



## Outcome of low profile mesh plate in management of comminuted displaced fracture patella



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### ABSTRACT

**Purpose:** To assess the clinical results of using mesh plate in management of displaced comminuted fracture patella.

**Patients and methods:** Between January 2014 and October 2015, nine patients with closed displaced comminuted fracture patella were fixed using mesh plate and 2 mm mini screws.

**Results:** All fractures united after an average of 10 weeks. At final follow-up of an average 19.6 months, average postoperative Lysholm score was  $89.1 \pm 4.9$ , and average Postoperative Böstman scale was  $27.2 \pm 3.1$ . No hardware related complications were recorded.

**Conclusion:** Low profile mesh plate is a good option in management of comminuted fracture patella with good clinical outcome. This new surgical technique may be particularly useful in comminuted fractures when patellectomy would otherwise be considered.

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### Introduction

The patella is a crucial component of the extensor mechanism of the knee with one of the thickest articular cartilage in the human body (about 5.5 mm). Its main function is to increase the moment arm of the extensor mechanism of the quadriceps by 30% [1]. Fractures of the Patella account for about 1% of the skeletal injuries. Most nondisplaced fractures are managed successfully conservatively. Surgical management is indicated when the extensor mechanism of the knee is disrupted or the articular congruity is affected [2].

Tension-band wiring and cancellous screws have been the most commonly used techniques for the management of transverse patellar fractures with many options in tension band wiring configuration [3] and in the material used [4–6]. Gosal et al., found similar clinical results and fewer reoperation rates with the use of nonabsorbable sutures compared with stainless-steel wiring [4].

Fewer options are available for displaced comminuted patellar fractures including either cerclage wiring or patellectomy. Cerclage wiring doesn't allow adequate reduction with increased risk of arthritis, nor stable fixation to allow early mobilization with a high

incidence of cerclage breakage and loss of fixation [7]. Patellectomy, on the other hand, has been associated with poor long term outcome and loss of about half of quadriceps strength [8]. Even with partial patellectomy, the outcome is inversely proportional to the size of the excised fragment [9].

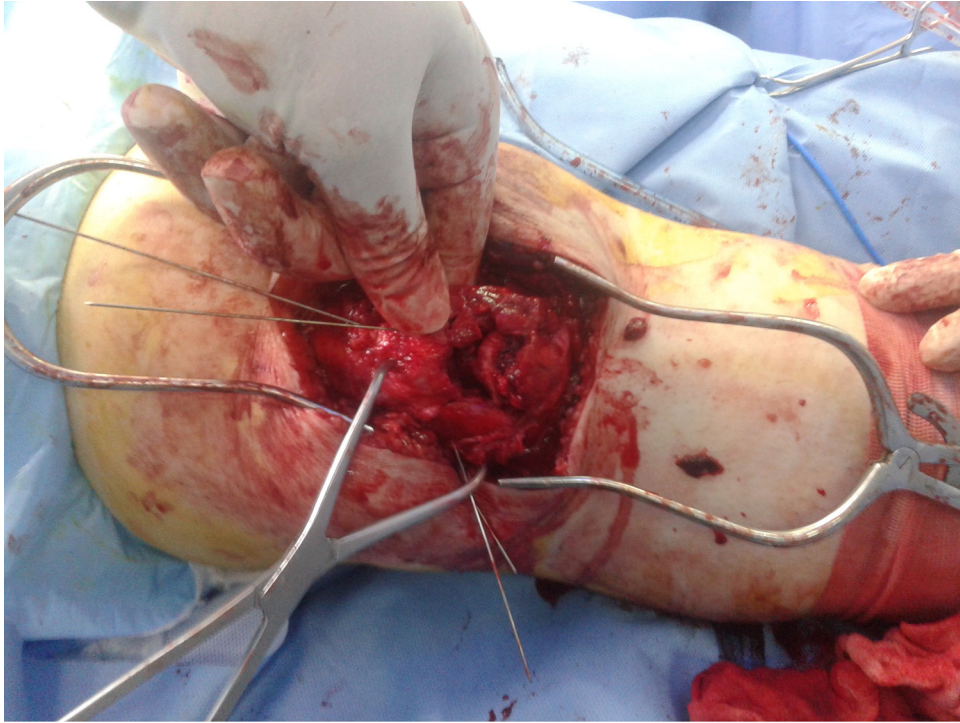
A recent biomechanical study using synthetic patellar model have shown that a low profile plate is similar to tension band wiring in transverse fracture patella when comparing ultimate force for failure and even better when comparing gap prior to failure [10]. However, there is paucity of case series published regarding clinical outcomes of plate fixation for comminuted patellar fractures. The purpose of the current study is to present our results with a new technique to preserve the highly comminuted patella using titanium mesh plate.

#### Patient and methods

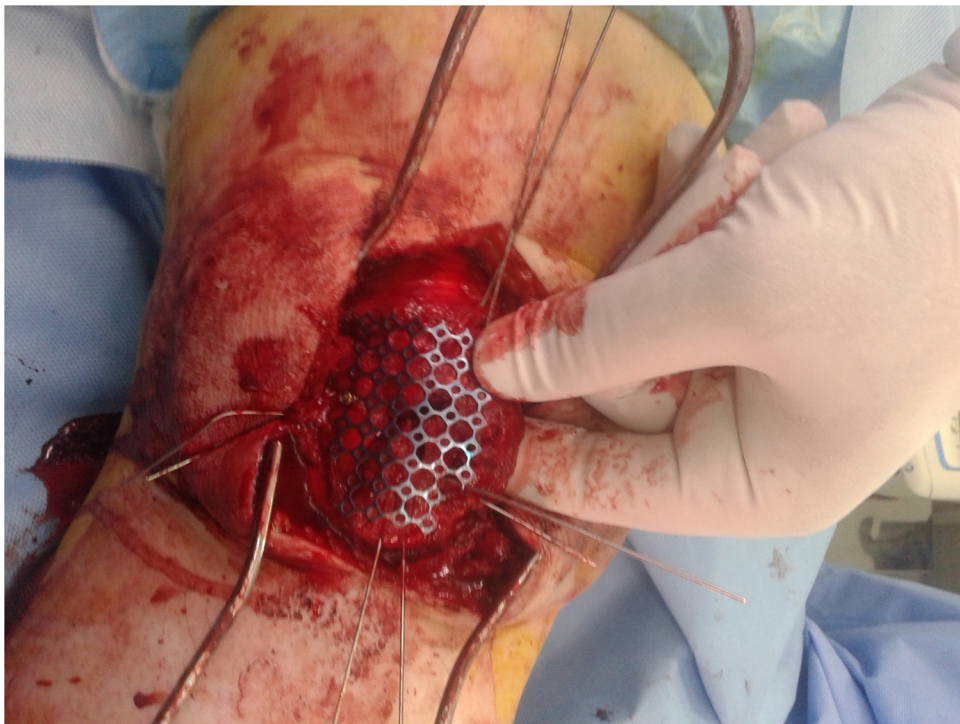
Between Jan. 2014 and October 2015, nine patients with closed displaced comminuted fracture patella were included in the current study. Exclusion criteria included patients with open fractures, concomitant knee fractures, or meniscal or ligamentous injuries requiring repair. Comminution was defined as patellar articular surface of more than 3 parts or the body of the patella more than 4 parts. Displaced fracture was defined as an articular incongruity (step-off) of more than 2 mm or separation of the fragments of more than 3 mm [11]. The study was approved by the

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**Fig. 1.** Intraoperative photograph showing preliminary reduction and fixation by multiple K-wires.



**Fig. 2.** Intraoperative photograph showing application of mesh plate.

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