



## COMPARATIVE STUDY OF FIXATION OF TRANSVERSE PATELLA FRACTURES USING TENSION BAND WIRING AND CANNULATED CANCELLOUS SCREWS

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**ABSTRACT** Fractures of the patella are very common injuries. The methods of fixation are various but tension band wiring (TBW) is the most commonly used. Some surgeons tend to use cannulated cancellous screws (CCS) for the fixation as well. In our study we compared the results of the TBW and CCS. We included 18 patients among which 7 patients were treated with CCS and 11 patients with TBW. Excellent to good results were found in as many as 71.42% in CCS group and 72.72% among those in TBW group. We conclude that the use of CCS has no added advantage with outcomes similar to the TBW.

### KEYWORDS :

#### INTRODUCTION

Fractures of patella are very much common in adults. Transverse fractures of this bone account for most of the fractures.<sup>1,2,3,4</sup> Most of these transverse fractures are displaced and associated with failure of extensor mechanism at knee. In such cases, open reduction and internal fixation (ORIF) is the recommended treatment to restore extensor mechanism and augment fracture healing to ascertain early knee movements.<sup>5,6</sup> Among the various methods employed for the ORIF of these fractures tension band wiring (TBW) technique using K-Wires and stainless steel wires is the most commonly used.<sup>7,8,9,10</sup> TBW works by converting the tensile force into a compressive force when movements occur at the knee joint.<sup>11,12,13</sup> Secure fixation using TBW allows early mobilization, hence preventing stiffness at knee.<sup>14,15</sup> Not many instances of any serious complications and fixation failure have been witnessed.<sup>16</sup> Although, TBW is the current gold standard for the displaced transverse patella fractures, few surgeons recommend the use of cannulated cancellous screws (CCS) for the fixation of these fractures. We planned our study to compare the results of the displaced transverse patella fractures managed using TBW and CCS.

#### MATERIALS AND METHODS

We conducted a prospective, observational, comparative study in which we included 18 displaced transverse fractures of the body of patella. We segregated the patients into two groups: Group 1 (n=7) included fractures treated with CCS while as Group 2 (n=11) included fractures treated by TBW.

#### INCLUSION CRITERIA

- Age > 18 years
- Transverse (two part) fractures of the body of patella
- Extensor mechanism lag at knee

#### EXCLUSION CRITERIA

- Comminuted fractures of patella
- Longitudinal fracture of patella
- Poly-trauma patients

All the patients were properly examined to rule out any other associated injuries. Initial splintage was done and analgesia provided. X-rays of the effected knee (Anterio-posterior and lateral views) were done along with all the necessary blood workup. All the patients were operated in the emergency department at the 1<sup>st</sup> day of admission.

Surgery was performed under spinal anaesthesia. In all cases a tourniquet was used. The surgery was performed using a mid-line longitudinal incision at the knee. Open reduction and internal fixation was done using TBW or CCS. A long knee brace was given post-operatively for as long as the patient could start range of motion at knee without pain.

Post-operatively, quadriceps exercises and knee movements were started as soon as possible. Walking was started as pain allowed. Antiseptic dressings were done at 2<sup>nd</sup> and 7<sup>th</sup> post-operative day. The

sutures were removed at 2 weeks. The patients were followed every monthly for 6 months post-operatively. Outcome grading was done on the basis of knee pain, kneeling discomfort, weakness, stiffness, quadriceps girth, loss of flexion, loss of extension and decrease in extensor power.

#### RESULTS

In our study, we included 12 male and 6 female patients, with a male to female ratio of 2:1. The fractures were observed to occur among middle aged people with a mean age of 42.4 years. Excellent to good results were found in as many as 71.42% in group 1 and 72.72% among those in group 2 (Table 1). The only complication observed was infection which occurred in 1 patient in group 1 and in 1 patient from group 2. No case of fixation failure or revision surgery was observed.

**Table 1: Observed results**

Results	Group 1 (n=07)		Group 2 (n=11)	
	Patients	%	Patients	%
<b>Excellent</b>	01	14.28%	02	18.18%
<b>Good</b>	04	57.14%	06	54.54%
<b>Fair</b>	02	28.57%	03	27.27%
<b>Poor</b>	00	00.00%	00	00.00%
<b>Total</b>	<b>07</b>	<b>100%</b>	<b>11</b>	<b>100%</b>

#### DISCUSSION

Displaced transverse fractures of the body of patella are currently managed with tension band wiring (TBW), which is considered as the gold standard. However, some surgeons tend to use CCS for the fixation of these fractures.

In our study, on the basis of inclusion and exclusion criteria, we studied 18 cases of displaced transverse fractures of the body of patella from June, 2018 to October, 2019. All the fractures were closed injuries. The age of the patients in the study ranged from 25 to 74 years. Most of the patients involved in the study were aged more than 40 years. 12 males (66.66%) and 6 females (33.33%) were included in the study. The patients were divided into two groups: Group 1 (n=07) included patients which were managed with CCS where as Group 2 (n=11) included patients which were managed with TBW. The patients were followed every monthly for a period of 6 months. Subjective as well as objective grading was done to compare the results in the two groups.

71.42% patients among group 1 and 72.72% among group 2 showed excellent to good results using both subjective and objective grading. The only complication observed was infection which occurred in 1 patient in group 1 and in 1 patient from group 2. Infections were managed with daily debridement and antiseptic dressings along with proper antibiotics. No case of fixation failure or revision surgery was observed.

#### CONCLUSION

There were no significant differences in the outcome of the two groups.

Hence, we conclude that there seems to be no significant advantage of using CCS for the fixation of these fractures in comparison to TBW.

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