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The outcome of unstable proximal femoral fracture treated with reverse LISS plates: Letter to the Editor

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Dear Editor,

We read with great interest the article by Shih-Jie Lin et al titled “The outcome of unstable proximal femoral fracture treated with reverse LISS plates” in the October 2016 edition of INJURY. We extend our appreciation to the authors for this study but wanted to clarify a few points regarding the message being sent out by the article and to present our viewpoint.

1. Distal femoral locking plates were among the first developed anatomical locking plates with significant success in the treatment of distal femur fractures. Since similar implants were not available for the proximal femur, we have some experience of using contoured DCPs for proximal femoral fractures because of issues with the DHS and blade plates at that time. This had limited usefulness, as the screws were not locked, but had the advantage of being inserted at a variety of angles, deep into the neck. The Locking plate concept has been a great success, with specifically designed plates being fairly successful, albeit with mixed results. One of the advantages is the creation of a fixed angle construct between plate, screw and bone, which adds significantly to the stability.

2. The proximal femur is anatomically unique, with a natural anteversion, a specific neck shaft angle and small cross sectional area of the neck; this makes usage of a fixed angle distal femur locking plate somewhat difficult. The distal femur LISS plate does not allow the screws to be inserted into the appropriate anteversion, nor can these be inserted at a correct angle into the neck, as they are fixed into a 90° insertion angle. Furthermore, the authors have propagated a concept of “purchase index”, which although a good concept with regard to stability of implant bone construct, has a limited use when an implant which is designed for horizontal placement of screws is used to insert screws which should ideally be in 15° anteversion and correspond with a 135° neck shaft angle. The authors also have projected a “baseline of the neck”, which the screws should cross for good purchase. This is an anatomical contradiction, since if you put in longer screws using the DF LISS, they would pierce the inferior neck without significantly crossing the so called baseline effectively.

The authors have also shown a failed case in figure 2, where all screws are directed inferiorly into the lower edge of the neck, thus not allowing the “significant purchase” they wanted. This is due to the specific design of the distal femur plate, with screws being inserted almost perpendicular to the plate, while the proximal femur demands a different angle of insertion.
The other case, which they show with a good “purchase index”, is a plate that has been placed fairly high up in the trochanter (fig 4); again the screw direction will limit the so called purchase index. If purchase index is the sole criteria for stability, why not modify the PFLP to have a couple of more screw holes, and direct them into the neck at correct anteversion and neck shaft angle, rather than use an implant from another area, with screw abutment against the inferior neck?

3. It is difficult to understand how the authors aimed for inserting 5 screws into the neck, which is difficult under the best of circumstances, considering the small cross section of the neck area. So many screws into the small neck may actually jeopardize the anatomy and vascularity, and may remove excessive bone, eventually causing more harm than benefit.

The proximal femur locking plate, which allows for 3 locking screws into proximal part is based on a lot of research, taking into account the anatomy and direction into which 3 screws can be inserted. The notion of the authors that more screws are always better may not be true for proximal femur; but if at all it is applied with the concept of the ‘purchase index’, the construct should have screws long enough to go into the neck and head area, which needs insertion at the correct neck shaft angle and anteversion.

4. The concept of preservation of biology is also true with the PFLP, which can also be applied with a minimally invasive technique just as LISS; since biology is preserved with both, LISS has no biological added advantage over PFLP.

5. Data compilation by the authors, and the significance of the findings is also debatable. Being a retrospective study, we have no idea how many other cases were treated by different methods over the 3 year period of patient enrolment. The authors noted 39 cases treated by reverse LISS during this time, but do not document total cases of this specific fracture treated over the same time frame. Additionally 14 of these 39 could not be followed up and we do not know the outcome of almost 35% of the cases so treated, which limits the significance of the data presented.

6. The mentioned mechanical failure rate in the study is 16%; however 8 of 25 cases reviewed had union issues, and if we consider all of them, the implant
failure rate comes out to be 24%, which is quite high. Additionally they have only discussed 6 cases and have not supplied information about the remaining 2 cases with union issues. On the other hand, there are multiple studies that have shown a much lower complication rate with the use of PFLP for unstable Proximal femur fractures with excellent clinical outcomes.$^3,4$

The study, though commendable, may give out an unsubstantiated message to young readers. It is true that problems of stability in some complex proximal femur fractures do exist, and need a solution, but using an unsuitable implant which is not designed for this area is not the answer. In our own country, some publications using the LISS DF for failed scenarios of the proximal femur have been published, but most of them accept the compromised situation they project and do not recommend it as the primary implant of choice.$^5$

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