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Case Series

Management of Schatzker Types I, II and III Fractures of the Lateral Tibial Plateau in Niamey (Niger): About 33 Cases

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Abstract: Low-velocity tibial plateau fractures are not very comminuted and classically involve the lateral tibial plateau. The aim of this study was to present the anatomical and functional results of surgical treatment of external tibial plateau fractures classified as Schatzker types I, II and III. This was a cross-sectional study with prospective data collection, involving 33 patients. Functional results were assessed by the Lysholm score, and anatomical results by the Duparc and Cavagna criteria. The mean age of patients was 44.7 years, with a predominance of males (sex ratio 3 (25H/8F)). Road traffic accidents were the most frequent etiology, occurring in 28 patients (84.8%). Schatzker type I fractures were the most frequent, with 14 cases (42.4%). Osteosynthesis with a screw plate was the most common method of fixation in 15 patients (45.5%), followed by percutaneous screw fixation under fluoroscopic control in 13 cases (39.4%). The mean follow-up was 44.09 months. The mean Lysholm score for functional results was 90.09/100. Osteosynthesis using screw plates and percutaneous screw fixation under fluoroscopic control remains an effective therapeutic approach with good results.

Keywords: Lateral Tibial Plateau, Management, Low-Velocity Fractures, Niamey.

INTRODUCTION

Tibial plateau fractures are solutions of continuity of the spongy epiphyseal-metaphyseal block of the proximal end of the tibia, with at least one line dividing the articular cartilage (Chauveaux *et al.*, 2002). A distinction is made between low-velocity and high-velocity fractures, whose characteristics range from simple to complex, with little or extensive joint damage (Berkson & Virkus, 2006; Dirschl & Dawson, 2004). Low-velocity fractures are not very comminuted and typically involve the lateral tibial plateau, with minimal soft-tissue involvement(Sie Essoh & Lambin, 2016). These fractures are treated surgically, using a variety of fixation methods, including arthroscopically-assisted or non-arthroscopically-assisted percutaneous screw fixation and screw-plate osteosynthesis (Jean-Eric *et al.*, 2022; Merouane *et al.*, 2015). Whatever the method of fixation, this treatment must result in anatomical reduction and solid synthesis, enabling early rehabilitation (Adoum *et al.*, 2023).

The aim of this study was to present the anatomical and functional results of surgical treatment of external tibial plateau fractures classified as Schatzker types I, II and III.

PATIENTS AND METHOD

This was a cross-sectional study with prospective data collection, running from November 1st, 2018 to October 31th, 2022 involving 33 patients.

Included were male and female patients aged 18 years and older who had been managed for a fracture of the lateral tibial plateau classified as Schatzker types I, II or III who had received surgical treatment.

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Not included in the study were patients under 18 years of age; patients who had received orthopaedic treatment; patients discharged against medical advice and patients admitted with an old fracture.

Therapeutic Indications

Pure separation fractures were treated by percutaneous screw fixation under fluoroscopic control (n=14),

Sinker fractures and mixed fractures were treated by raising and internal osteosynthesis using a "T" or "L" plate, with or without cortico-cancellous bone grafting to fill the void (n=19). Submeniscal arthrotomy was performed for better control of joint reduction.

Criteria for Assessing Treatment Results

At longest follow-up, functional results were assessed by the Lysholm score and anatomical results by the Duparc and Cavagna criteria.

RESULTS

Patient age was 44.7 years, with extremes ranging from 18 to 68 years. Male predominance was found, with a sex ratio of 3 (25H / 8F). Road accidents were the most frequent etiology, occurring in 28 patients (84.8%). Schatzker type I fractures were the most frequent with 14 cases (42.4%), followed by type II fractures in 36.4% (n=12), then type III fractures, found in 21.2% of cases (n=7) (Figure 1).

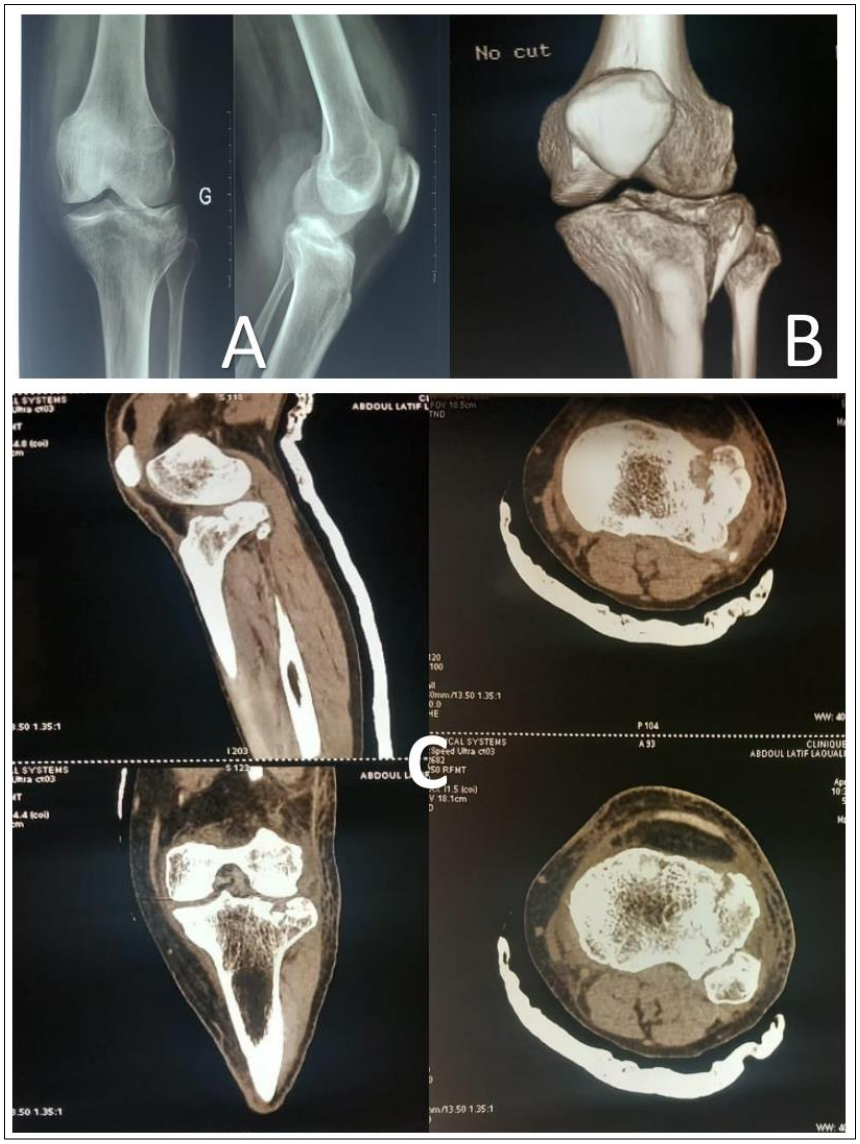

Figure 1: Radiographic image of the left F/P knee (A) and CT scan of the knee in 3d (B) and 2d (C) showing a depressed separation fracture of the lateral tibial plateau classified as Schatzker type II. (Image from the Department of Orthopaedic and Traumatological Surgery, HNABD, Professor Souna B S)

The mean time from trauma to surgery was 6.6 days, with extremes ranging from 1 day to 19 days. Spinal anaesthesia was used in 93.9% (n=31) of patients, and general anaesthesia in 6.9% (n=2). The external Gernez approach was used in 60.6% (n=20) of cases, followed by the minimally invasive approach in 39.4%

(n=13). A cortico-cancellous bone graft harvested from the homolateral anterior iliac crest was performed in 42.4% (n=14) of cases.

Mean operating time was 79.7 min, with extremes of 25 min and 205 min. Osteosynthesis with a screw plate was the most common method of fixation used in 15 patients (45.5%), followed by percutaneous screw fixation under fluoroscopic control in 13 cases (39.4%), and screw fixation with a screw plate in 5 cases (15.2%).

Early and secondary post-operative complications were dominated by surgical site infections in 3 cases (9.1%), followed by one case (3%) of suture loosening and one case (3%) of death. The case of death occurred in a 44-year-old HIV-positive diabetic patient admitted for a tibial plateau fracture, where the postoperative course was complicated by the onset of pulmonary tuberculosis, following which the patient died on the seventh postoperative day. Late complications included knee stiffness in 9.1% of cases (n=3), gonarthrosis in 6.1% (n=2) and callus in 3% (n=1).

The mean time to consolidation was 13.19 weeks, with extremes ranging from 9 weeks to 19.5 weeks.

The mean follow-up was 44.09 months, with extremes of 6 months and 75 months.

The mean Lysholm score was 90.09/100 (extremes 55 to 100), with 72.7% (n=24) of patients having a satisfactory result (Excellent and Good) for functional outcomes.

Anatomically, according to the DUPARC and CAVAGNA criteria, we found 20 cases with very good results, i.e. 62.5%; 10 cases with good results, i.e. 31.2%; and 2 cases with poor results, i.e. 6.3% (Figure 2).

Figure 2: Radiographic image of the F/P knee showing a consolidated fracture on a screwed "T" plate at 18 months post-op (A) and clinical results (B &C) (Image from the Orthopaedic and Traumatological Surgery Department of the HNABD, Professor Souna B S)

DISCUSSION

We report the results of the management of external tibial plateau fractures classified as Schatzker types I, II and III. These fractures are treated surgically when there is 3 to 5 mm depression and/or separation and 10° valgus or varus (Hung *et al*., 2023).

Epidemiologically, patients with tibial plateau fractures are predominantly male, with a sex ratio of 3,

between the 4th and 5th decade of life, with an average age of 44.7 years, most often caused by a road accident. In fact, young people make up the largest segment of the population in Niger, and are the most exposed to road accidents.

The mean time from trauma to surgery was 6.6 days, with extremes ranging from 1 to 19 days. This is relatively long compared with the time reported by Manidakis N *et al*., (Manidakis *et al*., 2010), with extremes ranging from 3 hours to 10 days. Lack of financial means, the problem of immediate availability of material, and the unavailability of the operating theatre are the main reasons for this delay in our context.

Screw-plate osteosynthesis was the most commonly used method of fixation in 45.5% of cases (n=15), followed by percutaneous screw-plate osteosynthesis under fluoroscopic control in 39.4% (n=13). Screw-plate osteosynthesis remains the most widely used method of fixation in the treatment of tibial plateau fractures. Our therapeutic attitude is similar to that of Da SC *et al*., (Da *et al*., 2018), who reported a rate of 65.2%. Screw-plate synthesis provides a stable synthesis and enables rehabilitation to be started rapidly. However, this technique has a number of drawbacks, in particular the submeniscal arthrotomy, which is often a source of prolonged pain and healing problems (Stevens *et al.*, 2001).

Surgical site infection was the most common early complication in 3 cases (9.1%), while knee stiffness was the most common late complication in 9.1% of cases (n=3). In fact, knee stiffness is mainly due to a delay in the start of rehabilitation. Despite these complications, all fractures consolidated within an average of 13.19 weeks.

Functional results were satisfactory in 72.7% of cases. This result is similar to that of Koulali *et al*., (Koulali *et al.*, 2003), who reported satisfactory results in 67% of cases.

Conclusion

Our study shows that low-velocity lateral tibial plateau fractures are common in young patients. Osteosynthesis using screw plates and percutaneous screw fixation under fluoroscopic control remains an effective therapeutic approach with good results.

References

- Adoum, A., Dalatou, M., Niandou, A., Abdoul Wahab, A., Covalis, M., & Souna, B. (2023). Traitement Chirurgical des Fractures des Plateaux Tibiaux à Niamey: À Propos de 27 Cas. *Health Sci. Dis*, *24*(3), 72-76.
- Berkson, E. M., & Virkus, W. W. (2006). High-Energy Tibial Plateau Fractures. *JAAOS - Journal of the American Academy of Orthopaedic Surgeons*, *14*(1), 20.
- Chauveaux, D., Souillac, V., & Le Huec, J. C. (2002). Fractures des plateaux tibiaux : Fractures récentes. *Éditions techniques. Encycl Med Chir, Elsevier, Paris; Appareil Locomoteur*, 14-080.
- Da, S. C., Dabiré, M. N., Korsaga, A. S., Ouédraogo, J. I. A., Kafando, H., Tinto, S., Sagnon, B., & Tall, M. (2018). Osteosynthesis Results of Tibia Plateau Fractures at the Yalgado Ouedraogo University Hospital Center. *Open Journal of Orthopedics*, *8*(10), Article 10. https://doi.org/10.4236/ojo.2018.810039
- Dirschl, D. R., & Dawson, P. A. (2004). Injury Severity Assessment in Tibial Plateau Fractures. *Clinical Orthopaedics and Related Research (1976-2007)*, *423*, 85-92. https://doi.org/10.1097/01.blo.0000132626.13539.4b
- Hung, S. S., Chao, E.-K., Chan, Y.-S., Yuan, L.-J., Chung, P. C., Chao-Yu, Lee, M. S., & Wang, C.-J. (2023). Arthroscopically Assisted Osteosynthesis for Tibial Plateau Fractures. *The Journal of Trauma: Injury, Infection, and Critical Care*, *54*(2), 356-363.
- Jean-Eric, K. K., Ibrahim, S., Adélaïde, K. A., Innocent, M. K., Régis, A. A. J., & Michel, K. (2022). Résultats du traitement chirurgical des fractures du plateau tibial en milieu tropical. *Rev int sc méd Abj*, *24*(1), 105-113.
- Koulali, K. I., Rafai, M., Cohen, D., Fnini, S., Largab, A., Ouarab, M., & Trafeh, M. (2003). Fractures des plateaux tibiaux : À propos de 100 cas. *Revue Marocaine de Chirurgie Orthopédique et Traumatologique*, *18*, 14-21.
- Manidakis, N., Dosani, A., Dimitriou, R., Stengel, D., Matthews, S., & Giannoudis, P. (2010). Tibial plateau fractures: Functional outcome and incidence of osteoarthritis in 125 cases. *International Orthopaedics*, *34*(4), 565-570. https://doi.org/10.1007/s00264-009-0790-5
- Merouane, A., Amine, B., Hamza, B., Ahmed Reda, H., & Mohammed, N. (2015). Traitement des fractures des plateaux externes par vissage percutané assisté par arthroscopie. *Pan African Medical Journal*, *21*(287).
- Sie Essoh, J., & Lambin, Y. (2016). Fractures des plateaux tibiaux à haute vélocité : Evaluation et traitement. *Afr J Orthop Trauma*, *1*(2), 95-101.
- Stevens, D. G., Beharry, R., McKee, M. D., Waddell, J. P., & Schemitsch, E. H. (2001). The Long-Term Functional Outcome of Operatively Treated Tibial Plateau Fractures. *Journal of Orthopaedic Trauma*, *15*(5), 312-320.

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