

Tibial Tubercle Osteotomy in Revision Total Knee Arthroplasty: Contemporary Outcomes in 135 Knees

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INTRODUCTION:

Revision total knee arthroplasty (RTKA) is a complex surgery requiring adequate exposure. Tibial tubercle osteotomy (TTO) allows good exposure and reduces the complications' risks on the extensor mechanism. The purpose of this study was: 1) to determine the rates of bone healing, complications, and revisions secondary to TTO; 2) to assess the functional outcomes at mid-term of RTKA with TTO (range of motion and clinical score); 3) to identify the risk factors of TTO failure.

METHODS:

Between 2010 to 2020, 810 consecutive RTKA were included in a monocentric prospective database. Inclusion criteria of this cohort were all RTKA with a tibial tubercle osteotomy, without extensor mechanism allograft, with at least two years of follow up. A total of 135 RTKA were included, with a mean age of 65±9 years old [41-94], a mean body mass index of 29.8kg/m²±5.7 [16.8-51.8], and 49% of men. Most frequent indications for revision were: 50% infections (n=68), 25% aseptic loosening (n=34), and 13% stiffness (n=18). The tibial tubercle has been positioned in the same place in 105 patients (77.7%), has been moved proximally in 18 (13%), and medialized in 8 (7%). Bone healing was confirmed on radiographs or CT scan. Complications and revisions were evaluated at the last follow up. Functional outcomes were assessed using the Knee Society Score (KSS) and range of motion.

RESULTS:

The mean follow up was 51±26 months [24-121]. Bone healing was confirmed for 95% of patients (n=128) after a delay of 3.4±2.7months [1.5-24]. Complication rate was 15% (n=20): 9 fracture of the tibial tubercle (6.7%), 7 nonunion (5%), 2 delayed union, 1 tibial metaphyseal fracture, 1 wound dehiscence. Seven patients (5%) required eight revision surgeries (6%): 3 bone grafts of the TTO, 3 osteosyntheses, 1 extensor mechanism allograft, and 1 wound revision. The functional scores and the knee flexion were significantly improved after surgery: KSS knee preop 48.8±17 [14-100] versus KSS knee postop 79.6±20 [29-100] (p<0.001); KSS function preop 37.6±21 [0-80] versus KSS function postop 70.2±30 [0-100] (p<0.001); flexion preop 81.5°±33 [0-140] versus postop 93°±29 [0-140] (p=0.004). In total, 98% (n=132) of patients had no extension deficit. Previous TTO or septic revisions didn't significantly impact nonunion or secondary displacement. No risk factor of failure of the procedure was highlighted.

DISCUSSION AND CONCLUSION:

TTO during RTKA is an efficient procedure to improve knee exposure, with a high bone healing rate, despite significant specific complications. Functional outcomes are improved at mid-term, with a satisfying range of motion.