Author's response to reviews

Title: Application of Ni-Ti Alloy connector for the treatment of comminuted coronal plane supracondylar-condylar femoral fractures

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Author's response to reviews: see over
We would like to express our sincere thanks to the editor and reviewers for the constructive and positive comments. The quality of written English has been checked and improved by authors and a native meticulously. We have incorporated the comments and suggestions from the reviewers into our revised manuscript and we have responded to each of the concerns and comments from the reviewers on a point-by-point basis below. All changes have been made using the "Track Changes" in revised manuscript.

**REVIEWER 1.**

**Reviewer's report**

**Title:** Application of Ni-Ti Alloy connector for the treatment of comminuted coronal plane supracondylar-condylar femoral fractures

**Version:** 2 **Date:** 20 July 2013

**Reviewer:** Rajesh K Rohilla

**Reviewer's report:**

- Needs grammatical corrections
- All comments below are major compulsory revisions

**Reviewer:** Page 4, Line 98. Eight fractures involved the lateral condyle and three involved the medial condyle. What fracture occurred in rest of ten patients.

**Authors:** We are sorry for this oversight. The sentence should have read “Eight fractures involved the lateral condyle and thirteen involved the medial condyle.” It has been changed in the updated manuscript.

**Reviewer:** Line 99. Five patients had fractures in the right knee 6 patients had fractures of the left Which side was involved in rest of ten patients?

**Authors:** The sentence should have read that 16 patients had fractures in the right knee, not 6 as originally written. We have made the appropriate change in the updated manuscript.

**Reviewer:** Page 6, Line 142. 6.5mm AP screws were used in 6 patients and 4.5mm screws were used in the remaining 5 patients What was used in rest of ten patients.

**Authors:** The sentence is now corrected and reads “6.5mm AP screws were used in 13 patients and 4.5mm screws were used in the remaining 8 patients.”

**Reviewer:** Line 147. Which criteria were used to assess union?

**Authors:** Union was defined using a combination of clinical and radiographic criteria. To be classified as union, the patient must have been able to bear weight on the limb without pain and also have obliteration of the fracture line or evidence of bridging trabeculae across the fracture line. This information is now included in the RESULTS section.

**Reviewer:** Page 7, Line 181. Arthrotomyis – arthrotomy is

**Authors:** This error has been corrected.
Reviewer: Page 7, Line 189. We feel that either the medial parapatellar arthrotomy or direct lateral approach is appropriate, medial parapatellar arthrotomy was used in how many patients, and direct lateral approach was used in how many patients - mention in results.

Authors: This information has now been included in the results section. The second sentence of the results now reads “Direct lateral approach was used 17 patients, and medial parapatellar arthrotomy was used in 4 patients.”

Reviewer: Page 8, Line 225. Screws fixing posterior femoral condyle fractures are usually placed through articular cartilage. The ASC can be placed at the lateral side to minimize the damage to the articular cartilage, which may reduce the development of post-traumatic arthritis. Document this with one intraoperative photograph or post-op radiograph.

Authors: This change was made as suggested by the reviewer. Black arrows were added to the post-op radiograph (Fig.4-e) with details in the figure legend.

Reviewer: Page 9 line 253. ASC combined with PTCS can serve as an effective means for managing comminuted fractures of the distal femoral condyle and supracondylar region. This conclusion is not based on the study results as authors included only 33B3 fractures and not comminuted fractures of distal femoral condyle and supracondylar region. Kindly be specific about type of fracture.

Authors: The sentence has been changed in the manuscript and appears as follows: “ASC combined with PTCS can serve as an effective means for managing comminuted coronal plane supracondylar-condylar femoral fractures.”

Reviewer: Fig 3 is intraoperative photograph of supracondylar fracture, it is not type 33 B3 fracture. Kindly insert photograph of type B3 fracture

Authors: Fig.3 is the intraoperative photograph of the 33 B3 fracture. The CT scans (Fig.4-c) clarify the coronal plane fracture in the right femoral condyle, while the intraoperative photograph does not show the entire femoral condyle. In this case, the fracture is classified as 33-B3 and the coronal fracture line crosses the condyle to the supracondyle of the distal femur.

Reviewer: Fig. 4 is type B1.3 fracture on the basis of radiographs. In my opinion it should have supplemental plate fixation.

Authors: Fig.4 is type 33-B3 fracture with the coronal fracture line extending from the condyle to the supracondyle of the right distal femur. The patella fracture line and projection angle may be somewhat misleading, but the classification as 33-B3 was supported by the CT scans (Fig.4-c). The CT scans more clearly show that the coronal plane fracture exists in the right femoral condyle.

Reviewer: The authors must provide preoperative and final follow up radiographs one more patient to make study more illustrative.

Authors: We have added this additional content as suggested by the reviewer. Details of the addition are provided below:
Case 2. A 34-year-old male patient presented with coronal plane supracondylar-condylar fracture of his left distal femur. (Fig.5-a). No other injuries were identified. The supracondylar-condylar fracture was anatomically reduced and fixed with three ASCs and two 6.5mm AP screws 5 days after injury. Post-operative radiographs at the final follow-up indicate the fracture healed well and there was no evidence of osteonecrosis or traumatic arthritis (Fig.5-b).

Reviewer: Articular reduction was evaluated on post operative xrays. Was image intensifier used? If not, what was the incidence of revision for accuracy of reduction and size of screws?
Articular reductions were classified as anatomical, acceptable (<2 mm step) and poor (>2 mm) based on the immediate postoperative radiographs. This method of evaluation has been previously reported. [Gavaskar, AS; Tummala, NC; Krishnamurthy, M Operative management of Hoffa fractures--a prospective review of 18 patients. Injury.2011 Dec;42(12): 1495-8]. This information has been added into the Results section.

Level of interest: An article of importance in its field
Quality of written English: Needs some language corrections before being published
Statistical review: No, the manuscript does not need to be seen by a statistician.
Declaration of competing interests:
I declare that I have no competing interests' below

**REVIEWER 2:**

**Reviewer's report**

**Title:** Application of Ni-Ti Alloy connector for the treatment of comminuted coronal plane supracondylar-condylar femoral fractures

**Version:** 2  
**Date:** 19 July 2013

**Reviewer:** Werner Kolb

**Reviewer's report:**

Minor essential revisions

**Reviewer:** Line 126 ORIF. In all cases, the fracture was well anatomically or nearly anatomically?? Reduced in flexion of knee. 4.5mm or 6.5mm

**Authors:** The recommended changes have been made in the updated manuscript. Articular reductions were classified as anatomical, acceptable (<2 mm step) and poor (>2 mm) on the immediate postoperative radiographs. This classification has previously been used to quantify the anatomical reduction [Gavaskar, AS; Tummala, NC; Krishnamurthy, M Operative management of Hoffa fractures--a prospective review of 18 patients. Injury.2011 Dec;42(12): 1495-8]. This information has been added into the Results section.

**Reviewer:** Line 149 patient (How did you measure? ALDFA and aPDFA according to Paley, D. Principles of Deformity Correction??, comminuted osteoporotic fracture and no implant failure? No secondoray loss of reduction? No delayed union or nonunion).

**Authors:** Union was defined using a combination of clinical and radiographic criteria. To be classified as union, the patient must have been able to bear weight on the limb without pain and also have obliteration of the fracture line or evidence of bridging trabeculae across the fracture line. This information is now included in the RESULTS section. Secondary loss of reduction was classified on the AP and lateral X-rays taken at each follow up visit.

**Reviewer:** Please discuss: Multifragmentary fractures of the metaphysis are reduced by indirect
means and stabilized by plates which act as bridge plates. The metaphyseal part of the fracture is never visualized. The bridge plates act as splints, the fixation is only relatively stable, and as long as the blood supply of the metaphyseal fragments is preserved, the fracture will unite rapidly with callus (Schatzker J. Supracondylar fractures of the femur in J Schatzker, M Tile (eds.) The Rationale of Operative Fracture Care, third ed., Springer 2005, pp.409-439.). Do you leave the blood supply of the metaphysis with your treatment intact?

**Authors:** We have added discussion pertaining to this technique. The following paragraph has been included in the discussion section of the updated manuscript:

“Recently, the Less Invasive Stabilization System has been developed to manage distal femur fractures. This system uses multiple, fixed-angle, distal locked screws and can be best thought of as a submuscular “internal” fixator[28]. Multifragmentary fractures of the metaphysis are reduced by indirect means and stabilized by plates, which act as bridge plates; however, the metaphyseal part of the fracture is never visualized[29]. Using the principles of minimally invasive plate osteosynthesis the plate is slid underneath the muscle and external to the periosteum[30]. This form of closed reduction without additional traumatization of the diaphyseal area leads to improved fracture healing and improved local resistance to infection[31]. However, surgical exposure of the site using this method is limited. This carries with it an inherent risk of postoperative malrotation and malalignment, especially in intra-articular fractures[31-32].”

**Reviewer:** Line 230 However, the use of these plates require wide exposure and greater disruption of the periosteum and soft-tissue (These plates are inserted submuscularly. The blood supply of the metaphyseal fragments is preserved!!).

**Authors:** The plates used in our article were not the locked periarticular plates that are used in the Less Invasive Stabilization System, but rather traditional blade plates, etc. Relative presentation and comparison between the techniques have been modified in line 251 of the updated manuscript.

**Level of interest:** An article of importance in its field

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**
I declare that I have no competing interests.