Original Article

To Evaluate the Outcome of Capsuloligamentaxsis and Percutaneous Fixation of Schatzkar's Type V and VI Tibial Condyle Fractures by Multiple K-Wires

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ABSTRACT

Objective: To evaluate the results when we are using percutaneous K-wires with pop cast in Schazkar's type V and type VI fractures under image intensifier under traction. Our hypothesis is by this method we can achieved good results with minimum complication.

Study Design: Descriptive case series study.

Place and Duration of Study: This study was conducted at the Mayo hospital Lahore from February 2018 to March 2019.

Materials and Methods: Total patients were 14 with 10 males and 4 were females. 31.4 years was the mean age of all patients and it ranges between29 to 50 years. (range;20 to 50). Schatzkar's type V and VI fractures were fixed by multiples per cutaneous closed K –wires and pop cast applied.

Results: Union occurred in all fractures. The follow up was of 24 weeks and range was from 19 to 31 weeks. Average flexion was of 115 degrees and the range was between 90 to 125 degree of the patients, the extension lag was about 5 to 10 degree in three patients. Full weigh bearing started after 15 weeks and the range of weigh bearing was from 12 to 24 weeks in all patients. there was no remarkable complication in the study. All data about pain, range of motion, flexion contracture and extension lag, valgus and Varus alignment and stability was collected. The final assessment was done with the help of KSS (Knee Society Score) criteria [16,17]. Excellent (KSS > 80) were in 4(28.57%), good (KSS 70-79) were in 5 (35.71%), fair (KSS 60-69) were in 3 (21.42%) and poor (KSS < 60) were noted in 1 (7.14%) patient.

Conclusion: Fixation of fracture Percutaneously by multiple wires is treatment of choice in Schatzkar's type V and VI with union, good range of motion and without any remarkable complication.

Key Words: Schatzkar's type V and VI, multiple K-wires, pop cast, percutaneous

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INTRODUCTION

Fractures of upper end tibia are nearly 1% of all tibia fractures. The forces responsible of injury are axil, Varus and valgus.[1] The main force is usually in axil direction. The geometry of fractures is variable according to the direction of force and the position of knee joint.

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This may be displaced or depressed. Fractures may be in medial condyle, lateral condyle or in both condyles. The fractures may be involved the metaphysis. Sometimes neuro vascular complication is associated with the fractures Schatzker classification is used for upper tibia fractures. It classifies then in 6 types. Type V and VI is associated are very notorious for complications. Type V is involved both condyles fractures and type VI is involved both condyles and metaphysis area. Most common complication associated with these fractures are compartment syndrome. neurovascular injuries. infection, and wound problems after surgeries.[2] Anatomical reduction, stable fixation and soft tissues healing are mandatory for early rehabilitation programmed and also preventing of knee joint to early osteoarthritis[3,4]. The good results can only be achieved when you are aware of the following basic knowledge of, age of the patient, mechanism of injury, soft tissue injuries bony injuries and also any nerve and vessel injuries before surgery, the 'gold standard 'treatment of these complicated fractures are open

reduction and fixation with double plates so patients can take part in early rehabilitation programmed to prevent joint stiffness but by using these implants are very notorious for wound complication.[5] When minimum invasive methods are used with the use of arthroscope one can achieve a good result[6]. Good results are being achieved by the use of external fixators. The fixators may be uniplanar or by planer or multi planer but complicated fractures are being treated well[7]. The soft tissues covering the bone is very sensitive of this area. Usually soft tissues injury of both condyle fracture is very notorious for bad results so a very scientist approach is mandatory when treating these fractures of proximal tibia otherwise the ends results of these fractures are very disappointing for the surgeon.

MATERIALS AND METHODS

This descriptive case series was conducted at Mayo Hospital Lahore from Feburary 2018 to March 2019. Patients of either gender and age ranged from 20 to 50 years with Schatzker type V and VI fracture were included in this study. While the patients having pathological fracture, open fracture and polytrauma were excluded from the study. Total 14 patients were included in the study. All patients were admitted from accident and emergency department and outpatient department Mayo hospital Lahore.

Approach: A skin traction is used for traction and counter traction because a bony traction produce a open fracture near the operative field. Elevation is done with B. Bowlar frame in 45 degree hip and knee position. When required further elevation is used. Injection 2 sum 2gram started intra venous before surgery. The condition of swelling, any blister formation and neurovascular stasis are monitor daily for at least two times a day till the operation decided All necessary investigations are done before operation. Necessary x-rays and CT- scan are mandatory in all cases. When acute symptoms subsided plain for surgery is decided

Procedure: All patients are operated usually under spinal anesthesia. All patients are put on traction table We usually use tourniquet. After under traction capsuloligamentous was done and fractures geometry is noted under image intensifier in AP and Lateral Views by using an appropriate widow on the anterior medial surface of tibia at fractures site, depressed fragments of bone are elevated. By this way all the articular surface is maintained and then bone grafting is done through the same window, The bone graft is take from the respective iliac crest .3mm size K-wires are inserted at least 1.5 cm below the joint surface, one K-wire is passed from posteromedial to the anterolateral direction; then the 2nd K-wire is passed from posterolateral to the anteromedial aspect and then at least 20 K-wires are passed from lateral to medial aspect under the articular surfaces from anterior to posterior direction . Then 2 K-wires of 3mm diameter are passed from lateral cortex of tibia. condyle to the medial cortex of shaft of tibia crossing the fracture, Then two K-wires of 3mm of diameter are passed from medial cortex of tibia condyle to the lateral cortex of the tibia shaft crossing the fracture .So now there are total 7 wires, 3 below the articular surface and 4wires crossing each other and also crossing the medial and lateral cortexes. All wires are buried under the skin. Now well molded pop cast was applied from the thigh to near the ankle while patient is under the traction, Patient is kept on the traction till the pop cast dried. When pop dried patient is removed from the traction and pop is completed up to the toe of the foot. A long window is usually made anterior of pop cast if required,

Follow up: Isometric exercises were started as the patients feel better usually on 2nd post-operative day. After 2 weeks' pop completed. After one-month post operatively pop was removed and new pop cast applied with turn buckle. Now patient was encouraged to flex and extend the knee joint with the help of turn buckle for one month. Then after two-month post operatively pop with turn buckle was removed and KAFO with hinge braces at knee joint was applied a patient is encouraged for partial weigh bearing with crutch for one month and at the same time movements at knee joint was kept on going up to maximum range. Routine x-ray is done after every 4 weeks. Full weight-bearing in started when union is noted on x-ray. Usually it takes 3 to 4 months' post operatively

RESULTS

Total patients were 14. Males were 10 males and females were 4. The means age of the patients were 31.4 years (range;20 to 50). In our study 9(64.28%) cases were male and rest of 5(35.71%) cases were females. Left knee was injured in 6 (42.58%) patients and remaining 8(57.14%) patients were involved on the right knee. The mean age of the patient noticed was 31.4 years (range 20-50 years). 8(57.14%) patients were suffered road traffic accidents while 2(14.28%) patients were pedestrian and hit by motor bike, 3(21.42%) patients were injured when they fall from a height and 1(7.14%) patient suffered when he was playing hockey. In 2 (14.26%) patients, one got other minor hand injuries and second head injury.

Soft tissue complications were noted almost in all cases. The complications may be bruising, swelling and blister formation 8 (57.14%) patients and suspected compartment syndrome is noted in 1 (7.14%) patient. Bone marrow aspiration taking from iliac crest and applied in fracture sit in 5(35.71%) cases as outpatient cases in operation theater under local anthesitha

The patients were remained admitted in the ward from 1 to 12 days before operation and the mean duration was 6 days. No any kind of complications were found during the operation. All patients were discharged from the ward from 2 to 14 days without any post-operative complications and the mean postoperative time of discharge range was 2-14 days. The follow up was done from 18 to 32 weeks and the means follow up was

about 24 weeks The average range of motion noted in all patients was about 115 degree of flexion.

Table No.1: Knee Society score

Pain (50 points)		
None	50	=50
Mild or occasional	45	
Stairs only	40	
Waling and stairs	30	
Moderate occasional	20	
Moderate continual	10	
Severe		
Range of Motion 5 degrees = 1 point	25 0	=25
Anteroposterior Stability (maximum movement in any position		=10
<5 mm	10	
5-10 mm	5	
10 mm	0	
Medial lateral stability		=15
<5 degrees	15	
6-9 degrees	10	
10-14 degrees	5	
15 degrees	0	
Deductions		=0
Flexion contracture		
5-10 degrees	2	
10-15 degrees	5	
16-20 degrees	10	
>20 degrees	15	
Extension lag		
<10 degrees	5	
10-20 degrees	10	
>20 degrees	15	
Alignment		
5-10 degrees	0	
0-4 degrees	3 points each	
11-15 degrees	3 points each	
Other		
Function Rating		
Walking		
Unlimited	50	
>10 blocks	40	
5-10 blocks	30	
<5 blocks	20	
Housebound	10	
Unable	0	
Stairs		
Normal up and down	50	=50
Normal ups down with rail	40	
Up and down with rail	30	
Up with rail; unable down	15	
Unable	0	
Deductions		=0
Cane	5	
Two canes	10	
Crutches or walker	20	
Score		
Knee Rating = 100 Function = 100 (Adapted from : Install JN, CCRR 1989, 248: 12)		

The range was noted from 90 degrees to the about 125 degrees. 3 patients (15%) have an extension lag from 5 degrees to 10 degrees this was remained till our last follow up period. The all patients started full weigh bearing from 12 weeks to 24 weeks post operatively and the mean weigh bearing time was about 15 weeks. All data about pain, range of motion flexion contractures, extension lag stability and Varus and valgus angle was collected. The final result was collected and outcome was assessed by comparing the the KSS (Knee Society Score) criteria[16,17].

In 4(28.57%) patients' excellent results were (KSS > 80) seen, in 5 (35.71%) patients' good results (KSS 70-79) were seen, in 3(21.42%) patients fair (KSS 60-69) result were seen, and in remaining 1 (7.14%) patient poor (KSS < 60) result were found. Pin tract infections was noticed in 2 (14.28%) patients and infection was treated by oral antibiotics. Foot drop was noticed in 1(7.14%) patient. This foot drop was recovered after the 6 weeks. The systemic complications and infections did not found in any patient. Soft tissue problems, wound breakdown, and functional impairment were not reported.

DISCUSSION

A good results depends on the articular surface restoration, and maintained of the biology. A stable pain free properly aligned joint is the end result of a good surgery[8].

Although a operation with Open reduction and internal fixation was usually think to be good method for a stable joint. By this method usually a good joint shape is obtained but there are a lot of risk of soft tissue insult. This insult result in wound complication and infection[9].

It was noted that all the condyle fractures are not properly reduced by ligamentotaxis and we have to open the joint, sometimes in case of reduction of the articular surface of the joint.[10]

The following options are mandatory in case of a tibia condyle fracture i.e., damage to soft t issues with articular cartilage, fracture reduction, joint stability, fixation stability, and limb alignment[11].

We are operated schazker's type V and type VI fracture which are considered to be high –energy fractured. and usually low –energy fractures are discussed as compare to these high energy fractures[12].

The condition of soft-tissue insult was also considering a very important role in final outcome. The original surgical technique was based on single anterior incision, opening the both sides of the joint. This severe soft-tissue stripping was the main reason of devascularization with end result of infection. Infection rates can be minimized if we use less invasive surgical technique; however, deep infection and soft-tissue complications is still the main problems we have to face[13].

Lee et al.[13] worked on 36 tibia condyle and all fractures were managed by less invasive system. Two patients got deep infection and one had to face skin necrosis. Most authors showing very good results of such complex fractures claims to be operated with external fixator initially to treat soft tissues problems and then they perform open reduction and internal fixation[15].

The final outcome is best achieved by achieving the best time to operate. We operated very early, before development of edema and the we found very good results.[12,13]

All are familiar the most common soft tissues injuries which consist of swelling, bruising, wounds blister formation, and compartment syndrome. In case of double plating when open reduction was done the most common complication noted are overlying soft tissue necrosis, problems with wound healing, exposure of metallic hardware and deep infection[16]. In other hand when implants with less invasive stabilization system (LISS) were used, there was high rate of postoperative malalignment and hardware irritation[17]. Babis et al., reported 85% excellent and good results in a study. He also reported (3%)deep infection, (9.1%) pin tract infection and (3%) peep venous thrombosis. He treated tibia condyle fractures due to the high energy trauma with hybrid external fixator[18]. Kataria et al. treated his patients with small wire external fixation having beaded "olive" wires. He reported good and excellent results in his 94.7% patients.[19] Muhammad AK et al., also worked with ilizerove ring fixator with olive wires. All patients suffered tibia condyle fractures and he reported excellent and good result in 81.8%[20]. Katsenis et al., treated type V and VI tibia fractures. He treated all his patients with small external fixators and olive wires. He also used minimal internal fixation in patients He reported 76% excellence and good results[21].

We used minimum hard wares. we did not open the fracture or joint. we in addition also did bone grafting. we respect the soft tissues and the bony fragment. So we got a very good results.

CONCLUSION

We recommend that close percutaneous K-wires fixation with additional bone grafting and pop cast is best treatment in our setup. This is minimum invasive with less hard wares. Although there are chances of knee stiffness but you are safe from deep infection and other wound related complications. We did not compare with other treatment methods and this is a limitation of our work, But we have provide platform for comparative study in future.

Author's Contribution:

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