



Total Knee Arthroplasty as Salvage for Non Union in Bicondylar Hoffa Fracture: a report of two cases

Venkata Gurava Reddy¹ Aditya Krishna Mootha¹ Chiranjeevi T¹ Pareen Kantesaria¹

ABSTRACT

Introduction: Bicondylar Hoffa fracture is a rare injury with implant failure and non unions as known complications.

Case report: Two cases of Bicondylar Hoffa fractures with implant failure and nonunion treated successfully with long stem total knee arthroplasty are reported here. At a minimum follow up of 2 years both the implants were well fixed and the fractures have united. The knee society scores in both the patients improved from 14 and 19 to 86 and 82 respectively. To our knowledge there are no reports of such rare fractures managed successfully with non hinged arthroplasty.

Conclusion: A long stem total knee arthroplasty can be used as a treatment option in cases of nonunion bicondylar Hoffa fractures

Keywords: Bicondylar Hoffa fracture, Hoffa nonunion, long stem total knee arthroplasty

INTRODUCTION

Bicondylar hoffa fracture is a rare injury with only a few reports so far [1-3]. It has a well documented notoriousness for its complications ranging from missed injury to implant failure and nonunion [1,3]. Patients with nonunions or acute internal fixation failure of such intra articular fractures are profoundly disabled. Options for salvage in such patients include another open reduction and internal fixation attempt, knee arthrodesis, or prosthetic replacement. In young patients with relatively good bone stock, revision

open reduction and internal fixation is preferred. For elderly patients with osteoporosis and poor bone stock or poor articular condition, prosthetic replacement is a good option. Hinged megaprotheses have been used in the past for complex distal femoral fractures either primarily or after failed internal fixation with variable results. Long stemmed total knee arthroplasty has been used for salvage of distal femoral fracture non unions [4]. However, to our knowledge there are no reports of salvage of nonunion bicondylar Hoffa fracture with long stemmed non hinged total knee arthroplasty. Here we describe 2 such cases successfully managed with long stemmed total knee arthroplasty.

CASE REPORT

Case 1

A 48 year old male presented to us with a 5 month old post traumatic stiff knee. On examination he had 40 degree flexion deformity knee with hardly any further flexion possible. Radiological evaluation revealed implant failure at the femoral condyles with posterior displacement and some degenerative changes in the joint (Fig. 1).

5 months ago he met with a road traffic accident and suffered a fracture of right shaft both bone leg (OTA 34B.3) and an ipsilateral bicondylar Hoffa fracture of the femur (OTA 33B3.2). He was initially managed outside by interlocking nail for tibial shaft and PTCS fixation of the bicondylar fracture. After counseling the patient total knee arthroplasty was planned.

A total knee arthroplasty was done under tourniquet through a medial parapatellar approach. Keeping in view the age of the patient we did a PCL substituting arthroplasty with TC-III prosthesis (Depuy) with a stem extender to enhance the constrain of the implant after removal of the pre existing hardware (Fig. 2).

¹Sunshine Hospitals, Secunderabad, India.

*Address of Correspondance

Dr. Aditya Krishna Mootha
403, Manjeera Homes, Street no.6, West Maredpalli,
Secunderabad – 260005.
Andhra Pradesh, India
Email- akmootha2005@yahoo.com
Ph – 91-9573777489.





Figure 1 : AP and Lateral radiographs of case 1 showing bicondylar Hoffa fracture nonunion with implant failure

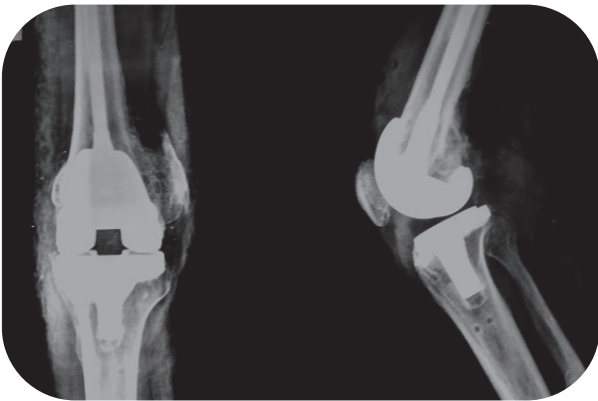


Figure 2 : AP and Lateral radiographs of same patient showing long stem total knee arthroplasty with union at fracture site.

The nonunion site was left untouched while taking the femoral cuts. The technical problems we faced were a mismatch in the flexion extension gaps. However this was expected because both the condyles with the attachments of the collateral ligaments have moved proximally and posteriorly, thus decreasing the extension and increasing the flexion space. Posterior capsular contractures secondary to long standing flexion deformity added to the gap mismatch. Hence we landed up revising the distal femoral cut by 2mm more after a partial posterior capsular release. Post operative protocol included a delayed weight bearing and unprotected full weight bearing was allowed only after 12 weeks. At final follow up of 3 years patient had a painless mobile joint with 100° range of motion. His Knee society score improved from a pre operative score of 14 to 86 post-operatively.

Case 2

A 52 year old male presented to us with a stiff painful right knee of 7 months duration. On examination

the patient had a flexion deformity of 15° and further flexion possible up to 35° which was painful. Radiographs revealed nonunion bicondylar Hoffa fracture with implant in situ (Fig. 3).



Figure 3 : AP and Lateral radiographs of case 2 showing bicondylar Hoffa fracture nonunion with implant failure

In the past he met with a road traffic accident and sustained an open fracture of the right distal femur (Gustilo & Anderson type II). Radiological evaluation revealed a bicondylar Hoffa fracture (OTA 33B3.2). The fracture was internally fixed after thorough debridement of the wound. Unfortunately the fracture got infected and after a second debridement and culture corresponding antibiotics the infection got settled but the fracture went into nonunion. At presentation to us there were no signs of active infection and even hematological parameters suggestive of infection were negative (ESR-12mm, CRP-4microgm/dl). Keeping in view the age of the patient, repeated surgeries and poor condition of the articular cartilage documented from the previous surgery, a decision of doing a total knee arthroplasty was taken after counseling the patient.

The surgery was done by the same technique as described in case 1. At final follow up of 2 years the fracture has united (Fig. 4), the patient was walking without any aid and had a 95° range of motion at knee. Knee society score improved from 19 pre-operatively to 82 at final follow up.

DISCUSSION

In 1904, Hoffa described an isolated coronal plane fracture of the posterior aspect of the femoral



Figure 4 : AP and Lateral radiographs of same patient showing long stem total knee arthroplasty with union at fracture sight.

condyle [5]. This type of fracture has been reported to involve the lateral condyle more commonly, but coronal fractures of both the condyles have been described in literature occasionally as sporadic case reports [1-3]. Bicondylar Hoffa fracture is categorized as the 33B3.2 type, according to the AO classification [6]. The best treatment for most of these lesions is open reduction and internal fixation. These fractures are notorious from management point of view and complications ranging from missed diagnosis to implant failure are well documented in literature [1-3]. Even in our experience of 9 cases (unpublished data), 2 have gone into implant failure (the present report).

For physiologically younger patients with well-preserved knee joint articular cartilage and remaining distal bone stock adequate for fixation, revision open reduction and internal fixation (ORIF) is usually the preferred treatment. However in our report of 2 cases keeping in view the age, status of the articular cartilage and patients unwillingness to undergo recurrent surgeries, total knee arthroplasty was done. Few will argue that in a young, active patient, salvage of the knee joint is preferable to prosthetic replacement. Repeated attempts to internally fix these distal fractures, however, can be difficult because of limited remaining bone and disuse osteopenia

Total knee arthroplasty with hinged mega prosthesis has been described in literature as a primary mode of treatment or as salvage for complex distal femur nonunions [7,8]. Haidukewich et al, reported a series of 17 cases where total knee arthroplasty was done for distal femur nonunions [8]. In 10 of 17 patients (59%), the distal nonunion fragment was excised

en bloc and replaced with a so-called megaprosthesis. None of the cases of their series were OTA 33B3.2 type fractures. Here in our report we document 2 such cases treated successfully with total knee arthroplasty with femoral intramedullary stem, thus avoiding the need for a megaprosthesis. Anderson et al, reported 7 cases of juxta articular nonunions of distal femur treated with long-stem total knee arthroplasty [4]. The fracture pattern was not described in them.

Nonunion of juxta articular fragments pose a great problem for the treating surgeons. The juxta articular fragment is often small and osteoporotic. Limited motion of the adjacent joint transmits added strain to the fracture site contributing to the persistence of nonunion. Here in this report we document successful management of 2 such cases of bicondylar Hoffa fracture nonunion with long stem total knee arthroplasty. Though we don't recommend this as a standard management for such cases, we wish to add to the treatment options possible for such complex situations.

CLINICAL MESSAGE -

A long stem total knee arthroplasty can be used as a treatment option in cases of nonunion bicondylar Hoffa fractures

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