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Simultaneous Bilateral Fracture of the Patella of a Cyclist: A Case and the Review of the Literature

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Abstract **Case Report**

Simultaneous bilateral patella fractures with interruption of the extensor device are exceptional especially in a young and sporty patient. A mechanism in two stages, without underlying etiology found, contributes to accentuate the originality of this observation. The authors propose to describe the hypotheses of the mechanism of lesion and the rehabilitative management. The goal is the optimal functional recovery.
Keywords: Bilateral patella fracture; patella.

INTRODUCTION

Patella fractures are rare since they represent less than 1% of all fractures combined. Simultaneous bilateral transverse joint fractures are, therefore, extremely rare (less than 10% of patella fractures); they are also functionally serious because they interrupt the extensor device bilaterally; thus, they prevent walking. The observation that we report illustrates this table and allows detailing the practical support.

OBSERVATIONS

The case is a 43-year-old patient with no notable pathological history. Victim of a sports accident with simultaneous trauma of both knees with the dashboard resulting in pain with total functional impotence of both lower limbs.

The initial examination revealed the presence of a swelling of knees and the perception of a solution of continuity of the two patellas with interfragmentary gap (Figure 1), bilateral patellar shock and a complete deficit of extension of both knees.

X-rays show a transverse fracture of the two patellae associated with a vertical line at the level of the right patella (type I of the Duparc classification on the left, type 2 on the right) (figure 2). The patient was supported by a pinning-guying of both kneecaps (Figure 3), followed by rehabilitation of both knees with strengthening of the quadriceps.

Three months after the accident we note: the existence of a cutaneous conflict with the material (which will require an early removal of the material), subnormal mobilities of the knees, a walk without technical assistance but with claudication; a climb up and down stairs possible.

Fig-1: Clinical Picture of the bilateral fracture of the patella

Fig-2: Front and side X-ray shows the bilateral patella fracture

Fig-3: Radiograph of front and profile shows the fixation of the osteosynthesis guying bilateral fracture of patella

DISCUSSION

The interest of this observation lies in the occurrence of bilateral and simultaneous fractures of the patella in a young man with no antecedent. Two etiopathogenic mechanisms must be retained during a patella fracture: direct trauma, which is the case for our patient and the indirect mechanism.

Direct trauma is the most common mechanism [2]. Due to its subcutaneous location, all transmitted forces are absorbed through the patella at the level of the femoral trochlea with risk of cartilage damage and osteochondral impaction, important depending on the energy of the trauma. It is accompanied by fractures of the base, the tip but also transverse to the middle third of the patella.

The indirect mechanism is rarer. It is an inverted extension of the knee or forced flexion while the quadriceps is contracted [2]. This eccentric brake work reproduces a biomechanical system of three-point bending. The fracture is almost always transverse. Joint cartilage is often poorly damaged. Fractures are most often unilateral because of the alternation of contraction-relaxation phases of the quadriceps during walking.

Carneiro *et al*. [3] describe the occurrence of a bilateral fracture in a marathon runner. While sliding, it perceives a crunch on the right then trying to recover a creak on the left. It evokes a fracture of fatigue.

In the literature, bilateral sine materia fractures are rarely described [4-6]. The direct mechanism is most often exclusive [1, 5]. An indirect mechanism must search for a metabolic pathology (hyperparathyroidism [7], hyperuricemia, dysthyroidism), osteoporosis, an infectious or tumoral process.

Carneiro *et al*. describe the occurrence of simultaneous fracture of both patellae related to a fatigue fracture [3], without the patient having been a victim of prior trauma.

Beyond the etiology and the mechanism, the question of rehabilitation treatment was raised. The re-education project faces the problem of bilaterality and must allow, in a young military subject, top-level sportsman, the most optimal functional recovery possible.

The spindle bracing makes it possible to transform the quadriceps stretching forces into compression-congruence force of the fracture site promoting bone consolidation. Early mobilization of the knee is therefore possible by associating dynamic work in a protected area that depends on the rehabilitation phase [1].

During all phases, the rehabilitation must be based on the main principles of a unilateral attack by adapting to the symmetrical attack. Precautionary principles will be more important because of the bilaterality.

In the initial phase, the goal is to protect the patellar cartilage from undue stress. Biomechanics reminds us that the strength of the patella on the trochlea increases with the amount of flexion (zero in extension, maximum in full flexion). The drainage of trophic disorders is necessary. The gain amplitudes in active helped initially, must allow reaching without forcing 90◦. The muscular reinforcement must allow the locking of the knee. The concentric dynamic work in open, semi-closed and closed chains is introduced. The use of isometric contraction of hamstrings is useful. In our patient, this work proved difficult for a long time because of a conflict with the material.

The relocation of rigid splints by articulated splints is progressive depending on the locking of the knee, respecting the limitations of angular sectors (lower than those requested during the physiotherapy session) under the cover of crutches canes.

The second phase begins on the 45th day. It is necessary to continue an infra-painful gain of the articular amplitudes in active and in passive. Muscular reinforcement is favored by eccentric work of the quadriceps by increasing the permitted angular areas, avoiding the open chain for the quadriceps, unlike hamstrings (where this is allowed).

From a functional point of view, the walk is without a cane with angular sectors limited by the articulated orthosis. The resumption of physical activity is under control from the third postoperative month.

These fractures have great potential for arthrosis [1], especially since the cartilage has been affected during the trauma and the reduction of the fracture is not perfect. This reduction is judged by X-rays, but the CT scan is more efficient.

Conclusion

The simultaneous bilateral traumatic fracture of the patella of the young subject is rare and serious in terms of function requiring adapted and careful support.

References

1. Neyret P. Fractures of the patella (fracture on prosthesis excepted). Teaching notebook SOFCOT. Paris: French Scientific Expansion. 1995: 123-35.
2. Nazarian DG, Booth JR. Extensor mechanism allografts in total knee arthroplasty. Clinical orthopaedics and related research. 1999 Oct (367):123-9.
3. Carneiro M, de Souza Nery CA, Mestriner LA. Bilateral stress fracture of the patellae: a case report. The Knee. 2006 Mar 1;13(2):164-6.
4. Steinke CR. Simultaneous fractures of both patellas. Ann Surg. 1913; 58: 510.
5. Tibone JE, Lombardo SJ. Bilateral fractures of the inferior poles of the patellae in a basketball player. The American journal of sports medicine. 1981 Jul;9(4):215-6.
6. Hensal FR, Nelson T, Pavlov H, Torg JS. Bilateral patellar fractures from indirect trauma. A case report. Clinical orthopaedics and related research. 1983 Sep(178):207-9.
7. Hadlow AT, Medlicott PA. Bilateral simultaneous sleeve fractures of the patella in secondary hyperparathyroidism. Injury. 1987 Nov;18(6):417.