



Intraoperative repair for iatrogenic MCL tear due to medial pie-crusting in TKA yields satisfactory mid-term outcomes

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Abstract

Purpose This study aimed to assess the rate of iatrogenic mid-substance superficial medial collateral ligament (sMCL) tear due to the medial pie-crusting technique during varus deformity total knee arthroplasty and compare the knee society score (KSS), range of motion (ROM), and instability rate of the repaired group to the control group with intact sMCL.

Methods For this retrospective series of prospectively collected data, the multiple needle puncturing technique was performed for 653 out of the 1768 knees during algorithmic medial soft-tissue release. Iatrogenic tear was observed in 35 knees (5%); hence, repair with running locking nonabsorbable braided suture was performed. Patients were visited and reviewed both clinically and radiographically at 6 weeks, 3 months, 6 months, 12 months, and annually thereafter. Chi-square, ANOVA, Mann–Whitney, independent and paired *t* test were used to analyze the variables. *P* value < 0.05 was considered statistically significant.

Results 85% of the repaired sMCL had stable joints with a mean KSS of 88 ± 3 and a mean ROM of 103 ± 11 degrees (°). The other five patients (15%) with mean KSS of 40 ± 8 and mean ROM of $81^\circ \pm 5^\circ$ had an instability and needed to undergo a revision surgery. The control group had a mean KSS of 86 ± 15 and mean ROM of $107^\circ \pm 8^\circ$; however, 7 knees had an instability and needed a revision surgery. No significant difference was observed in terms of KSS (*P* = 0.86) and ROM (*P* = 0.64) between the control and repaired groups.

Conclusion The mid-substance sMCL tear is an important intraoperative complication of medial pie-crusting. Repairing this iatrogenic tear with nonabsorbable suture had satisfying clinical outcomes regarding the postoperative knee ROM and KSS in comparison to the control group. However, there is a chance of failure, which should be perceived by the surgeons.

Level of evidence Therapeutic studies, investigating the results of treatment, Level III.

Keywords Total knee replacement · Arthroplasty · Medial collateral ligament · Instability · Pie-crusting

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Introduction

Varus deformity is commonly observed in a majority of total knee arthroplasty (TKA) candidates [26, 33]. In these cases, medial compartment release is sometimes necessary during the surgery [25]. The algorithmic pie-crusting technique is one of the medial release methods. It was introduced by Verdonk et al. and adopted by other surgeons [17, 19, 22, 23, 34]. All of the medial release techniques, even rarely, can cause superficial medial collateral ligament (sMCL) tear [13], thereby increasing the chances of prosthesis loosening and revision surgery [5]. Tear in the mid-substance is the most common type, which can be managed by primary ligament repair with sutures [4, 20, 21, 31], augmentation/reconstruction with other tendons [15, 28, 35], or