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Outcome comparison of Patellectomy Vs Compression External fixation for infected compound fractures of patella

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Abstract

Background: Infected Compound patella fractures are difficult to treat in terms of scarring of subcutaneous tissue with extensor mechanism. Previously it was treated with patellectomy and authors wanted to retain the patella in view of retaining the integrity of extensor mechanism.

Aim: To compare the clinical outcome of results of patellectomy retrogradely and compression external fixation by JESS fixator prospectively- in infected compound fractures patella **Methods:** The results of previously done patellectomy cases(n=5) were compared with prospectively followed similar cases managed with compression external fixation by JESS fixators (n=5). Comparison was done with Knee society clinical scoring and range of movement of knee joint at completion of 6 months period. **Results:** The results were better with patellectomy group compared with compression external fixation group.

Keywords: Patellectomy, Compression external fixation, Knee society clinical score, infected compound patella fractures.

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Introduction

Patella fractures are not uncommon type fractures, in both active and older age group. While transverse fractures are more common , the ability to stand and walk in post injury status makes many of the people in backward areas in Southern India makes the victims to get mis treated with traditional bone setters in initial period. Among the fractures thus managed compound patella fractures get infected usually, and later they present to tertiary care centres like ours for further managed. Usually this kind of infected patella fractures are managed with patellectomy and extensor tendon repair with suction closure for one week. Retaining the patella at least to a smaller part has been postulated to increase the efficiency of extensor mechanism by means of anterior translation of pulley mechanism. In this regard we done this study by conserving the patellar fragments and vigorously treating the infection and to compare the outcome of already studied results of patellectomy in infected compound patellar fractures.

Aim

To compare the clinical outcome of infected compound patella fractures treated by patellectomy and Compression external fixation with JESS fixators.

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Materials and Methods

This study was a amphispective study. Previously the infected compound fractures of patella has been treated with patellectomy in department of Orthopedics. Five cases of such patellectomy were included retrospectively.Age range was from 34to 52 and male female ratio was 2:3.Planned to conserve the patella such cases were planned to be fixed with Compression external fixation by means of JESS fixation.Infected compound transverse fractures of patella presented at Department of Orthopedics during the year 2021 to 2022 were included and prospectively studied. The inclusion criteria were 1)Age between 20-60. 2) Compound infected wound over the patella. 3)Transverse fractures. Exclusion criteria were 1) severely comminuted patella fractures that needed patellectomy. 2) Previous knee contractures.3) Fresh compound patella fractures amenable to internal fixation. 5 cases fit in this criteria. All this 5 cases were treated elsewhere and presented in our department with evidence of severe infection. The average days of presentation was 4.4 days (3-6 days.). These five cases were prospectively followed with current intervention and studied. Age range was from 41 to 54 and male female ratio was 1:4. All cases in intervention group were given empirical antibiotics consist of Amoxyclav and gentamicin after taking culture swab. All 5 cases were taken for fixation on second day of fixation owing to stabilisation and pre anaesthetic assessment. No cases were having diabetes or other comorbidities.

On table the wounds extended longitudinal midline incision and thoroughly debrided. Then both superior and inferior fragments were fixed with transverse 1.8mm K wires through the skin medio laterally. Then Medium sized JESS distractor threaded rods with 2 holed clamps one fixed with superior wires and other with inferior wires bilaterally. Maximum compression between fragments given with JESS fixator. Then skin opposed and sutured. Drain kept and removed on 3rd day. Splint applied upto 15 days and sutures were removed after 15 days.

Postoperative knee mobilisation started as early after pain relief. Adequate antibiotics were given till discharge and patients asked to visit at ortho outpatient department once in 15 days and X-rays were taken and knee range of movement checked every time. And Radiological union time was noted and documented.

Infections subsided with antibiotics and in no patients secondary debridement or drainage needed in course of follow up upto 6 months. The first swab taken for all patients showed klebsiella/ Pseudomonas organisms and since all infections subsided we didn't include the infecting organism factor in our study. Also no pin site infections at the skin entry site encountered due to clean dressing protocol with povidone iodine gauze.

Cases of both groups were assessed with Knee society clinical score (adapted from Insall JN, CORR 1989;248:12) at the completion of 6 months and compared. In this score, Pain, Range of motion, Anteroposterior stability, Mediolateral stability, Flexion contracture, Extension lag, Alignment are included in the assessment.

Results

All the compound transverse fractures of patella fixed with JESS fixation united well. The union time ranged from 17 to 24 weeks and average being 20.4 weeks. All the fixators were removed once fracture united. The average 6 months Knee society clinical scoring in JESS group was 71 and standard deviation being 2.449 and the range being 67-73. The average 6 months Knee society clinical scoring in patellectomy group being 81.8 with standard deviation being 2.167 with range of 79-84.

The 6 months knee joint range of movement being 94 degrees in JESS group with standard deviation of 4.1833 and range being 90 to 100 degrees. The 6 months knee joint range of

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movement in patellectomy group was 115 degrees with standard deviation of 5 and range being 110 degrees to 120 degrees.

Students t test performed to compare the groups' Knee society clinical scores:

Table 1

	Mean	**Standard deviation**	**Variance**	**p value**
Exfix group	71	2.449	6	0.0000775 <0.05
Patellectomy group	81.8	2.167	4.7	

t test comparing the range of movement of groups

Table 2

	Mean	**Standard deviation**	**Variance**	**p value**
Exfix group	94	4.1833	17.5	0.0000922 <0.05
Patellectomy group	115	5	25	

The analysis says the clinical outcome was better in the patellectomy group than the external fixation group.

Discussion

The Factors that decide the outcome of infected compound patella fractures are completeness of debridement, curtailing the infection earlier, the non adhesion of extensor mechanism to the subcutaneous tissue due to post infection scarring and vigorous rehabilitation regimen.

External fixation for displaced patella has been studied by few authors. Mohammed Ismail Wardak et al. (2) has done a study on 84 closed patella fractures fixed with compression external device and had a good union less than 7 weeks duration. One patient went for fibroankylosis which needed second procedure. Dr. Kalom Jamoh et al (3) used JESS external fixation as first stage procedure and converted to internal fixation for non-union of patella and concluded this as effective method. In this study the JESS external fixation used as a tool for gradual compression. Since the peri patellar scarring would be minimal comparing the compound patella fractures, the knee range of movement will not be of problem. Bari.MM et al. (4) studied 18 closed displaced patella fractures fixed with external fixation and had come out with good results. The authors concluded that the technique has added advantage of excluding the second procedure of implant exit, usual procedure in patella fractures. Bhattacharyya et al (5) did case series study on JESS external fixation and concluded that the technique will be more useful in patients with high comorbidities who were not fit for internal fixation. Luna pizzaro D et al . (6) did a comparison study and came with conclusion of decreased complications in their novel external fixation for patella fractures. Ranjit Kr.Baruah did a modified Ilizarov fixation for failed internal fixation gave a promising result.

The external fixation for patella fractures give a assured support in gradual compression of fracture fragments, advantage of minimal soft tissue dissection and thereby giving better knee mobility in either primary or failed closed fractures. But coming to compound fractures, since the fractures take more time to unite, the prolongation of external fixation as single procedure actually lead to difficult in progress of knee mobility beyond 90 degrees which have been obtained earlier.

When decided to conserve the fragments in compound patella fractures these points to be taken care off.

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The restrictions in the study were short term follow up, smaller number of cases in each group and probable selection bias in patellectomy group.

Conclusion

Our study recommend two staged procedure, first stage of external fixation for wound infection care and second stage of internal fixation for better knee range of movement. Further it has been recommended to do larger scale study in this connection.

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