

# Evaluation of the Surgical Treatment of Patella Fractures in 17 Cases in the Orthopedic-Traumatology Department of the University Hospital Center of Donka, Republic of Guinea

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## Abstract

**Objectives:** To determine the epidemiological, therapeutic and evolutionary aspects. **Methodology:** This was a retrospective study, from January 1, 2016 to December 31, 2018, on the files of patients aged 16 and over, admitted for patella fractures, treated surgically and followed up in our service. **Results:** The study involved 17 patients including 15 men (88.24%) and 02 women (11.76%) with an average age of 36.65 years. Workers were the most represented (29.42%); AVP were the leading cause of these fractures (52.94%). The fractures were open in 70.58% of cases. Associated lesions were dominated by femur fractures in 29.42%. Duparc type II was the most encountered bone lesion with 47.06% of cases. All our patients benefited from regional anesthesia. Bracing was the most used surgical treatment in 58.83%; the anterior approach was performed in all our patients. Four (04) cases of knee stiffness, two (02) postoperative infections and skin necrosis complicated the short and medium term consequences. After a two-year follow-up, radiologically one case of pseudarthrosis and one case of patellofemoral osteoarthritis were noted. According to the Bosman score, we found 17.65% excellent, 47.06% good and 35.29% poor functional results. **Conclusion:** Patella fractures are relatively rare. Treatment is primarily surgical for transverse and/or displaced fractures; Bracing is the osteosynthesis technique of choice. However, knee stiffness, pseudarthrosis and patellofemoral osteoarthritis are not uncommon.

## Keywords

Fractures, Patella, Bracing, Patellofemoral Osteoarthritis

## 1. Introduction

Patella fractures are defined as a solution of bone continuity whose line sits on the patella. They usually occur as a result of distraction and three-point flexion of the patella as well as direct blows [1]. They account for approximately 1% of all skeletal injuries and can lead to profound impairment due to their crucial function in the extensor mechanism of the knee [2]. The patella is the largest sesamoid bone in the body, subcutaneous, very vulnerable with a false reputation for benignity. It is a rupture of the extensor apparatus of the knee and the treatment remains surgical [3].

Diagnosis is based on the mechanism of injury, physical examination and radiological findings. The treatment of these fractures is most often surgical and the prognosis depends on the anatomical lesion and the quality of the treatment [4] [5]. Surgical treatment is required for displaced fractures greater than 2 mm and may include open reduction and internal fixation, partial patellectomy or, rarely, total patellectomy [1].

Regardless of the treatment method, early rehabilitation is recommended to avoid knee joint capsule contractures and cartilage degeneration.

The concern for adequate initial care, especially for open fractures and the use of osteosynthesis material on the one hand; preservation of postoperative knee function on the other hand, were our main motives for this study.

The objectives of this study were to assess the epidemiological, therapeutic and evolutionary aspects of patellar fractures.

## 2. Methodology

This study was carried out in the Orthopedics-Traumatology department of the Donka National Hospital. This was a 3-year retrospective descriptive study, from January 1, 2016 to December 31, 2018, involving 17 patients including 15 men and 2 women received for patella fracture. All patients treated surgically and followed in the department during the study period were included. Patients treated orthopedically (vertical fractures with little or no displacement) and/or with incomplete records were excluded from the study. The average age was 36.65 years with the extremes of 16 years and 84 years and a sex ratio (M/F) of 7.5. Road accidents were the most common circumstances in which these fractures occurred. The diagnosis was based on the clinical basis, comprising the mechanism of injury and the physical and radiographic examination with AP and profile views of the knee. The bone lesions were classified according to Duparc into three types: type I corresponded to simple transverse fractures, type II to transverse fractures with comminution of the distal fragment and type III, to comminuted star fractures. All the patients were operated under regional anesthesia by spinal anesthesia and the osteosynthesis was made by bracing, cerclage and the association of the two techniques, using Kirschner wires of 18/10 gauge and steel wires. The patients were all installed in the supine position on an ordinary table. We made an anterior approach in all patients. After the reduction of

the fracture site, the synthesis was made by two Kirschner wires of 18/10th in a vertical and parallel way and a steel wire arranged in a figure of eight (8) performing the bracing in 10 patients; by the steel wire performing the equatorial strapping in 6 patients or by the combination of these two techniques in one patient. The average length of hospitalization was 3 to 7 days. Knee stiffness was the most recorded complication in our study. The evaluation of the functional results of the treatment was made after an average follow-up of six (6) months. For this assessment, we used the Bosman score which includes eight parameters: range of motion, pain, work, quadriceps atrophy, ambulation assistance; joint effusion, stooping, and stair climbing. The sum of points is equal to 30 points. The results are:

- Excellent: (28 - 30 points); -Good: (20 - 27 points); - Bad: (<20 points).

Limits and difficulties: During the study period, the Orthopedics-Traumatology department of the Donka National Hospital was relocated to Camp Camayenne (military camp located opposite the hospital) for reasons of renovation and extension of the hospital. This reduced the attendance rate. The quality of certain medical documents was degraded, which forced us to eliminate these files from the study.

Data counting and analysis were done using Word, Excel and Epi info version 7.2.2.2 software.

### 3. Results

We recorded 17 cases of patella fractures including 15 men or 88.24% and 02 women or 11.76% with a sex ratio (M/F) of 7.5. Public road accidents were the circumstances of occurrence most encountered in our series with 9 cases or 52.94%, with a predominance of the age group from 21 to 30 years with 5 cases or 29.42%. The fractures were open in 12 cases or 70.58%. The associated lesions were dominated by ipsilateral femur fractures in 5 cases, *i.e.* 29.42%. Duparc's type II was the most common in 8 cases, *i.e.* 47.06%. Bracing was the most used surgical technique with 10 cases or 58.83%, followed by equatorial strapping with 6 cases or 35.29% and mixed treatment (staying + equatorial strapping) in 1 case or 5.88% (**Table 1**). All our patients (17) received regional anesthesia, *i.e.* 100%. The anterior approach was performed in all our patients, *i.e.* 100%. The average length of hospitalization was between 1 to 5 days in 9 of our patients, *i.e.* 52.95% (**Table 2**). Two (02) patients or 22.22% presented an infection in the

**Table 1.** Distribution of patients according to the surgical technique used.

KINDS	WORKFORCE	PERCENTAGE (%)
GUYS	10	58.83
EQUATORIAL STRAPPING.	6	35.29
MIXED (GUYS + STRAPPING)	1	5.88
TOTAL	17	100

**Table 2.** Distribution of patients according to evaluation of results (Bosman score).

Score	Workforce	Percentage (%)
EXCELLENT	6	35.29
GOOD	9	52.95
WRONG	2	11.76
TOTAL	17	100

immediate postoperative period, which we suppressed by targeted antibiotic therapy after antibiogram; one (01) case of secondary necrosis, *i.e.* 11.11%.

After three (03) months, four (04) patients or 44.45% presented knee stiffness which required mobilization under general anesthesia.

After a decline of six months (**Figure 1**), we identified one (01) case of pseudarthrosis or 5.88% and one (01) case of patellofemoral osteoarthritis or 5.88%.

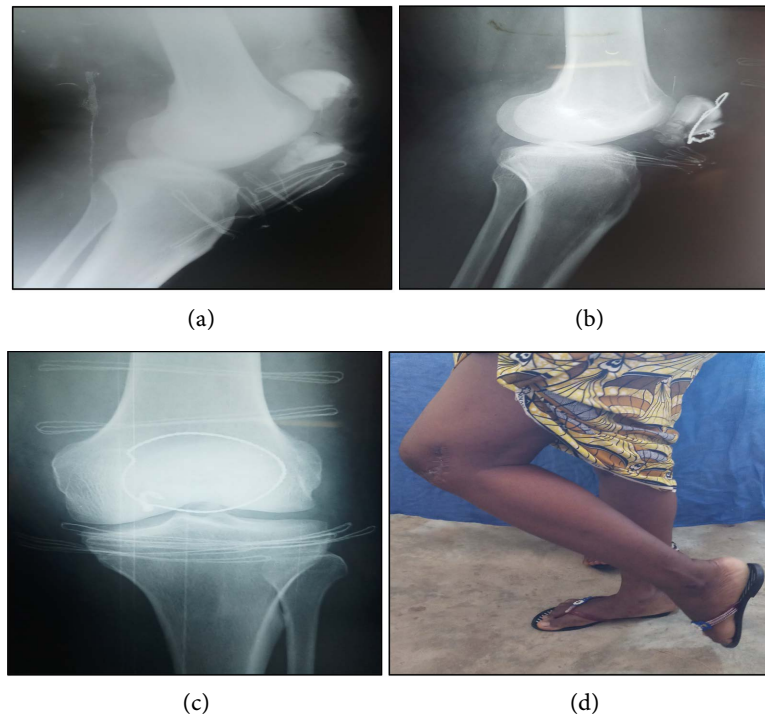
Our functional results were excellent and good in 15 patients, *i.e.* 88.24%.

#### 4. Discussion

The average age was 36.65 years in our series. This result corroborates with several data from the literature (Wahab, M.A. [8] 41 years old; Abalo, A. [9] 35.9 years old; Boukhani, N. [10] 43 years old. This result could be explained by a on the other hand, by the fact that young adults constitute the most active layer of society in search of everyday life, therefore the most exposed to trauma; on the other hand by the use of two-wheeled vehicles by this layer as a means of transport The male gender was dominant, *i.e.* 88.24% with a sex ratio of 7.5. This is consistent with series in the literature (89.50% with a sex ratio of 8.5 [4]). Male predominance is noted in series of the literature [4] [8] [9]. The accidents of the public roads represented the main circumstance of occurrence of the fractures of the patella is 52.94%. This also agrees with many publications [3] [8] [9]; would be largely justified by the advent of motorcycle taxis in public transport in our regions, but at the ssi by the increase in traffic accidents (dashboard accident).

We used three surgical techniques in our series, the most dominant of which was bracing, *i.e.* 58.83%, because of its simplicity of implementation and its resistance to the traction forces exerted by the quadriceps system on the patella, by transforming them into compressive forces. The goal of treating patella fractures is to restore joint congruence and restore the extensor apparatus of the knee [4]. Surgery has become the treatment of choice. Several surgical methods have been recommended in the literature (YANG 2010 [11])

Stiffness was the most common complication in our series, 44.45%. This result could be explained on the one hand by the delay in the care of the patients, on the other hand by the prolonged immobilization after treatment of the patella by equatorial cerclage and the failure to start the early rehabilitation of the patients who lived outside the capital and who did not respect the post-operative check-up appointments.



**Figure 1.** (a) Fracture of the patella, Duparc type II; (b and c) osteosynthesis by cerclage; (d) knee flexion at six months.

## 5. Conclusion

Patella fractures are relatively rare. Treatment is essentially surgical for transverse and/or displaced fractures; Bracing is the osteosynthesis technique of choice. However, knee stiffness, pseudarthrosis and patellofemoral osteoarthritis are not uncommon.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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