

## Does the Length of Quadriceps Incision Affect the Recovery of Isokinetic Quadriceps Strength After Minimally Invasive Total Knee Arthroplasty: A Prospective Randomized Clinical Trial

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### Summary:

This study demonstrated that more than 4 cm of quadriceps incision caused the delayed recovery time of isokinetic quadriceps strength after MIS-TKA.

### Abstract:

#### Background:

Minimally invasive surgical (MIS) techniques are proposed in order to minimize the disruption of quadriceps mechanism after total knee arthroplasty (TKA). Although the loss of quadriceps strength and its return has been investigated extensively, none of the studies has focused on the effect of the length of quadriceps incision on its strength recovery. This study thus aimed to use an isokinetic muscle testing to objectively evaluate the time that the quadriceps strengths return to their preoperative status after MIS-TKA among the three different lengths of quadriceps incisions.

#### Methods:

Sixty patients who underwent unilateral MIS-TKA using mini-medial parapatellar technique were prospectively randomized into one of the three groups, according to the length of quadriceps incisions from upper pole of patella: group A or < 2 cm (20 knees), group B or 2-4 cm (20 knees) and group C or > 4 cm (20 knees). The isokinetic strengths of the quadriceps were assessed preoperatively and every month postoperatively until the peak torque of quadriceps strength returned to their preoperative status. Times to quadriceps strength recovery and perioperative data were compared among the three groups.

#### Results:

Patients' characteristics and perioperative data, including operative time, blood loss and hospital stay, were comparable among the three groups. There was also no significant difference in preoperative isokinetic quadriceps strengths ( $28.5 \pm 10.7$ ,  $33.2 \pm 19.8$  and  $34.5 \pm 12.8$  Nm for group A, B and C respectively,  $p = 0.646$ ). By using the Kaplan Meier method, the median times to recovery in Group A and B were 2 months. Group C used significantly more recovery time (3 months) than the other group ( $p = 0.002$ ). No any complications were detected in this study.

#### Conclusions:

This study demonstrated that more than 4 cm of quadriceps incision caused the delayed recovery time of isokinetic quadriceps strength after MIS-TKA.

#### Keywords:

Strength testing, Quadriceps recovery, Minimally invasive surgery, Total knee arthroplasty