RESEARCH

ANALYSIS OF RESULTS OF ARTHROSCOPY ASSISTED MANAGEMENT OF TIBIAL PLATEAU FRACTURES

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Abstract

Background: The most of the proximal tibia fractures are a result of high velocity collisions and falls from heighted areas. Depression fractures are common in osteoporotic bones of the elderly. Tibia fractures are a major cause of disability in the population. The objective is to study the outcome of proximal tibia fractures treated by arthoroscopy assisted plate osteosynthesis. **Materials and Methods:** A detailed history is undertaken. All necessary radiological investigations are performed. The subjects are informed of the type of injury and the type of procedure being planned along with the consent form. Proper preoperative evaluation is done. Results are tabulated and analysed. **Result:** Lateral plating and bicolumn plating was done in 30% of the cases each, Medial plating and cancellous screws was done in 15% of the cases each. Lateral plating with cancellous screws was done in 10% of the cases. Out of 20 Cases, 65% had an excellent clinical outcome, 20% had fair and 15% had poor clinical outcome. **Conclusion:** Without requiring a large arthrotomy incision, arthroscopic evaluation of fracture reduction allows for the best possible treatment of concurrent pathologies.A skilled surgeon can reduce the surgical trauma in difficult tibial plateau fractures by using arthroscopy .Tibial plateau fractures can be effectively and safely treated with arthroscopic aided fixation, particularly when they occur with concurrent injuries.

INTRODUCTION

Tibial plateau fractures are the most prevalent fractures. These fractures constitute approximately 1% of all fractures.[1] The most of the proximal tibia fractures are a result of high velocity collisions and falls from heighted areas. Depression fractures are common in osteoporotic bones of the elderly.[2,3] Tibia fractures are a major cause of disability in the population.

The knee joint is characterised by various weight bearing articular structures, ligaments and complex biochemical and mechanical factors which keep the orthopaedic surgeons worried about its dislocations, fractures and diseases.[4]

Arthroscopy aided fixation evaluates direct fracture reduction and has been used for more than 20 years by some surgeons for a variety of fracture forms.[5] Compared to broad arthrotomies and removing or raising the meniscus, arthroscopic methods less invasively view the broken articular surface.[6] An additional benefit of arthroscopy is that it enables the related intraarticular soft tissue to be immediately evaluated and treated, in addition to helping to reduce fractures. When compared to open procedures using an arthrotomy, faster recovery and more precise reductions have been recorded. For senior patients receiving arthroscopic surgery, particularly for lower energy fractures, positive outcomes have been observed.

MATERIALS AND METHODS

Study Design: This is Random Prospective study

Study Setting: Department of Orthopaedics & traumatology, Government Medical College & Hospital, Nalgonda.

Duration of Study: One year (January 2021 to January 2022).

Sample: 20 patients with tibeal plateau fractures were studied.

Inclusion Criteria

- All tibeal plateau fractures which needed operative correction.

Exclusion Criteria

- Conservative treatment for tibial plateau fractures.

Patients undergo a history assessment, clinical examination, radiographs, CT scans, and MRI scans as needed for assessment.

A detailed history is undertaken. All necessary radiological investigations are performed. The subjects are informed of the type of injury and the type of procedure being planned along with the consent form. Proper preoperative evaluation is done. Results are tabulated and analysed.

Methodology

All forms of tibial plateau fractures are treated surgically.

- X-rays before and after surgery.
- Computerized Tomography (CT) examination.
- Arthroscopy before surgery.
- Fracture reduction following soft tissue release.
- Arthroscopy after reduction to determine joint reduction.

Statistical Analysis

All the data obtained was entered in Microsoft excel and was presented in the forms of tables and graphs with simple statistics.

RESULTS

Twenty patients with tibial plateau fractures were included. Arthroscopy-assisted tibial plateau fixation was used to treat every patient. The longest follow-up duration was 18 months, while the shortest was 6 months. A 14-month median follow-up period was used. Modified Rasmussen's clinical and radiological criteria were used for follow-up scoring.

Table 1: Distribution based on Gender, age group and side of injury

Gender	Number of patients	Percentage
Males	16	80.00%
Females	4	20.00%
Age group(years)		
21-30	3	15.00%
31-40	4	20.00%
41-50	4	20.00%
51-60	6	30.00%
61-69	3	15.00%
Side of injury		
Right	12	60.00%
Left	8	40.00%
Total	20	100%

Majority of the patients belonged to the age group of 51 to 60 yrs with 30%, followed by 4% each belonging to the age group 31 to 40 and 41 to 50yrs. 3% each belonged to the age group of 21 to 30 and 61 to 69 age group. The side of injury was more so on the right side(60%) than the left side(40%).

Table 2: Distribution based on types of tibial fracture according to Schatzker's Classification

Type of fracture	Frequency	Percentage
Lateral split Fracture	1	5%
Split Fracture with depression	4	20%
Fracture with Central Depression	0	0%
Fracture of Medial Condyle	4	20%
Fracture of Medial and Lateral Condyles	7	35%
Metaphyseal and Diaphyseal Disassociation	4	20%
Total	20	100

Fractures were classified based on Schatzker's Classification. Type V tibial fracture was the most common fractures seen in 35% of the cases. Followed by Type II, IV and VI fracture which was seen in 20% of the cases each, and Type I fracture was seen in 5% of the cases.

Table 3: Distribution based on procedure done

Procedure done	Frequency	Percentage
Medial plating	3	15%
Lateral plating	6	30%
Cancellous screws	3	15%
Bicolumn plating	6	30%
Lateral plating with cancellous screws	2	10%
Total	20	100

Lateral plating and bicolumn plating was done in 30% of the cases each, Medial plating and cancellous screws was done in 15% of the cases each. Lateral plating with cancellous screws was done in 10% of the cases.

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Table 4: Distribution based on intraoperative arthroscopy findings

Intraoperative arthroscopy finding	Frequency	Percentage
Articular depression	4	57.14%
Meniscus entrapment	3	42.85%

Meniscrus entrapment was seen in 3 patients which was released arthroscopically.

Table 5: Distribution based on Clinical outcome

Clinical results	Frequency	Percentage
Very Good Outcome	12	60%
Good Outcome	0	0%
Fair Outcome	3	15%
Poor Outcome	5	25%

Out of 20 Cases, 65% had an excellent clinical outcome, 5% each had fair and 30% had poor clinical outcome.

Table 6: Distribution based on Radiological outcome

Radiological Outcome	Frequency	Percentage
Very Good Outcome	12	60%
Good Outcome	3	15%
Fair Outcome	5	25%
Poor Outcome	0	0%

Out of 20 Cases, 65% had an excellent clinical outcome, 20% had fair and 15% had poor clinical outcome.

DISCUSSION

Tibial Plateau fractures are intra-articular fractures that can result from a variety of factors, including RTA, falls from great heights, violence, etc. RTA was identified as the most frequent type of injury in this study. Due of their intricacy, their administration is still up for discussion. These fractures can be fixed using a variety of techniques. Fractures occur in people of all ages. However, the type and position of the fracture vary greatly based on a variety of circumstances, the most important of which are individual bone quality and the origin of the impact. From a social standpoint, it is important to know the prevalence of various fractures in a given community.[7]

Such knowledge can serve as a foundation for the organisation of appropriate healthcare and the implementation of preventative actions to reduce the risk of fractures. This may entail broad community structure, such as road traffic and housing conditions for the elderly, but it may also entail more targeted preventative efforts for specific risk groups.[8]

Increased preventative measures are of particular significance for fractures occurring in the senior population, which are frequently fragility fractures. The World Health Organization (WHO) has defined fragility fractures as fractures resulting due to mechanical stress/force that would not typically result in a fracture.[9]

A multitude of treatment options are available for proximal tibial fractures. In few cases, conservative management with braces or casts has been effective, but has resulted in loss of functional ability, increased duration of hospital stay and increased financial burden.[10]

In a study by Roerdink et al., 80 % of participants had Clinical Rasmussen scores of Excellent or Good.[11] The thorough assessment of the related soft tissue damage in the knee and its treatment in the same surgery are made possible by arthroscopy-assisted tibial plateau fracture fixation. 42.7 % of all tibial plateau fractures had meniscal tears. Peripheral and radial tears were the most prevalent forms. Schatzker Type IV & VI fractures were seen in 21.3% of ACL injuries. Only meniscal entrapment and no meniscal damage were seen in our investigation.

Numerous studies have noted that between 10% and 30% of individuals who were followed up for three years had considerable joint space constriction. With a maximum follow-up of 20 months for our short-term trial,[12,13] we found no evidence of joint space narrowing on x-ray.

It is preferable to employ two techniques in more complicated medial side patterns of tibial plateau fractures in order to prevent varus collapse or achieve precise medial reduction. For two cases that progressed to varus collapse and varus deformity in the follow-up, we employed lateral column plating and mediolateral cancellous screws. In these circumstances, bicolumn plating is advised. Arthroscopic assisted tibial plateau fracture fixation is challenging and has a good learning curve.

CONCLUSION

Without requiring a large arthrotomy incision, arthroscopic evaluation of fracture reduction allows for the best possible treatment of concurrent pathologies. A skilled surgeon can reduce the surgical trauma in difficult tibial plateau fractures by using arthroscopy. Tibial plateau fractures can be effectively and safely treated with arthroscopic

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aided fixation, particularly when they occur with concurrent injuries.

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