

R. Rossi
M. Germano
F. Castoldi

Migration of a Kirschner wire from the greater trochanter to the popliteal fossa: a case report

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R. Rossi (✉) • M. Germano • F. Castoldi
Medical School University of Turin
Umberto I Mauriziano Hospital
Turin, Italy
E-mail: rossir@fastwebnet.it

Abstract Migration of Kirschner (K) wires from the upper extremity joints has often been reported, but it is less common from the lower extremities. In this report, we describe an 85-year-old man treated, during a hip replacement procedure, with a K-wire because of a trochanteric fracture; after one year, the K-wire was found in the

popliteal fossa. This report illustrates the first case of K-wire migration in the popliteal area of the knee and suggests avoiding the use of free K-wires without any tension banding.

Key words Kirschner wire • Knee • Hip replacement

Introduction

Kirschner (K) wires and Steinmann pins are often used by orthopaedic surgeons in the management of fractures and dislocations. Migration of K-wires has been commonly described [1–3]. However, most previous reports have described the migration of a K-wire from the shoulder joint, due to proximity of the thorax [3]. To our knowledge, no reports have described K-wire migration from the lower limb, especially since K-wire fixation of fractures and dislocations of the lower extremity joints is an uncommon procedure. We describe the case of a patient treated with a K-wire for a trochanteric fracture and in whom, one year later, the wire was found in the popliteal area.

Case report

An 85-year-old man was accepted to the emergency department with the suspect of hip fracture due to a fall. A basicervical hip fracture of the right proximal femur was diagnosed. The day after, the patient was treated using a

cemented endoprosthesis: during the reducing procedure, after the cemented timing, the first surgeon observed a fracture around the greater trochanter (extending from the trochanteric area to the metaphysis of the femur). An internal fixation between the greater and lesser trochanters was performed using a K-wire. Standard radiographs were obtained.

On the second postoperative day, the patient walked with two crutches, with no relevant symptoms. He was admitted to the rehabilitation department on the sixth postoperative day and was discharged five days later. During the clinical visits after 30 days, 3 months, and 6 months the patient showed improvement in walking without crutches and had no pain.

At the 1-year follow-up, the patient started to have some discomfort in the homolateral knee. He reported: “When I bend the knee, I feel that something is stinging me”. As a result, standard anteroposterior (AP) and lateral views of the proximal femur were obtained to evaluate the hip prosthesis, but no K-wire was found on the radiographs. Therefore, we obtained an AP pelvic radiograph and a radiograph of the femur. The K-wire was found on the popliteal fossa. During the examination, the orthopaedic surgeon was unable to feel the K-wire with his finger. Ultrasonography of the popliteal fossa



Fig. 1 Anteroposterior radiograph showing the hip endoprosthesis and the K-wire



Fig. 2 Anteroposterior (a) and lateral (b) radiographs of the knee at the 1-year follow-up show the migrated K-wire

revealed that the wire was in the posteromedial side of the knee.

Two days later the K-wire was removed: it was found surgically between the semimembranosus and the semitendinosus muscles. The patient was completely asymptomatic after the operation.

Discussion

K-wires and Steinmann pins are often used to achieve internal or external (percutaneous) fixation of fractures and to obtain an immediate fixation of unstable fractures or osteotomies. When a *free* K-wire is used, the patient



Fig. 3 Intraoperative view: the K-wire was found in the popliteal fossa

must be followed both clinically and radiologically until the conclusion of treatment, at which time all pins should be removed. The migration of K-wires has been described in the upper [4] and also in the lower [5] extremities. In the upper limb, K-wires are used frequently for percutaneous, temporary internal fixation and are usually threaded. However, in the lower extremity, K-wires are used for tension band wiring [6]. Some reports have described wire migration from the hip to the heart [7, 8], lung [9] or abdomen [10] after osteosynthesis at the hip joint or after hip replacement. In one case, the migration occurred after a greater trochanteric osteotomy and caused sciatica [11].

In the present case, a fracture of the greater trochanter was observed after cemented fixation of the prosthesis. For this reason, a smooth (not curved) K-wire was fixed in a surface bone-cement-bone to reduce the fracture, without any tension banding.

Various theories of K-wire and Steinmann pin migration have been proposed, including gravitational forces and muscular activity. In this case, migration was possible because the smooth K-wire (not curved and without any tension banding stimulated by ileopsoas activity), followed the bed between the semimembranosus and semitendinosus muscles, near the posterior side of the knee, where the area is smaller due to the overlap of the two tendons.

As already emphasized [12], K-wires have to be removed as a matter of urgency, regardless of the lack of symptoms, because delayed complications (vascular and neurological) may be sudden and, in some cases, fatal. In summary, we and others [13] suggest avoiding free K-wire in the lower limb without any tension banding.

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