

### **Surgical Treatment with Locking Plate for Nonunion in Femur and Tibia**

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**Purpose:** Factors leading fractures to nonunion include instability of fracture sites, decreased biological activity, and inappropriate reduction. In a case such that the causative factor of nonunion is judged as insufficient stability, a surgical treatment to enhance stability will be selected. Although the method of fixation varies depending on the cases, after the locking plate appeared, stability by plate fixation dramatically improved and it started to be used for surgery of nonunion. However, there are relatively few reports about nonunion treatments with locking plates. The purpose of this study is to investigate the outcome of the cases that were surgically treated using the locking plate for nonunion in femur and tibia.

**Methods:** 54 patients were diagnosed as nonunion of femurs or tibias and undertook surgical treatments for nonunion of femur or tibia using locking plates in our institution from 2007 to 2017 and were able to be followed longer than 1 year postoperatively. The treatment course of these cases was investigated mainly by radiographic evaluation.

**Results:** The mean age at the time of the nonunion surgery was 51.0 years, and there were 38 males and 15 females. Among 28 femoral nonunions, 8 and 24 cases achieved radiographic bony union at 6 months and 1 year after the surgery, respectively. There was only 1 case of correction loss, which was recognized 14 months postoperatively. Three cases including the case of correction loss required reoperations; however, they eventually resulted in bony fusion. Of 25 tibial nonunion, 12 and 21 cases got bone fusion at 6 months and 1 year after surgeries, respectively. Bone fusion was finally obtained in all cases except for 1 case, which showed correction loss 14 months after surgery. However, there was no case requiring reoperation. There were 19 cases in the femur and 23 cases in the tibia using only the locking plate as the internal fixation material. In other cases, it was used in combination with intramedullary nails and so on.

**Conclusion:** In the cases of surgical treatment using locking plates for femoral and tibial nonunion, good results were generally obtained. Compared to the femur, there was a tendency that more cases were treated with only locking plates in the tibia.