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Clinical Outcome and Complications after Medial Open Wedge High Tibial Osteotomy using a Locking Compression Plate

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Summary:
In two years a result, the medial pain in the knee joints had resolved in all cases. However, three patients needed reoperation and 3 cases needed to have destroyed screw head for removal of the plate after open wedge HTO. A more precise surgical procedure may help to decrease the incidence.

Abstract:
INTRODUCTION
High tibial osteotomy (HTO) has been a useful surgical option for medial osteoarthritis (OA) of the knee. Recently, the medial open wedge HTO with a locking plate has attracted a great deal of attention. The purpose of this study was to clarify the clinical outcome and complications after medial open wedge HTO using a locking plate.

METHODS
Consecutive 77 patients (80 knees) who underwent medial open wedge HTO with a TomoFix plate (J&J) were enrolled in this study between 2010 and 2012. Inclusion criteria involved patients who had persistent pain due to medial compartment OA or spontaneous osteonecrosis of the medial femoral condyle. There were 58 women and 19 men with a mean age of 62 years (range: 42-78 years) at the time of surgery. In surgical procedure, we performed a biplanar osteotomy of the tibia. The wedged hydroxyapatite or beta-tricalcium phosphate was implanted for the opening space. Partial weight-bearing was permitted at 2 weeks after surgery. Full weight-bearing was allowed at 4 weeks after surgery. We performed clinical and radiological follow-up examinations on these patients at final follow up periods after surgery (mean 25 months, range: 11– 60 months).

RESULTS
All the patients underwent the second surgery for removal of the plate. Postoperatively, the mean Japan Orthopaedic Association score [1, 2] significantly improved from 66 to 92 points (Total score: 100 points). At the final examination, the lateral femorotibial angle (FTA) changed from 180 degrees to 170 degrees. The weight-bearing line (WBL) percentage shifted to pass through a point 69% lateral from the medial edge of tibial plateau. The Insall-Salvati ratio did not significantly change between the 2 examination periods. The mean posterior tibial slope significantly changed from 9 degrees to 12 degrees after surgery ($p<0.001$). The following complications occurred; one case of superficial wound infection, one case of nonunion, and one case of over correction. Lateral hinge fractures were observed in 22 knees: 14 cases of type I, 3 cases of type II, and 5 case of type III according to Takeuchi's classification [3]. The one patient with nonunion and the one with over correction were treated by re-HTO. The one with lateral plateau fracture was conversion to total knee arthropalsty. In addition, implant failure was observed in 7 cases (8.8%) including proximal locking screw breakage in 4 cases, distal locking screw breakage in 3 cases. The totals of 3 cases of distal locking screw breakage patients were difficult to remove the screw from the bone so that they had to be destroyed using a carbide drill.

DISCUSSION & CONCLUSION

In the final examination, the medial pain in the knee joints had resolved in all cases. However, the three patients needed reoperation and 3 cases needed to have destroyed screw head for removal of the plate. In addition, lateral hinge fractures were observed in 22 knees (27.5%) in this study. A more precise surgical procedure may help to decrease the incidence of lateral hinge fractures. Patients should be well informed about the possibility of difficulty removing the locking screw [4].

REFERENCES

[1] Yasuda et al. CORR 1992 [2] Aoki et al. JBJS Br 2006 [3] Takeuchi et al. Arthroscopy 2012 [4] Maehara et al. Injury 2013