Case report

The runaway nail
Unusual complications of using a self-lengthening intramedullary nail for aesthetic reasons

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1. Introduction

Bone lengthening was reported as early as 1905 by Codivilla, but differed completely from the modern philosophy of distraction osteogenesis [2]. Within the last few years, distraction osteogenesis has become an established method for limb lengthening and for the treatment of large bone defects and non-unions. The classical fixator device used for these procedures is the ring-fixator of Ilizarov [4]. To reduce the time in an external fixator and to overcome the potential serious complications of prolonged use of an external fixator, advantageous alternatives were developed such as the fully implanted intramedullary distraction nails (Albizzia nail, Fitbone programmable motorised distraction

Fig. 1. (a) Frontal view of the sudden distraction of the femur. (b) Lateral view after sudden distraction of the femur.
nail and the Intramedullary Skeletal Kinetic Distractor (ISKD) nail). With the Albizzia nail and the ISKD nail, lengthening takes place mechanically by the patient himself.

2. Case report

An ISKD nail (ISKD Orthofix, McKenny, TX) [3] was placed in the right femur after performing an open osteotomy at the junction between the middle and proximal third of the femur.

Two days after surgery, the patient was allowed to go home. However, over the course of the following 3 days he experienced severe pain in his thigh with increasing numbness of the whole leg. Radiographs showed an unwanted lengthening of 4 cm (Fig. 1). The patient was admitted to the hospital for urgent removal of the distal screws and acute shortening of his femur. The ISKD nail was locked again at his distal part in the new position (Fig. 2). Bone healing occurred uneventfully but numbness in his leg remained for 1 year (Fig. 3).

3. Discussion

To our knowledge, this “runaway” nail complication was first reported by Erik N. Kubiak in 2005 (OTA 2005-Boston, poster session). The authors retrospectively reviewed 10 patients with 11 limbs that had undergone placement of an ISKD nail for limb lengthening. Complications were encountered in 60%. Two patients’ ISKD nails underwent full distraction at 1 week of 3.0 and 3.2 cm, respectively. Other authors also reported that the device did not allow for precise control of the rate of distraction [1].

In our case of sudden lengthening of 4 cm in 5 days, severe pain and numbness of his entire leg was noticed from the third post-operative day. It is likely that the clutch mechanism in these nails is, in some cases, too sensitive (they are activated at 3° rotation) and can be activated by physiological movements or muscle contractions.

Fig. 2. Radiograph after removal of the original screws and shortening of the femur with relocking of the nail.

Patients must be able and willing to comply with the post-operative instructions, including lengthening exercises and use of the monitor.

When using this device, careful patient selection and follow-up is warranted to prevent this potential serious complication.

Fig. 3. (a) Frontal radiograph 12 months after the incident showing sound bone healing. (b) Lateral radiograph 12 months after the incident with good bone healing.
References


