Reviewer’s report

Title: Narrow Locking Compression Plate VS Long Philos Plate for Minimally Invasive Plate Osteosynthesis of Spiral Humerus Shaft Fractures

Version: 0 Date: 08 Mar 2019

Reviewer: Henry Atkinson

Reviewer’s report:

The authors hypothesised that minimally invasive plate osteosynthesis (MIPO) using a long philos plate (LPP) would lead to better clinical and radiological outcomes and fewer complications than using narrow locking compression plates (NLCP) for spiral humerus shaft fractures with or without metaphyseal fracture extension (AO classification 12 A, B, C except A3).

They recruited 35 patients into this retrospective review over a 7 year period (January 2009 to May 2016), during which their practice changed from using the NLCP plate to using the LPP plate (17 patients).

The authors collected various data at follow-up including shoulder range of motion (ROM), pre- and post-operative anteroposterior (AP) and lateral angulation of the fractures, the operative times, the amount of blood loss, and functional outcomes including the American Shoulder and Elbow Surgeons score, University of California at Los Angeles score, and the Simple Shoulder Test scores.

The authors found that 33 of the 35 patients achieved complete bony union and achieved satisfactory functional outcomes. The LPP group had better postoperative fracture angulation on X-ray and a shorter operative time (p <0.05), though 2 LPP patients had to undergo revision surgery with an NLCP and bone grafting, due to failure of their LPP hardware.

The authors concluded that though the LPP was an easier operation, and had better fracture reduction on X-ray and a shorter operative time; one should still consider using the NLCP plate (which gives a more rigid fixation), owing to the risk of metalwork failure using the LPP (which has a weaker fixation).

Comments

1) Can the authors comment on any learning curve they had when they changed their technique from using the NLCP to the LPP?

2) I presume that the 2 LPP failures were early in their LPP series, particularly as the authors then changed their technique to add a middle compressions screw.
3) Line 155 is the addition of compression screws in the middle part of the fracture not introducing a clash of fracture fixation philosophies?

4) There have been some recent concerns raised in the use of locking plates for long-bone (lower limb) fractures, can the authors comment on whether they foresee similar problems in upper limb fracture when using long locking plates?

5) In the Results section, I don't think the authors can state that All 35 patients had bone union, as 2 had been revised. This is misleading. They can state that these 2 patients had bone union after their revision surgery. Hence 33 or 35 had bone union after the primary surgery. 2 or 35 had revision surgery and then achieved bone union! There is no mention of these 2 patients in the Results/Discussion section at all?

6) Was there a difference in blood loss and operative time statistically significant between the groups? This should be stated in the Results section.

7) Lines 225-239 really belong in the RESULTS section. One can discuss the findings but the Stats should be in the results area only

8) The Discussion section should focus much more on the two complications and why the metalwork failed. There are concerns on the use of locking plates in long bone fractures and this should be commented on; particularly as the authors mention 2 metalwork failures.

9) The authors should also discuss the advantages and disadvantages of their 2 plating systems, and focus on why they think that the LPP is better.

10) The conclusion that was drawn does not match the results.

"Even though MIPO technique using LPP is easier and more accurate reduction method, rigid fixation should be considered".

There is no discussion about the rigidity of the fixation, and no analysis of the reasons for metalwork failure. The conclusions should reflect the data from the paper.

11) There are some typos, such as "inserted" instead of "insered" Line 150, and Line 190 "symptoms" not sympoms.

Thanks

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

No

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

No

**Are the conclusions drawn adequately supported by the data shown?**
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No

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