The outcome of dynamic compression plate and locking plate in osteotomy for Kienbock’s disease

Hypothesis

Whether dynamic compression plate (JMM-KYOCERA OSR plate) could hasten bone union after radius osteotomy for Kienbock’s disease in comparison with locking plate.

Materials

JMM-KYOCERA OSR plate is characterized by its gear in the center of the plate. We can extend or shorten the osteotomy site by turning the gear. (Fig 1)

Methods

During 2011 and 2017, We performed radius shortening wedge osteotomy for Kienbock’s disease in 8 hands of 8 patients. The patients consisted of 4 males and 4 females. Their average age was 46.1 years old. The follow up period ranged from 18 to 52 months. The Lichtman classification revealed five Stage3a cases and 3 were 3b. After the shortening wedge osteotomy, the radius was fixed with locking plate in 5 patients (Group L)(Synthes LCP-T plate;3, Japan Unitec Stellar I plate;2) and dynamic compression plate in 3 patients (Fig 1, Group C). The bone union was evaluated using plain X ray film, when bridging callus was confirmed both sides of radial cortex in both A-P view and lateral view. The statistical analysis was performed using non-parametric method (Mann-Whitney U test).

Result

The bone union was confirmed at 5.9 ± 1.9 months after surgery with locking plates, while it was 2.5 ± 0.5 with compression plates.(p<0.05)(Table 1) Four patients treated with locking plates required LIPUS application for promoting bone union, in contrast to no patients requiring additional treatment in compression plate group. We considered that dynamic compression plate was more useful than the ordinary locking plates because of the accelerated bone union and for no LIPUS necessity.

Discussion

In radius shortening wedge osteotomy, various fixation methods have been devised so far in order to earn bony fusion earlier. The method is to make the osteotomies in a step shape, a triangle shape, or the like. In this time, we used the conventional method to change the fixation method from the locking plate to the dynamic compression plate, and examined the postoperative bone fusion period. As a result, it was possible to significantly shorten the bone fusion period in the dynamic compression plate. The biggest factor is that crimping force can be applied to the osteotomy site.

Summery

Dynamic compression plate (JMM OSR plate) is very useful for the fixation of radius after osteotomy for Kienbock’s disease.