SCHATZKER'S V, VI TIBIAL PLATEAU FRACTURES MANAGED NON OPERATIVELY BY CASTING.

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ABSTRACT

Objective: To evaluate the outcome of non-operative management of ofSchatzker's V, VI tibial plateau fractures and to share our experience. **Study Design**: Prospective descriptive study. **Place and Duration of Study**: Department Of Orthopedic Surgery And Traumatology, Peoples Medical University Hospital, Shaheed Benazeer Abad between January 2016 and December 2019. **Methodology**: 27 cases of Schatzker's V, VI tibial plateau fractures with age ranging from 18 to 50 years of either sex, who were not willing for any kind of surgery, were included in the study, while patients with co-morbids, host type B, C excluded from study. All the variables of patients were assessed radiological and clinically and documented on designed proforma for study. Knee functional scores assessed and arthritic changes noted. **Results**: There were total 27 patients, 19(70.37%) were male & 8(29.63%) patients were female with mean age of 35.48±7.8 years. [Table 01] 10(37%) cases having Left sided while 17(63%) having right sided injury and none reported bilateral Schatzker V and VI. (44.44%) 12 were Schatzker V and (55.55%) 15 Schatzker VI.Most common factor for denying surgrey was advice by family or friends, followed by fear of surgery and fear of implant.The mean time for radiological bony union was 21.9±4.1 weeks. [Table 02] The average time of follow-up was 59.5±17.3 weeks.Range of motion at knee joint averaged 110°±15° of flexion and with 5.5°±2°with lack of full extension. **Conclusion**: Schatzker V, VI tibial plateau fractures when treated in cast and splint didn't give satisfactory functional outcomes. Patients are prone to develop early osteoarthritis so it is better to counsel the patients regarding surgical intervention.

Key Words: Schatzker's V, Schatzker's VI, Tibial Plateau Fractures, Union time.

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INTRODUCTION:

Proximal tibial articular fractures also called tibial plateau fractures are complex injuries and are not easy to deal.[1] These injuries are classified by schatzker in six groups, severity increases with rise in each grade from simple split fracture (schatzker I) to bi-condylar (schatzker V) and dissociation of metaphysis from diaphysis (schatzker VI). [2] These fractures being cancellous bony region tend to heal early. To achieve union is not big deal here as nonunion is rarely reported in literature. [3] These high energy complex fractures are complicated with extensive soft tissue injuries, wound related problems, compartment syndrome. [4] So soft tissue status is the key element to decide management plan.[5] Standard x-rays are usually antero-posterior and lateral views. Additionally 2D, 3D CT scan and MRI are recommended to know about the complete fracture personality, joint congruity, articular depressed segments, and soft tissue status especially ligaments, menisci injuries. [5]Literature witnesses about change in Schatzker grade which was documented after plain x-rays after going through CTand MRI scans. [6,7,8]

Proximal tibial fractures are reported 1.2% and its prevalence in Pakistan reported male and female are 4.73% and 0.35% respectively.[9,10] These typically influence the more youthful age gathering in their productive time of life and hence have an critical financial effect because of time taken for recovery and can lead resulting medical procedures and at last to add up to knee stiffness at early age due to the beginning stage of osteoarthritis. [11]

Throughout the long term, numerous treatment modalities have been proposed for these fractures. And the debate is never ending to choose the best.Every one of them, from basic traction to requesting the operative procedure, introduced reasonable results yet in addition genuine complications.Schatzker's V, VI grades are best treated with surgical intervention by multiple methods; plating, cannulated screws, wires and external fixation.[12]

Then again, open surgeries, in spite of their great reduction of fractured fragments, try not to secure the already harmed soft tissue envelope, prompting skin or muscle putrefaction and to add in complications. [13]. External fixation by Ilizrov, Taylor spatial frame and hybrid techniques are being accepted well by orthopedic community as treatment of choice. [12,14], however locking plates by minimal invasive methods achieves the same functional outcome. [15]

Casting is not recommended nowadays in these complex displaced intra-articular fractures and thought to be old method. As chances of knee joint cartilage wear and tear is more after knee trauma. In our country the community has fear of surgery, implants, so quackery is commonly practiced. This study was conducted to standardize the orthopedic attitude towards Schatzker V,VI tibial plateaufractures by knowing about the patients who did not went under surgical intervention by any means and to know about conservative aspects in patients clinically as well radiological.

Objective: To evaluate the outcome ofnon-operative management ofofSchatzker's V, VI tibial plateau fractures and to share our experience.

METHODOLOGY:

This descriptive prospective study was conducted at Department Of Orthopedic Surgery And Traumatology, Peoples Medical University Hospital ShaheedBenazeer Abad between January 2016 and December 2019 after permission from Ethical Review Committee of the institute. 27 cases with Schatzker V and VI close tibial plateau fractures with age ranging from 18 year to 50 year of either sex were chosen; the patients whowere willing for casting and didn't give consent for any kind of surgery were included for the study. While patients who were willing for surgery and who didn't give consent to participate in study, patients with co-morbid, host type B,C, poly-trauma patients, open fractures, with compartment syndrome, with neurovascular compromise, having history of poor patient tolerance, compliance, psychiatric illness and fits were excluded from the study.

Cases that satisfied inclusion criteria were selected for the study. Cases were managed according to ATLS protocol. The fractured limb x-rayed and splinted in proper way by above knee cast. Patients were observed by eagle eye for any developing compartment syndrome. Once settled from acute trauma, patient admitted and shifted to ward. Necessary analgesics, intravenous fluids, antibiotics, tetanus prophylaxis provided to the patient. All his routine baseline labs were advised, detailed history and clinical examination was noted on record file and proforma. Bio-data, mode of injury, time from injury to hospital, mode of transport and reason for not willing of surgery were documented on proforma.

Then patient and attendant were counseled and discussed in detail for management options, those who fulfilled study criteria were included in the study. Manual correction done in case of displaced fracture fragments and checked radiological. Then he discharged within few days after satisfaction on clinical and radiological grounds and called for follow-up in Out Patient Department.

At each visit patient assessed clinically as well radiological, as fracture becomes sticky in 4-6 weeks period, the above knee cast changed to patellar tendon bearing cast. Furthermore; patient addressed and guided properly regarding quadriceps exercises and active as well passive movements at knee and weight bearing in consecutive visits. As clinical and radiological union achieved patients allowed to full weight bearing initially in PTB cast followed by without any cast. Knee functional score was assessed by Rasmussen's knee functional score [16] and radiographs were assessed for osteoarthritis by Kellgren-Lawrence [17] grading system. All the data was entered in designed proforma and analyzed through SPSS version 20.

RESULTS:

There were total 27 patients, 19(70.37%) were male & 8(29.63%) patients were female M:F ratio was about 2:1. Minimum age was of 18 years and maximum of 50 years. The mean age was 35.48±7.8 years. [Table 01] Regarding the mode of injury, road traffic accident was reported in 18(66.66%) patients, 5(18.51%) had history of falls and assaults in 4(14.81%). 10(37%) cases having Leftsided while 17(63%) having right sided injury and none reported bilateral SchatzkerV and VI. (44.44%)12 were Schatzker V and (55.55%)15Schatzker VI. Average time from injury to hospital arrival was 13.92±11.07 hours. Our cases from trauma to hospital were transported by ambulance in 40.74% of cases, Datsun in 22.22%, taxi 14.81%, Qing qi rickshaw in 11.11%, donkey cart in 7.4%, and by motor bike in 3.7% of cases.Average hospital stay was 6±2.5 days. Above knee cast changed to PTB cast in 5.9±1.3 weeks.Partial weight bearing was achieved in 11.2±2.4 weeks, while full weight-bearing in cast 18.8±4.4 weeks and unsupported full weight bearing allowed in 20.55±3.33 weeks. The mean time for radiological bony union was 21.9±4.1 weeks. [Table 02]

Knee arthritis according to Kellgren-Lawrence [17] graded in weight bearing antero-posterior x-ray

of knee last visit and documented; seven (25.92%) were graded as 0, six (22.22%) graded as 1, five (18.51%) as 2, six (22.22%) as 3 and three (11.11%) as grade 4.According to Rasmussen's knee functional score [16], the results were excellent in 6(22.22%) cases, good in 9(33.33%) cases, fair in 7(25.92%) cases, and poor in 5(18.51%) cases.

The average time of follow-up was 59.5±17.3 weeks. At final visit of follow-up, 16 (59.25&)cases had step-off of more than 2 mm and 11(40.74%) had less than 2 mm. Varus deformity was less than 10° in 14.81% cases and 10-15° in 11.11% cases while valgus deformity in 7.4% of cases.Patients' knee Range of motion was gradually increasing at regular follow-up visits in OPD. At final visit, range of motion at knee joint averaged 110°±15° of flexion and 5.5°±2° lack of full extension.Various Factors regarding unwillingness for surgery are described in Table 03; most common factor was advice by family or friends, followed by fear of surgery and fear of implant. 5 cases lost follow-up, 3 cases became agree for surgery and two cases went in compartment syndrome so these are not included in the study.

VARIABLES n=27	VALUE
Male	n=19(70.37%)
Female	n=8(29.63%)
Mean age	35.48±7.8 years
Schatzker V	n=12(44.44%)
Schatzker VI	n=15(55.55%)
Right side	n=17(63%)
Left side	n=10(37%)
Average time from injury to hospital arrival	13.92±11.07 hours
Average hospital stay	6±2.5 days

Table 01: DEMOGRAPHIC DATA

VARIABLES	MEAN VALUE
Mean duration of follow-up	59.5±17.3 weeks
Mean ROM at knee	110°±15°
Mean time of bone union	21.9±4.1 weeks
Mean time of full weight-bearing	20.55±3.33 weeks

Table 02: FUNCTIONAL RESULTS

FACTORS	NUMBER OF PATIENTS	PERCENTAGE
Advice by friends/family	9	33.33
Fear of surgery	7	25.92
Fear of implant	5	18.51
Fear of amputation	3	11.11
Fear of infection	1	3.7
Fear of anesthesia	1	3.7
Affordability	1	3.7
Total	27	100%

Table 03: FACTORS REGARDING UNWILLINGNESS FOR SURGERY

DISCUSSION:

Trauma is escalating day by day, and high speed life has led to increase in incidence of this high energy complex tibial plateau injuries. As energy exceeds lead to more damage to soft tissues and skin integrity. If not looked in proper way can complicate in notorious way as in compartment syndrome.[18]AO group recommends internal fixation in these intra-articular fractures to get anatomic reduction, stable osteosynthesis and get proper rehabilitation.[19]

Average time to osseous union reported by Verma A [20] in 23.9 weeks to 25.1 weeks managed by Ilizarov, byKulkarni, S.G [21] in quite shorter time of 14.37 ± 3.41weeks by dual plating, byBabis GC [22] by hybrid external fixator in 3.4 months and by us in 21.9±4.1 weeks.

Schatzker V: VI ratio was 1:2 with 33% and 66% respectively shown in paper by Kulkarni, S.G [21], while we received 44% of Schatzker V and 55% of VI. Study done by Aseri MK [23] showed mean age of the patients 39.2±11.0 years and male predominance 71.8% while on other hand 35.48±7.8 was mean age by our study and we also received more males 70.37%. Road traffic accident reported as most common mode of injury by literature, 80% in study by GorkalA[24] and Kulkarni, S.G [21] while we received 66% of same.

The range of knee flexion after one-year follow-up averaged at 100° with mean follow-up of 20 months by Tomić S[25] while we achieved

110°±15° flexion at knee with average time of follow-up was 59.5±17.3 weeks.

In study by Raza A [14]on basis of Rasmussen's knee functional score; which was excellent to good in 17 out of 20 cases operated by Ilizarov method at civil hospital karachi, while by non-operative method we could not achieve comparable results because of unacceptable articular step-off, depression and displacement in fracture fragments that ultimately lead to early arthritic changes in knees.

Jagdev SS [11] has nice paper on incidence of arthritic changes in knees of tibial plateau fractures; he explains that with rise in each grade the risk of arthritis goes on simultaneously. He has seen more cases of arthritis in Schatzker V and VI as compare to I,II,III and IV, the findings are comparable with our results, which showed the 33% of cases withKellgren-Lawrence grade 3 and 4 arthritic x-rays.

As talking about the real facts; these injuries affect the young generation in their productive life, majority are male dominance which run families and if maltreated by any means will have its aftereffects in his rest of life. As reported in our study, because of trauma they became dependent to others or develop early knee joint radiological changes leading to arthritis. Lot of people change occupation or become jobless. So these should be treated at its best otherwise it has worse socioeconomic and psychological effects not only on individual but for his families as well.

LIMITATIONS: Single center study with small sample size with shorter duration of follow-up and could not compare with other surgical methods to treat.

CONCLUSION:

we conclude that Schatzker V, VI tibial plateau fractures when managed conservatively in cast and splint didn't give satisfactory results and functional outcomes. About 1/3rd cases has fair to poor functional scores and are prone to develop early osteoarthritis. So it is wise to get articular joint congruency and acceptable radiological and clinical needs by surgical methods.

ETHICS APPROVAL: The ERC gave ethical review approval

CONSENT TO PARTICIPATE: written and verbal consent was taken from subjects and next of kin

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