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Comparative of Radiological and Functional Outcome After TKA Using the Measured Resection and Balanced Gap Technique

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Summary:
Both measured resection and balanced gap techniques can achieve good stability.

Abstract:
Introduction:
Stability of total knee arthroplasty (TKA) is dependent on correct and precise rotation of the femoral component. Multiple differing surgical techniques are currently utilized to perform total knee arthroplasty. There are two techniques of achieving soft gap balancing in TKA; a measured resection technique and a balanced gap technique. In this prospective comparative study, the authors evaluated rotational alignments of femoral components and flexion stabilities after TKA performed using the measured resection or gap balanced technique and compared findings. In additional, functional outcomes obtained using the two techniques were compared after a minimum follow-up of 2 years.

Methods:
Seventy-two consecutive patients, who were awaiting unilateral TKAs, were allocated alternatively to either the TKA using by measured resection or a using by balanced gap techniques. Eight patients were excluded from this study (2 patients due to refusal to participate study and 4 patients due to loss of follow-up). This left sixty-four TKAs (32 TKA by measured resection and 32 by balanced gap) with a minimum of 2 years. At final follow-up, valgus and varus laxities at 90 degrees of knee flexion were measured on radiographs taken under valgus-varus stress, and total flexion laxity was determined by summing valgus and varus laxities. In addition, the rotations of femoral components from the transepicondyalr axis were also measured on flexion radiographs. To compare clinical outcomes, range of motion, HSS scores, and WOMAC scores at final follow-up were evaluated and compared between two groups.

Results:
Mean varus laxities were 5.1° in the measured resection group and 5.7° in the balanced gap group, and mean valgus laxities were 4.0° and 3.6°, respectively without statistical significance. Mean total laxities were similar in the two groups (9.1 vs. 9.3, p=0.89). However, mean femoral component rotations were significantly different in the two groups (measured resection; 0.4° external rotation from tran-sepicondylar axis and balanced gap; 2.1° external rotation (p=0.003)). The average HSS scores were 86 points in the measured resection group, and 90 points in the balanced gap group, which showed no significant difference. Moreover, no significant inter-group differences were evident for range of motion and WOMAC scores (p=0.732, p=0.640).

Conclusion:
This study demonstrated that both measured resection and balanced gap techniques can achieve good stability at 90° of knee flexion in TKA. However, the measured resection and balanced gap techniques seem at least equal in their ability to allow surgeons to balance TKA's and short-term clinical results.