

Two Staged Surgery for Gap Non-Union of Patella Fracture: A Good Alternative.

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ABSTRACT

Gap Nonunion of patella fractures are rare conditions whose treatment is challenging for surgeons. Strict protocol for such fracture gap nonunion of patella is not well documented in the literature. The decision in treatment of these conditions is based on many factors such as functional demands of the patient, factors leading to nonunion, and presence of an intact extensor mechanism of the knee. We present a case of neglected gap nonunion of a transverse fracture of patella treated at 5 months after injury with a two stage reconstruction procedure.

Keywords: Non-union, Patella fracture.

INTRODUCTION

The incidence of nonunion of patellar fractures is rarely represented in literature and ranges from 2.7–12.5%.^[1] The treatment of this Gap Nonunion is a great challenge for surgeons.

The decision in treatment of these conditions are based on the many factors such as functional demands of the patient, the factors leading to nonunion and the presence of an intact extensor mechanism of the knee for later reconstructive procedure. There is limited evidence in literature to guide surgeons how to managing gap nonunion of patella fractures.

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For the management of patella fracture gap nonunion there are many options in literature. Patients with low functional demands may be managed with non-operative methods; however, those who perform heavy physical work or participate in sports usually require operative procedure in form of open reduction and internal fixation. operative procedure includes Tension band

wiring for simple fracture, treatment by circlage wire for simple or comminuted fracture and Partial or total patellectomy for small distal fragments or in condition where satisfactory internal fixation is not possible. We here present a case of neglected gap nonunion of transverse fracture of patella treated 5 months after injury with a two staged reconstruction procedure. In first stage two fragments were brought closer by using a compressing assembly and in second stage open tension band wiring was done.

CASE REPORT

A 45-year-old male presented to outpatient department with complaint of pain, limp and knee stiffness while walking and bending of the knee after injury sustained 5 months back. On examination there was extensor lag of 30 degrees, and flexion was present till 50 degrees but was painful. There was a palpable gap of about one and a half finger between the fracture surfaces. The skin condition was normal. The patient walked with support.

On X-ray of knee anteroposterior and lateral views there was fracture of patella with gap of 2 cm between the fractured fragments [Figure 1]. Femoral condyles were normal. Patient was taken for surgery and 2 stage surgeries were planned.



Figure 1: X-ray of knee showing fracture of patella with gap between the fractured fragments.

In stage I: two 2 mm K-wires were passed transversely through each segment and connected with compressive rod assembly using adjustable external fixator system [Figure 2].

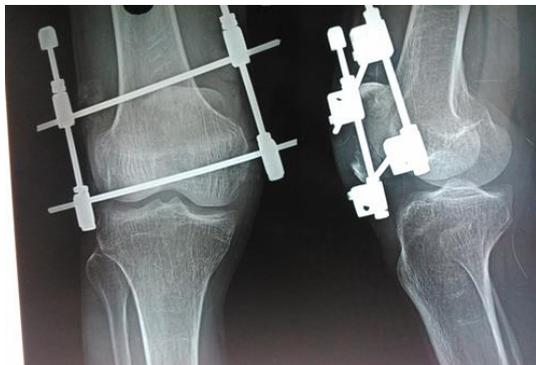


Figure 2: X-ray showing external assembly with k-wire and compression assembly.

Sequential compression was done for 11 days subsequently at the rate of 1 mm per day till total approximation was achieved. After total approximation: the wires were removed and tension band wiring was done with successful reconstruction of articular surface [Figure 3].



Figure 3: X-ray showing tension band wiring after removal of compression assembly.

Cylindrical slab was applied and full weight bearing was started with static quadriceps drill exercise. Sutures were removed at 14 day after surgery. Cast was removed at 3 weeks and gentle knee physiotherapy was started.

Patient was followed at 6 week, 3, 6, 12 month from the date of surgery. At follow up of six months, the patient had 110 degree of painless range of motion, with 10 degree extension lag which improved progressively with time with physiotherapy. There were no skin complications. X rays showed union of the fracture at 3 month [Figure 4]



Figure 4: X rays showing union of the fracture at 3 month after surgery.

DISCUSSION

There is a paucity of studies in the literature on the management of gap non-union of. Displaced fracture of patella requires operative treatment. Sometimes due to negligence or inappropriate treatment by osteopaths, patient lands into gap non-union.

The quadriceps pull is a very strong force. If fracture not treated Persistent pull over time causes contraction of the quadriceps muscle, retinaculæ and supporting ligaments. This lead to proximal pull of proximal fragment, condition leading to gap non union. The problem faced during the treatment of gap nonunion of patella fracture is to approximate fragments so that the continuity of extensor apparatus is maintained; achieving good painless knee movement while preventing any complications.

Surgeons have tried conservative treatment in the form of physiotherapy with no intention of maintaining the continuity of the extensors. This is based upon the fact that the supporting soft tissue will provide adequate strength in spite of extensor lag, so that the patient would be able to bend his knee, as well as walk with mild pain and limp.

Many studied have been done in past to compare operative and non-operative treatment of patella fracture. Klassen et al compared the operative with non-operative treatment¹. Although they got acceptable results in low demanding knee with conservative treatment, operative treatment gave improved results and increased function.

Lachiewicz^[2], and Satku et al^[3] yielded good results in single stage surgery. Uvaraj et al also in their series of 22 patients have described single stage procedure showing good results.^[4] Dhar et al^[5] reported a similar case done in two stage surgery. The case was one-year gap non-union, which was sequentially compressed using ilizarove technique and then continuity of extensor mechanism was maintained by total patellectomy. The patient had favorable outcome with 0- 135 degrees of range of motion.

As per our experience, quadriceps release is necessary in direct repair of patella fracture gap nonunion which may lead to stiff knee. Hence we decided to perform a two staged procedure avoiding the complications. The advantage is that, it has a chance of gaining full function and there is no need of V-Y/ Z-plasty. We give a chance to the quadriceps to stretch in longitudinal plane and the medial and lateral retinaculæ to expand in sagittal plane through compressible devise, maintaining the integrity of quadriceps, this gives better active extension of the knee without an extension lag. Application of compressible assembly is very easy and economical and can even be done under sedation and local anaesthesia. The disadvantage is pin tract infection.

In our case there was neither pin tract infection nor pin loosening. Patient attained about 1100 range of motion in operated knee.

CONCLUSION

Two-staged surgical method seems to be effective in treating old neglected gap nonunion patellar fracture. Patient can have intact quadriceps apparatus without extensor lag. Good functional range of motion can be achieved without causing infection or cut through.

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