

## Comparison of 3.5 locking compression plate fixation to 3.5 limited contact dynamic compression plate fixation

Dear Sir,

Regarding the article 'A biomechanical comparison of 3.5 locking compression plate fixation to 3.5 limited contact dynamic compression plate fixation in a canine cadaveric distal humeral metaphyseal gap model', by D. Filipowicz et al in VCOT Issue 4, 2009 (1), I wish to make the following comments:

Although the forces applied in these tests do occur in vivo, they do not occur in the same monotonous repetition as in a laboratory. The bones cannot respond as in vivo. This study produces a delimited amount of information, which in itself is not always sufficient to make certain conclusions, but can add information for the eventual making of conclusions when a lot of data is combined with insight and experience before making specific recommendations.

Regarding the interpretation of the load/deformation curves, the following: The first curve from the locking plate group shows the typical behaviour of a uniform structure with uniform elastic and then plastic deformation (2). The curve of the group collected with the dynamic compression plates (DCP) has small events of plastic deformation in the elastic deformation area of the curve. The author explains this behaviour as settling of the plate/bone construct. Although this phenomenon may have been observed in earlier tests, this does not mean that it can be merely discounted

in the eventual analysis of the performance of the constructs. If the author had run it by an engineer, he would have been told that the structure that he was testing had some significant flaws in it. The investigator should have been very cautious in the interpretation thereof. One of the most common complications with traditional DCP plates is screw loosening due to micro movement and subsequent failure of the implant bone complex (2, 3). In vivo the axial loading is often followed by distraction forces that can lead to 'unsettling', with screw toggling, loosening and implant failure (4).

There was difficulty in proper seating of some of the locking screws. Although the author mentions a couple of possible causes thereof, he fails to mention operator error with the application of the locking plate. A common occurrence when drilling on to an acute angle, as happens when the drill bit cannot be placed perpendicular to the surface of bone that is being drilled, is that drifting of the drill bit occurs and that the hole is not exactly under the drill guide. This happens more frequently if the drill bit is not perfectly sharp, or is advanced too quickly. It is therefore unfair to blame the manufacturers for this problem.

Locking plates have unique advantages and disadvantages (3). So do DCP plates. Rather than trying to prove one system better than the other, especially when applied in such a limited way, I think it would be more appropriate to merely present the data, leaving the clinically relevant recommendations to a stage where more studies are combined. To make a comment on the affordability of the new plates is inappropriate. Affordability is not only determined by the actual price of the implants. Many other factors like reduced surgical time, specific characteristics and benefits and other financial factors play a role in the affordability of a system. Although cost is usually the limiting factor in our hospital, in the majority of fracture repairs we do at the moment, we use locking plates.

A significant finding was missed in this study. Contrary to the intentional design of the locking compression plate (LCP), an unusually high number of the screws in the locking plates loosened. This was not the case in many other studies using locking plates (5–11). Possible causes are improper insertion, the torque device may have been inaccurate or the recom-

mended torque is not enough. This aspect may explain the major loss of stiffness of the LCP group during cyclical loading, as this behaviour was not found in other studies comparing the same plate types (5–11). In my opinion, this fact places some doubt about the results and conclusions of this study.

Authors must realise that their recommendations are used by an extremely large body of surgeons and students surgeons, and should therefore be made very carefully and accurately.

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## References

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*Vet Comp Orthop Traumatol* 2010; 23: 149

doi:10.3415/VCOT-09-10-0105

Received: October 11, 2009

Accepted: November 1, 2009

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