

A retrospective comparison of the modified tension band technique and the parallel titanium cannulated lag screw technique in transverse patella fracture

Wang Chengxue, Tan Lei, Qi Baochang, Hou Xiangfeng, Huang Yulong, Zhang Haipeng, Yu Tiecheng*

【Abstract】 Objective: To compare efficacy between the modified tension band technique and the parallel titanium cannulated lag screw technique for the transverse patella fracture.

Methods: Seventy-two patients were retrospectively analyzed aged 22 to 79 years (mean, 55.6 years) with transverse patella fractures, among whom 37 patients underwent the modified tension band and 35 patients received the titanium cannulated lag screw. Patients were followed up for 1-3 years. We analyzed the difference of operation time, complications, fracture reduction, fracture healing time, and the Iowa score for knee function between both groups.

Results: In modified tension band group, five patients had skin irritation and seven suffered wire migration, two of whom required a second operation. In comparison, there were no complications in the titanium cannulated lag screw group, which also had a higher fracture reduction rate and less operation time.

Conclusion: The parallel titanium cannulated lag screw technique has superior results and should be considered as an alternative method to treat transverse patella fracture.

Key words: *Fractures, bone; Patella; Titanium; Bone screws*

Chin J Traumatol 2014;17(4):208-213

Throughout the history of fracture care, the need to salvage or excise a transverse fractured patella made the treatment of patella fractures undergo many changes in method and surgeons' opinions.¹

Currently the most commonly used operative treatments are open reduction and internal fixation with screws, internal fixation with an anterior tension band, partial patellectomy, and total patellectomy.¹ The indication for each surgical procedure is related to the type of fracture encountered, and good results can be achieved with proper treatment.

Since an anterior tension band technique to treat patella displaced fractures was reported in the early

1950s, it has been modified by the AO group and is advocated as a dynamic and functional technique for patella fixation.² Compared with different techniques of patella cerclage and interosseous wiring in cadavers, the anterior tension band with retinacular repair gives the most stable fixation of a transverse patella fracture,³ moreover in clinical studies it allows for early active range of motion (ROM) exercises and gives satisfactory outcomes. Therefore, tension band wiring techniques seem to offer the best clinical results for the stabilization of patella fractures.⁴

New techniques used in limited clinical studies include tension bands through cannulated lag screws, variations of tension bands with cable, and bioabsorbable materials.⁴ Due to the high bone density of the patella and development of titanium cannulated lag screws (SynthesInc, West Chester, USA), some evidence shows that the screws can firmly fix the transverse patella fractures.⁵

In this study, we investigated the clinical outcome in 72 patients with transverse patella fracture treated

DOI: 10.3760/cma.j.issn.1008-1275.2014.04.005

Department of Orthopedics, First Norman Bethune Hospital of Jilin University, Changchun 130021, China (Wang CX, Qi BC, Hou XF, Huang YL, Zhang HP, Yu TC)

*Corresponding author: Tel: 86-431-85098981, Email: ti Chengyu@163.com

This study was granted by National Natural Science Foundation of China (No. 81172183 and 30500132).

with the anterior modified tension band method or parallel titanium cannulated lag screws.

METHODS

We screened patients aged 21 to 79 years treated between April 2007 and January 2012 in our hospital. The inclusion criteria were as follows: patients with closed transverse fracture of patella with fracture fragment separation of >3 mm or an articular incongruity of ≥ 2 mm, AO/OTA 34-C1 fractures (patella fractures primarily with a transverse fracture line) and AO/OTA 34-C2 fractures (transverse fractures with a single additional fragment created by a longitudinal fracture line). Patients with AO/OTA 34-C3 fractures (comminuted fractures) were excluded.

As a result, 72 patients were finally involved in this retrospective study (38 males, 34 females). The majority of the fractures resulted from a direct blow caused by falling (64 patients), followed by car crash accidents (8 patients). Patients were allocated to two groups: cannulated lag screw tension (35 patients with a mean age of 54.3 years, range, 22-76 years), and the K-wire tension band group (37 patients with a mean age of 56.1 years, range, 26-79 years). There was no significant difference in gender, mechanism of the injury or fracture classification between the two groups (Table 1).

An anterior longitudinal incision was performed in both groups. In K-wire tension band group, K-wires (2.0 mm in diameter) and steel wire (1.2 mm in diameter) were used to fix the fractures after the articular surface of the fractures were reduced with

reduction forceps under intraoperative fluoroscopy. Two parallel K-wires were drilled through from the lower pole to the superior pole of the patella, with a 2-cm space between the two wires and a 5- to 10-mm distance from the patellar articular surface. The upper end of the K-wire was bent into hooks and a 1.2-mm steel wire was threaded through both ends of the two K-wires to form a figure-of-eight tension band.

In the cannulated lag screw group, two parallel cannulated lag screw guide pins (1.3 mm in diameter) were temporarily used to fix the fractures after reduction of the articular surface was achieved. Two parallel wires were drilled through from the lower pole to the superior pole of the patella, with a 2-cm distance between two wires and a 5- to 10-mm distance from the articular surface. After drilling along the guide pin along the guide wire with a cannulated bit (2.5 mm) and measuring its depth, we screwed a 4.0-mm titanium cannulated compression screw (Synthes Inc, West Chester, USA) along the guide wire. We did not fix the first screw firmly and kept the guide wire into the screw. After we screwed the second cannulated lag screw into the patella, screws were alternately tightened and the guide wires were removed.

A posterior splint from the groin to the ankle provided sufficient immobilization during the first three weeks. Quadriceps femoris contraction exercises were started one day after the operation and straight leg raising exercise was performed within postoperative four days. At day 14, the sutures were removed, and cylinder cast was applied with the knee in extension.

Table 1. Characteristics of patients between the both groups (mean \pm SD)

Variables	Modified K-wire tension band	Titanium cannulated screw group	t value	P value
Age (yrs)	56.12 \pm 23.88	54.30 \pm 22.70	-0.297	0.732
Gender				
Male (n)	19	19	1.89	0.107
Female (n)	18	16		
AO/OTA classification				
34-C1 (n)	29	28	1.78	0.112
34-C2 (n)	8	7		
Interfragmentary gap (mm)	16.65 \pm 8.90	15.94 \pm 6.62	-0.46	0.532

Download English Version:

<https://daneshyari.com/en/article/3107243>

Download Persian Version:

<https://daneshyari.com/article/3107243>

[Daneshyari.com](https://daneshyari.com)