



## Clinico-Epidemiological Study of Tibialplateau Fracture

## KEYWORDS

Clinico-Epidemiological Study, TibialPlateau Fracture.

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**ABSTRACT**

**Introduction:** "The head of the tibia is sometimes obliquely broken; and if it be fractured into the knee joint the treatment which it requires is similar to that which is necessary in the oblique fracture of the condyle of the OS femoris; that is, first: The straight position of the limb, because the femur preserves the proper adaptation of the fractured tibia by forming a splint to its upper portion, and keeping the articular surfaces in opposition. Secondly, a roller to press one part of the broken surface against the other. Aims and Objectives: To study Clinico-Epidemiological Study of TibialPlateau Fracture Methodology: This is institutional based prospective study which comprises of 50 patients with displaced tibial plateau fracture and were treated between jan 2012 to jun 2013 with minimal invasive percutaneous plate osteosynthesis (MIPPO). Statistical analysis done by Chi-square test. Result: Mean age of the patients in this study was 40.38 years. 68% of the patients were in age group 31-50 years. Prevalence of tibia plateau fracture was more in male than in female (72% male and 28% female). Right sided tibial plateau fracture was more commonly involved than left. (56% and 44%) Road traffic accident was the major cause of fracture in age <50 years whereas fall and other causes were major cause in age >50 years. Conclusion: The main conclusions of this study were- Prevalence of tibial plateau fracture was more in male than in female. Prevalence of tibial plateau fracture was more in the age group 31-50 years. Right sided tibial plateau fracture was more commonly involved than left. Road traffic accident was major cause of fracture in age <50 years whereas fall and other causes were major cause in age >50 years.

**Introduction:** "The head of the tibia is sometimes obliquely broken; and if it be fractured into the knee joint the treatment which it requires is similar to that which is necessary in the oblique fracture of the condyle of the OS femoris; that is, first: The straight position of the limb, because the femur preserves the proper adaptation of the fractured tibia by forming a splint to its upper portion, and keeping the articular surfaces in opposition. Secondly, a roller to press one part of the broken surface against the other. Thirdly, a splint of paste board to assist in the preservation of that pressure and fourthly, early passive motion to prevent ankylosis" Sir Astley Cooper (1825) <sup>1</sup> (This was the first written document about description and management of tibial plateau fracture, some aspects of which are relevant even today) Knee joint is one of the three major weight bearing joints of the lower extremity and also one of the most challenging to treat. Fractures of the proximal tibia, particularly those that extend into the knee joint are termed as tibial plateau or tibial condylar fractures. Advances in mechanization and acceleration of travel have been accompanied by increase in numbers and severity of fractures in which tibial plateau is no exception. These fractures constitute about 1% of all fractures and 8% of the fractures in elderly with ever increasing incidence in modern lifestyle. The Lateral condyle is more frequently involved than the medial condyle<sup>2</sup>. Whereas the involvement of both condyles is found in 10 to 30% of the reported series.<sup>3</sup> Injuries to this joint can result in functional impairment, as they affect knee alignment, stability and movement and lead to instability, deformity, stiffness, arthritis, and rarely nonunion.

**Methodology:** This is institutional based prospective study which comprises of 50 patients with displaced tibial plateau fracture and were treated between jan 2012 to jun 2013 with minimal invasive percutaneous plate osteosynthesis (MIPPO). All patients were screened using following inclusion and exclusion criteria. Mono-trauma polytrauma patients. Grade I, II, IIIA compound fracture, Medically fit for surgery, < 2 weeks post fracture. Were included into study whereas Fracture due to malignancy, Grade IIIB and IIIC compound fractures, Non-ambulatory previous fracture, Severe dementia, Medi-

cal contra-indication to surgery were excluded from study. Statistical analysis done by Chi-square test.

**Result:****Table 1. Distribution of Cases According To Age.**

Age (in years)	Number of cases	Percentage
21-30	7	14%
31-40	19	38%
41-50	15	30%
51-60	6	12%
61-70	3	6%
Total	50	100%

In present study, patients were of age group between 20-70 years. Majority of our patients (68%) were in middle age group i.e. 31-50 years. This may be due to more involvement of this age in outdoor and travelling activities in India. 14%, 12% & 6% were in the age group of 21-30 years, 51-60 years & 61-70 years respectively. Mean age in present study was 40.38 years. SD 40.38 ± 10.59.

**Table 2. Distribution of Cases According To Sex**

Sex	Number of cases	Percentage
Male	36	72%
Female	14	28%

The ratio between male to female was 2.57:1 in this study. There was more male prevalence. The lower incidence of fracture of the tibial Plateau in females may be due to their lesser involvement in outdoor activities.

**Table 3. Distribution of Cases According To Mechanism Injury**

Mechanism of Injury	Number of cases	Percentage
R.T.A	35	70%
Fall	13	26%
Other	2	4%

In present study, 70% of the fractures were because of Road traffic accident, 26% of fractures were because of

fall, and only 4% were due to other causes such as assault.

**Table 4. Distribution Of Cases According To Side Involved**

Side involved	Patients	Percentage
Right	28	56%
Left	22	44%
Bilateral	00	00%

In present study the right side (56%) was involved more than the left side (44%) .

**Table 5. Relationship between Age of Patient and Cause Of Fracture**

Age	Road traffic accident	Fall	Others	Total
<50	32(78)	7(17)	2(5)	41(100)
>50	3(33.33)	6(66.6)	0(00)	9(100)
Total	35	13	2	50

Figures in parenthesis denote percentages  $\chi^2 = 9.528$  d(f) 2 p<0.01

The association between age of patients and cause of fracture is highly significant (P < 0.01).

In present study, Road traffic accident constitutes the major cause of morbidity (78%) in < 50 years of age whereas self -fall mainly result in morbidity (66.66%) in > 50 years of age.

**Discussion:** High energy intra articular fractures of the tibial plateau remains challenging for orthopedic surgeonseven in the present day. The fracture being intra articular complicates the treatment plan. However the goal is to obtain a stable joint re-constitution permitting early range of motion for cartilage nourishment and preservation. A prospective study was conducted in 50 patients who presented with closed or grade I/ II compound Tibial plateau fracture and fitting in the determined inclusion and exclusion criteria. Thus the study was conducted with the aim to evaluate the clinical profile of tibial plateau fractures in tibial plateau fractures. **AGE INCIDENCE :**

STUDY	MEAN AGE (YEARS)
Present study	40.26
Boune	38.5
Seppo <sup>4</sup>	39.8
Porter <sup>5</sup>	47
Bowes and Hohl <sup>6</sup>	48
Duvelius and Conolly <sup>7</sup>	48

The mean age of the patients in present study group was 40.38 years.14%, 38%, 30%, 12% & 6% were in the age group of 21-30 years, 31-40 years, 41-50 years, 51-60 years & 61-70 years respectively. Distribution of age groups and mean age in the present study is same to study done by Boune in 1981 found that the majority of the patients are aged between 15-55 years with an average of 38.5 years and Seppo<sup>4</sup> also showed age incidence 20-60 years with an average of 39.8 years. Porter<sup>5</sup> in 1970 reported an average age of 47 years in his study of 68 cases. Bowes and Hohl<sup>6</sup> in 1982 and Duvelius and Conolly<sup>7</sup> in 1988 reported average age group of 48 years.**SEX INCIDENCE:-**In present study, ratio between male to female was 2.57:1. In the study done by Biggi et al, ratio between male to female was 2:1 The dominance of male may be because of – Males are more involved in outdoor activities, hence more vulnerable to vehicular accidents. Due to social customs, certain tasks which involve more risk are done by males e.g. working at heights, driving, and labour work and travelling.

Most of the studies by Bowes and Hohl<sup>6</sup>, and Duvelius and Conolly<sup>7</sup> showed a male preponderance.

STUDY	Male	Female
Present study	72%	28%
Biggi et al <sup>12</sup>	67%	33%
Manidakis et al <sup>9</sup>	58%	42%
rademaker et al <sup>10</sup>	56%	44%
Tscherne et al <sup>13</sup>	55%	45%

**MACHANISM OF INJURY :**In the present study the commonest mechanism of injury was road traffic accidents in 70% of the patients followed by fall in 26% of the patients. 4% of cases were due to other causes like assault. Chaix et al<sup>8</sup> in 1982 reported 71% of their cases were due to RTA 16% due to fall from height, 12% due to fall from level surfaces and 1% due to sports injuries. Manidakis et al<sup>9</sup> in 1984 reported the most common mechanism of injury were motor vehicle accidents 69%, 30% were due to fall and 1% were due to other causes. Rademaker et al<sup>10</sup> reported most common cause was by RTA, that is 53% of the cases. Lansinger O<sup>11</sup> reported 31% of the patients injured due to direct trauma, 33% due to fall from height and 36% fall from level surface.

STUDY	RTA	FALL	OTHER
Present study	70%	26%	4%
Chaix <sup>8</sup>	71%	28%	1%
Manidakis et al <sup>9</sup>	69%	30%	1%
Rademaker et al <sup>10</sup>	53%	29%	18%

**Conclusion:**The main conclusions of this study were- Prevalence of tibial plateau fracture was more in male than in female. Prevalence of tibial plateau fracture was more in the age group 31-50 years. Right sided tibial plateau fracture was more commonly involved than left. Road traffic accident was major cause of fracture in age <50 years whereas fall and other causes were major cause in age >50 years.

#### References:

- Hohl M: Tibial plateau fracture 1st edition. saunders 1997 chapter1 1-7
- Burri C, Bartzke G, Coldewey J, et al. Fractures of the tibial plateau. Clin Orthop 1979; 138:84-93
- Hohl M, Part-I: fractures of proximal tibia and fibula. In: Rockwood C, Green D, Bucholz R, eds. Fractures in adults, 3rd ed. Philadelphia: JB Lippincott, 1991:1725-1761 (remove)
- Honkonen SE., Indications for surgical treatment of condyle fractures; Clin Orthop, 1994; 320:199-205
- Porter B.B; Crush Fractures of the lateral tibial condyle. Factors influencing tire prognosis JBJS 1970; 52(Br):676.
- Bowes D.N., Hohl M; Tibial condyle fracture: Evaluation of treatment and outcome; Clin Orthop 1982:171
- Duvelius P.J., Conolly J.F; Closed reduction of the tibial plateau fracture: A comparison of functional and roengenographic end results; Clin Orthop 1988; 230:116-125.
- Chaix ; Fractures of the tibial plateau, In Install J.N., Winsdor R.E., Scott, ; surgery of the knee, 2nd Ed, New York ,Churchill Livingstone, 1993; 1038
- Nikolaos Manidakis, Ani Dosani, Rozalia Dimitriou; Tibial plateau fracture: Functional outcome and incidence of osteoarthritis in 125 cases in orthop 2010 April; 34(4):565-570.
- Rademakers MV, Kerkhoffs GM, Sieravelti N . Operative treatment of 109 tibial plateau fractures: rive- to 27-year follow-up results. J Orthop Trauma 2007; 21(1):5-10.
- Lansinger O., Bergman B., Korner L., Tibial Condylar fractures, A twenty year follow up, JBJS 1986; 68 :13-19
- Biggi F, Di Fabio, C D'Antirno, S. Trevisani; Tibial plateau fracture: internal fixation with locking plates and the MIPO technique. Injury 41(11): 1178-1182. nov 2010
- Tscherne H, Lobenhoffer P: Tibial plateau fractures, management and excepted result: Clin orthop 1993; 292:87-100