

FLOATING KNEES : CLINICAL FORMS, TREATMENT AND RESULTS. ABOUT 15 CASES

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ABSTRACT

The floating knee is a particular lesional entity described to refer to a fracture of the femur associated with a fracture of at least one of the two bones of the homolateral leg. It is a 38-month retrospective study from June 2008 to September 2011 of patients followed and treated at the Traumatology-Orthopedics Department of the Ibn Sina Hospital in Rabat. We included in our work the consenting floating knee and complete medical record. The incidence of the floating knee is clearly increasing, with an average of 5 cases per year. The 15 patients are 13 men, 2 women; male predominance reaching 85%. The average age is 35 years (between 21 and 61 years). All of our patients are victims of road accidents, including 80% motorcyclists, whose polytrauma rate is 64%. The cutaneous opening is present in 12 patients against 3 completely closed floating knees. External fixation was performed 9 times at the tibia because of frequent and severe skin openings, while internal fixation was frequently performed at the femur. Functional results in our study were excellent or good in 59% of cases; and average or poor in 41% of cases. Osteosynthesis and early rehabilitation are recommended by our authors for a better result.

KEYWORDS: Floating Knee, Polytrauma, Leg, Thigh.

INTRODUCTION

The floating knee is defined as ipsilateral fractures of the tibia and femur, invented by MC BRYDE,^[1] in 1974.

It is an increasingly frequent pathology, given the increase in the number of road accidents, and the mechanism is generally high-energy trauma.^[2]

These fractures are characterized by their difficulty of management and their complications, which can be life-threatening and functional, occurring in specific patients, generally polytraumatized.

Our study is based on the retrospective analysis of the files of 15 patients with a floating knee; follow-up and treatment at the Traumatology-Orthopedics Department of the Ibn Sina Hospital in Rabat, over a period from June 2008 to September 2011.

The aim of this work is to report the clinical forms, types of treatment, we evaluate the functional prognosis in patients and the results obtained.

MATERIALS AND METHODS

We included in our work the consenting floating knee and complete medical records. Fractures were classified

according to Fraser's classification,^[3] treatments and functional results according to Karlström.^[14]

The 15 patients are 13 men, 2 women, average age 35 years (extremes 21 and 61 years); All our patients are victims of road accidents, motorcyclists represent 80% of the cases, with a polytrauma rate of 64%.

The right side is the most affected in 55% of cases.

There are 12 (70%) open floating knees on at least one segment versus 3 (30%) fully closed floating knees.

The percentages of skin opening for femur and tibia fractures are 18% and 47% respectively according to the Gustillo-Anderson classification (Table 1).

Our series includes 60% Type I floating knee according to the Fraser classification, 20% Type IIa, 12% Type IIb, and 8% Type IIc (Table 2).

External fixation was done 9 times at the tibia because of frequent and severe skin openings, while internal fixation was frequently done at the femur. Osteosynthesis by screwed plate for the tibia was performed in 3 patients (20%). Centromedullary nailing was performed in 5 patients (33%).

Table 1: Classification of skin lesions according to Gustillo and Anderson.

| Type | Thigh | Leg | Total |
|-------|-------|-----|-------|
| I | 0 | 3 | 3 |
| II | 0 | 2 | 2 |
| IIIa | 1 | 2 | 3 |
| IIIb | 1 | 1 | 2 |
| IIIc | 1 | 1 | 2 |
| Total | 3 | 9 | 12 |

Table 2: Distribution of Floating Knees by Fraser Classification.

| Type | Type I | Type IIa | Type IIb | Type IIc | Total |
|--------|--------|----------|----------|----------|-------|
| Number | 10 | 3 | 2 | 1 | 15 |

RESULTS AND DISCUSSION

The annual incidence of the floating knee in our department was variable, with an average of 5 cases per year. Statistical figures were not reported in the literature, however, the annual incidence is clearly increasing. This is explained by the increase in the number of road accidents.

Numerous series in the literature show that the incidence is particularly high among young active subjects who are more exposed to traffic accidents. The average age of our series is 35 years with extremes of age ranging from 21 to 61 years. This average is similar to that of 31 years in Pietu.^[4]

The floating knee is the result of a high-energy trauma, the presence of associated injuries is almost constant.^[5]

Clinical signs are pain and functional impotence. These signs have been objectified in 100% of our patients and have been reported by almost all authors. The floating joint is part of a polytraumatized knee, which explains the interest of a systematic examination in search of peripheral injuries and possible vascular-nervous complications, and especially a vital injury.

The cutaneous opening would expose to septic complications and consolidation disorders. These secondary complications are mainly a function of the speed of treatment and the fixation technique used. This shows the value of urgent management.^[6,7]

Vascular lesions are secondary to penetrating trauma; their frequency varies from 4% in our series to 7.2% for Fraser.^[3]

Nerve lesions are rare, absent in our series.

Our series includes 60% Type I floating knee according to Fraser's classification, 20% Type IIa, 12% Type IIb, and 8% Type IIc. The frequency of extra-articular fractures is remarkable in most studies, Fraser,^[3] found 70.7%, Vishal,^[8] reported 58.4%, Eone,^[9] reported 69%.

Nevertheless, Kulkarni,^[10] in his study reported a higher percentage of joint fractures at 58.8%.

Septic or aseptic pseudarthrosis is one of the most serious complications in trauma surgery. This complication, clinically evoked by the pain at the former fracture site with functional impotence of the limb, is confirmed by radiology. The rate of pseudarthrosis in the literature varies between 6.7% in Rethnam et al,^[11] and 31% in Kulkarni et al.^[10] Our series includes 3 cases of pseudarthrosis, i.e. 20%.

In the majority of studies, internal fixation was frequently performed on the femur. Centromedullary nailing was the most commonly used method. The percentages found in our series are consistent with those found by the other authors.

In the tibia, external fixation was performed 9 times because of the frequent and severe skin openings and the complexity of the bone lesions. Vishal's study,^[8] objectively found that the most commonly used method was plate osteosynthesis in 40% of patients. In Kulkarni,^[10] J-C Bel,^[12] and in our series, central medullary nailing was the most commonly used method, with percentages of 36.7%, 44% and 35% respectively.

All the authors confirm that emergency fixation,^[13] reduces cardiovascular complications, eliminates the risk of fat embolism, facilitates nursing, especially for the polytraumatized or polyfractured patient, and reduces the length of hospital stay.

However, the rate of infectious complications varies between 7% for Karlstrom,^[14] and 30% for Fraser.^[3] In our series, the infection rate is low compared to some authors. This is due to the systematic and prolonged use of antibiotic prophylaxis and the absolute rigor of asepsis in bone surgery. However, it is higher compared to others due to surgical treatment of a complex fracture or when the fracture is open.

Functional results are excellent or good in 59% of cases ; and average or poor in 41% of cases. Osteosynthesis and early rehabilitation are recommended by our authors for

a better result in order to avoid complications of pseudoarthrosis, vicious callus and knee rigidity.

CONCLUSION

The floating knee illustrates the difficulties of traumatology and poses specific problems, a global and long-term management of polyfractures, bone sequelae with risk of joint rigidity, which can be reduced with current osteosynthesis means. The high prevalence of open forms would require a new classification that will allow a better legibility of the lesions and treatment, which explains the hypothesis of a classification taking in consideration Fraser and Gustillo-Anderson.

The analysis of all the results confirmed the crucial role of surgery in the treatment of this entity, because of its encouraging results and its multiple advantages.

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