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The Department of Orthopaedics and Traumatology, Colentina Hospital, Bucharest, Romania.

RECURRENT LUXATION OF THE SUPERIOR TIBIO-FIBULAR JOINT IN THE ADULT

Cl. C. Baciu, Al. Tudor & I. Olaru

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Recurrent luxation of the superior tibio-fibular joint has been detected very rarely and its existence is not mentioned in the classical speciality treatises or monographs on the knee. Information is actually to be found in only two articles. In the first, published by Dennis & Rutledge (1958), the authors report a case of posterior bilateral recurrent luxation, subsequently complicated by palsy of the external popliteal sciatic nerve, in a 27-year-old subject. The second paper, published by Owen (1968), refers to two young girls, aged 15 and 16, with antero-external recurrent tibio-fibular luxations.

CASE REPORT

Our patient, aged 45, was a miner and had practised his profession for 23 years. Worthy of note in his past history was chronic polyarticular rheumatism. Of late, without having suffered any trauma, the patient began to complain of increasing pain on the external aspect of his left knee and at the same time a certain lack of stability, his knee "letting him down" and sometimes even making a "snapping sound". The pains and the lack of stability appeared on walking and disappeared at rest. In order to ease the pain he bent his knee slightly and used a walking stick for four months.

The clinical and radiological examination revealed, however, an intact femoro-tibio-fibular joint (Figure 1), and no objective symptoms of lesion of the external meniscus were found. On the other hand, evidence was found of a particular symptomatology, that of pains induced by deeper palpation of the anterior area of the head of the fibula and a positive Rădulescu sign (Rădulescu & Baciu 1965). The Rădulescu sign resembles that described by Appley (1947) in lesions of the meniscus: the patient in ventral decubitus, the leg bent at the knee at an angle of 90°; with one hand the examiner fixes the thigh, with the other he gets hold of the raised foot and rotates the leg inward. Following this manoeuvre the head of the fibula is dislocated forward and outward (Figure 2). Antero-external luxation of the head of the fibula may also be produced by the following manoeuvre used by us: the patient lies in dorsal decubitus with the knee bent at an angle of 45°;

Figure 1. Radiographic aspects: front and side view of the left knee after the reduction of the luxation.

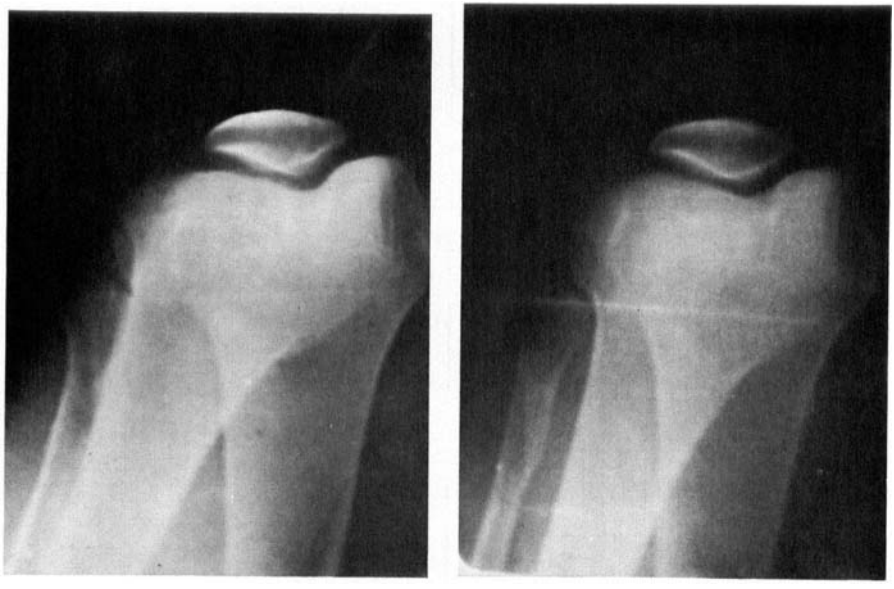

Figure 2a *Figure 2b*

Figure 2. Radiographic aspects: a) Bent knee without luxation; b) Bent knee with luxation (positive Rădulescu sign).

Figure 3. Radiographic aspects: Front view of the left knee with luxation produced by forward and outward traction of the upper extremity of the fibula.

the examiner lays his hand on the leg below the knee; with the thumb on the anterior aspect of the tibia and the four fingers gripping the upper third of the fibula an attempt is made to draw this forward (Figure 3). Luxation can be easily produced by either of these two methods and is not painful when the patient is lying in bed.

On walking normally (without holding the knee slightly bent to avoid pain), luxation occurred spontaneously and was painful as soon as the knee began to bend after the vertical moment, and was reduced spontaneously on extending the knee.

The patient was operated on in October (1970), when a superior tibio-fibular trans-articular arthrodesis was performed using a metallic screw. Extra-periostal resection of 1.5 cm of the fibula (where the upper third joins the middle third) was carried out. Luxation of the head was likewise easily produced intra-operatively, the capsulo-ligamentary apparatus being abnormally lax. A plaster splint was applied post-operatively for 10 days, after which the patient was allowed to take his weight gradually on his foot and to walk.

Examined two years after the operation, the patient declared he no longer had any pains or lack of stability while walking; he could now walk normally without a stick and extend his knee completely (Figure 4).

DISCUSSION

The case reported may be discussed from three points of view, which we consider of interest:

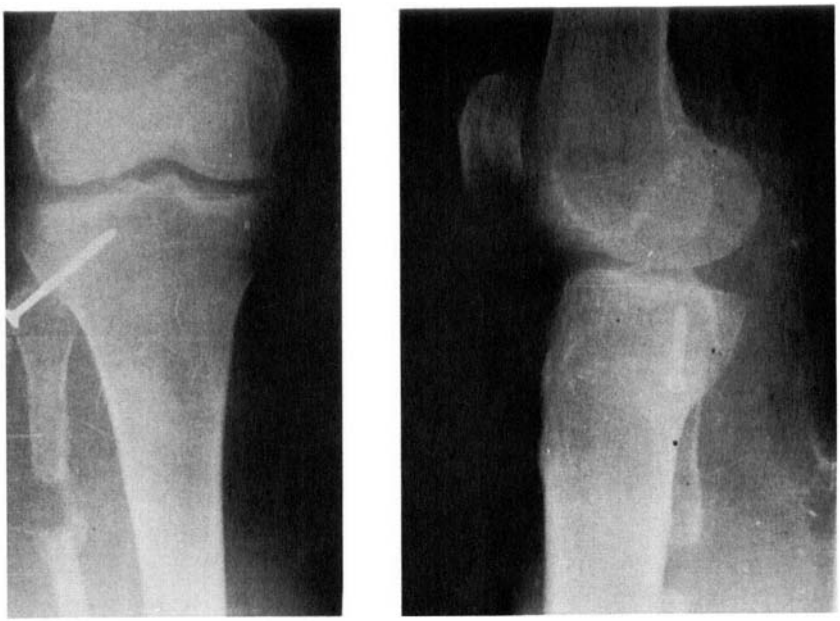

Figure 4. Radiographic aspects two years after surgery.

a) the mechanism of production of the luxation
b) the particular aspect of the symptomatology, and
c) arguments in favour of the therapy adopted by us.

The onset in our case was insidious without any trauma. Our patient exhibited no signs of laxity of the capsulo-ligamentary system in the other joints, it being evident only at the level of the left superior tibio-fibular joint. The cause of this isolated laxity remains obscure. The inclination of the articular surfaces of the affected joint was normal. It is most likely that the condition had an occupational character and was produced by the particular stress exercised upon the articulation during certain characteristic postures of a miner while working. It is certain that luxation occurred spontaneously while walking, when the weight was supported by the left leg, immediately after the vertical moment, and was likewise reduced spontaneously. Luxation was always produced in the same position due to the interaction of the muscular contractions. Before the vertical moment, the hamstrings and especially the crural biceps are under maximum tension in order to maintain extension of the knee that bears the whole weight of the body. The fibular muscles are likewise under tension in order to second the

activity of the anterior tibialis in flexion of the foot on the ground. Being contracted the muscular chain maintains the upper extremity of the fibula in a normal position with respect to the upper extremity of the tibia. Immediately after the vertical moment, under the influence of gravitational forces, the knee is slightly flexed by the weakening of the action of the hamstrings and remains under almost exclusive control of the quadriceps that contract isometrically. On the other hand the contraction force of the fibular muscles increases. The leg which bears the weight acts as a closed cinematic chain; the muscular group of the leg chose a distal fixed point of insertion, at the peripheral ends, towards the supporting base. The fibular muscles act in the same way, drawing the fibula outward and forward and thus producing the luxation.

The symptoms which the patient complained of resemble the symptomatology of lesions of the external meniscus. This similitude with the subjective symptomatology may be misleading, although in lesions of the meniscus the anamnestic data are of the greatest importance. The objective symptomatology is, however, sharply different, the manoeuvres for detecting lesions of the external meniscus being negative, except for Appley's sign, which corresponds with Rădulescu's sign, producing pain and the respective click, not due to clamping of the external meniscus but by producing superior tibio-fibular luxation.

Our therapeutic approach was conditioned by the patient's age. Owen (1968) in his two cases, abstained from operating. The only case of operated recurrent superior tibio-fibular luxation we know of in the literature is that of Dennis & Rutledge (1958). A superior tibio-fibular arthrodesis using a metallic screw was performed. After three months the patient, who was 27 years old, came back with palsy of the fibular nerve. He was reoperated and a few months later came back with deterioration of the arthrodesis and recurrence of the luxation. After some time, broad bilateral resection of the superior extremities of the fibula was carried out. In the first stage, the arthrodesis applied was not sufficient, since operative blocking of the superior tibio-fibular joint also limits the function of the inferior tibio-fibular joint and therefore disturbs the dorsal and plantar flexion of the foot. The resection of the upper extremity of the fibula practised in the second stage of treatment, appears to be closer to a better solution.

The operative technique used by us consists in trans-articular arthrodesis with a metallic screw and the formation of a pseudarthrosis focus at the fibula. The head of the fibula being fixed,

affords the crural biceps a solid point of insertion, and the pseudarthrosis focus permits the distal extremity of the fibula to move independently. The therapeutic results obtained confirmed the use of our new surgical technique, which resembles Sauvé-Kapandji's procedure for badly consolidated fractures of the lower extremity of the radius.

Recognition and adequate treatment of recurrent superior tibiofibular luxation represent an important element of differential diagnosis in the pathology of the knee. It is likely that a certain proportion of arthrotomies in which no lesion of the external meniscus is found may be explained by the existence of an undetected recurrent superior tibio-fibular luxation.

SUMMARY

A rare case of left superior recurrent tibio-fibular luxation which developed insidiously and without any trauma, in a 45-year-old miner, is reported. The case was resolved by trans-articular arthrodesis with a metallic screw and extra-periostal resection of the fibula at the level where the upper third joins the middle third. The mechanism of production of this rare condition and its symptomatology, which may be confused with that of lesions of the external meniscus, are discussed.

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Correspondence to:

Dr. dozent Clement C. Baciu
Orthopaedics and Traumatology Department
Colentina Hospital
Sos. Stefan cel Mare 21
Bucharest II, Romania