TIBIAL PLATEAU FRACTURES - EPIDEMIOLOGICAL ANALYSIS

MIHAI ROMAN[1], ADRIAN BOICEAN[2], RADU FLEACĂ[3]

[1,2,3]*"Lucian Blaga" University of Sibiu*

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Abstract: *Tibial plateau fractures are a constant challenge for the trauma surgeon, both for their complexity and for their great variability. Purpose: Evaluation of the epidemiological characteristics in tibial plateau fractures treated in the County Hospital Sibiu. Material and methods: 210 patients with tibial plateau fractures, treated between 1.01.2009 -31.12.2015 were evaluated. Several epidemiological variables were assessed. Results and discussions: The mean age of the patients was 54.5 years. The incidence of these fractures is higher, between 51-70 years. There was a slightly greater incidence in the male population. No difference between dominant and non-dominant limb was found. The majority of these fractures were produced by falling. There is a high prevalence of associated injuries - menisci, collateral/cruciate ligaments and fibula - and hemartrosis is present in a high percentage. Conclusion: Correct evaluation of epidemiological factors is mandatory for a proper understanding of the complexity of tibial plateau fractures.*

INTRODUCTION

Tibial plateau fractures raises therapeutic challenges and have to be well treated because of the potential complications. Understanding the whole picture of these fractures and judging each case individually increases the quality of final results. The correct evaluation of these fractures is essential for reducing the risk of complications.(1,2)

PURPOSE

The purpose of this paper is to evaluate the epidemiological characteristics in tibial plateau fractures treated in the Clinic of Orthopaedics and Trauma in the County Hospital Sibiu.

MATERIALS AND METHODS

We evaluated retrospectively a total of 210 patients with tibial plateau fracture who were treated in the Clinic of Orthopaedics and Trauma Sibiu in the period 1.01.2009-31.12.2015.

We analysed the following documents: inpatient observation sheets, operation protocols, patient discharge data from the Statistical Office of the Hospital.

This study included patients of both sexes, aged between 18 and 100 years, suffering fractures of the tibial plateau of any kind (AO and Schatzker Classification).(3,4)

This study did not include patients with open fractures.

Detailed evaluation before treatment included history (mechanism of production) and the presence of comorbidities or other secondary traumatic lesions.

Several variables were assessed: gender, age, environment, diagnosis, mechanism of action, date of admission and discharge.

RESULTS AND DISCUSSIONS

We studied a total of 210 patients who underwent tibial plateau fractures, of which 93 were women and 117 were men.

Fractures of the tibial plateau are distributed approximately equally between the two limbs. Frequency of the lesion of a specific limb has no connection with the limb being dominant or not.

It was found an incidence of 7.5 cases per 100 000 inhabitants per year (30 cases- to about 400 000 inhabitants - county population), lower than the international literature studies (10.3).

The incidence of these fractures is higher (68%) in the age groups 41-50 years, 51-60 years, 61-70 years, with the peak age group 51-60 years. The average age in these patients is 54.5 years compared to 44.5 in international studies.

These results are explained by a certain decrease of bone quality at this age. In the groups below 50 years, albeit with better bone strength, these fractures occur by mechanisms of greater energy.

It can be seen that in the patients category between 51-60 years, tibial plateau fractures are more common in males Then, after this age, fractures are more common in females. This is explained by the participation of men in the more intense events and physical activities with high risk.

142 patients are of urban origin (68%) and only 68 patients come from rural areas (32%). This difference is probably explained by the fact that the urban population is numerically larger.

In terms of the mechanism of production, there is a high percentage of falling - at the same level or from one level to another (58%) - compared to other mechanisms such as car accidents or direct trauma. Analysing the fractures caused by accidents, an increased incidence among pedestrians (15%) can be seen.

Patients who have this mechanism of falling are usually of more advanced age (average - 57 years). These fractures are due to low bone strength, a large number of these fractures being found in women.(5,6,7)

Fractures of the tibial plateau which have, as a

[2]Corresponding author: Adrian Boicean, Str. Lucian Blaga, Nr. 2A, Sibiu, România, E-mail: adrian.boicean@yahoo.com, Phone: +40722 304379
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mechanism of production, horse and cart accidents are more common in rural areas, males with a mean age 57 years being the most incriminated.

Analysing the frequency of fractures by the year time, we found that the majority of the tibial plateau fractures occurred in winter with a total of 67 cases (32%). This is explained by the adverse weather conditions, most of these fractures being produced by falling at the same level by dropping or sliding on snow and ice. During summer, we have found a total of 60 cases (29%), approaching that of the winter period. In the warm seasons, fracture mechanisms are variable, but a majority of them occurred after car accidents, cyclists and motorcyclists being often involved. During spring, there were a total of 47 cases. Of all the seasons, it was found that in autumn, the fewest cases were recorded - 36 (17%).

In terms of simultaneous association with other injuries, we can see that a large percentage of the fractures (84%) are isolated. Only 16% of cases were multilesional. Although polytrauma patients represent only 12%, this group is of particular importance from a therapeutic standpoint.(8,9,10)

The most common associated fractures are the ones of the fibula because of the very close situation to the tibial plateau. Thus, when the energy of the traumatic event is very high, those associated fractures occur. Other associated fractures such as clavicle, rib and vertebrae fractures, fractures of the upper limbs, patella and calcaneus fractures occur typically in the context of polytrauma.(11,12)

Meniscus injuries are common in tibial plateau fractures, accounting for 35% of cases, and are usually produced by a medium-energy trauma. Ligament injuries are found in 23% of all cases. Most frequently, they occur in the collateral and cruciate ligaments of the knee, produced by high-energy mechanisms. These lesions are diagnosed through clinical examination, imaging and intraoperative assessment.(13)

Hemartrosis is present in a high percentage of tibial plateau fractures (57%) and compartment syndrome has a frequency of 2% and usually requires emergency fasciotomy.

Medical history of the patient should be considered before starting treatment of a tibial plateau fracture. Thus, we see that the incidence of heart diseases is the highest, accounting for 40%. Among the most common associated heart diseases are: angina pectoris, chronic ischemic heart disease, congestive heart failure, hypertension, arrhythmias and arytmia.

Metabolic disorders are the second, after heart diseases (24%). Obesity is the leader of metabolic disorders which accompanies these fractures.

CONCLUSIONS

Fractures of the tibial plateau represent a complex pathology that must be addressed properly to prevent complications. Men have a slightly higher incidence, and the most affected age group is 51-60 years followed by 61-70 years decade. The average age of patients with tibial plateau fractures is 54.5 years. They are produced in 55% of the cases in the left knee. This type of fracture occurs more frequently in urban areas with a higher-frequency during the winter. Correct evaluation of epidemiological factors is mandatory for a proper understanding of the complexity of tibial plateau fractures.

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