fragment was

moderately porotic, but reduction and stable synthesis were possible.

Another risk that had to be taken into account was avascular necrosis (AVN) of the fragment, which is theoretically increased by a delayed diagnosis and treatment. We found no sign of necrosis when we removed the screw and at the final follow-up, the boy had no symptoms.

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Fibrosarcoma at the site of a metallic fixation of the tibia—a case report and literature review

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Submitted 99-07-22. Accepted 00-01-10

A 58-year-old man who was seen in April 1996 complained of pain and swelling along the medial aspect of the left calf for 4 days after a fall. 30 years earlier, his left tibia had been plated after a fracture. The patient had had no symptoms up till then. Radiographs showed a well-healed fracture of the tibia, with a plate and 4 screws (Figure 1). A hematoma was diagnosed. The discomfort gradually increased. 1 week later, an open drainage incision was made. A culture for bacteria revealed no growth and the wound healed per primum.

2 months later, the swelling persisted and we thought it was due to the presence of the plate and

screws. Therefore, we decided that these should be removed and a biopsy performed. There was no sign of macroscopic corrosion of the stainless steel implant. The pathologist reported that the soft tissue specimen consisted of fibrous tissue and old bleeding, without neoplastic cells. The benign diagnosis was confirmed at reexamination. The patient was discharged from hospital.

He was readmitted to hospital 9 months later with a tumor of about 5 cm in diameter having necrotic areas and a malignant appearance at the site of the previous scar (Figure 2). MRI showed a tumor in contact with the skin, but we were not told