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№ 3807

Objective Quantification of Ligament Balancing Using VERASENSE in Measured Resection and Modified Gap Balance Total Knee Arthroplasty

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July 24, 2020

Objective Quantification of Soft tissue balancing using VERASENSE in Measured-resection and Gap-balancing Total Knee Arthroplasty

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Abstract

1. Introduction

The aim of this study was to evaluate: (1) objective quantification of ligament ba lancing in total knee arthroplasty, (2) types and effectiveness of additional procedures to compartment pressure, and (3) change of pressure values in both compartment th roughout the range of motion in total knee arthroplasty.

2. Methods

Eighty-four patients underwent total knee arthroplasty (TKA) using VERASENSE Knee System. TKA was performed by two techniques. Compartment pressure was re corded through the range of motion (ROM) initially, after each additional procedure, and after final implantation. Balanced knees were defined as when the compartment pressure difference was less than 15 pounds.

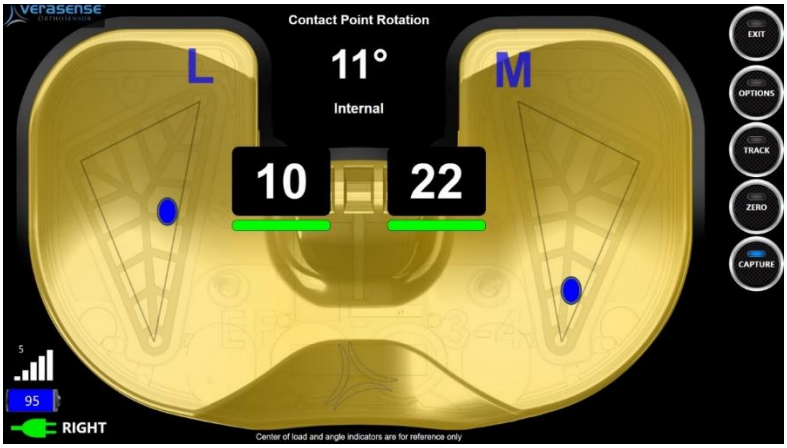

Figure 1: Quantification of medial and lateral compartment pressure using VERASENSE

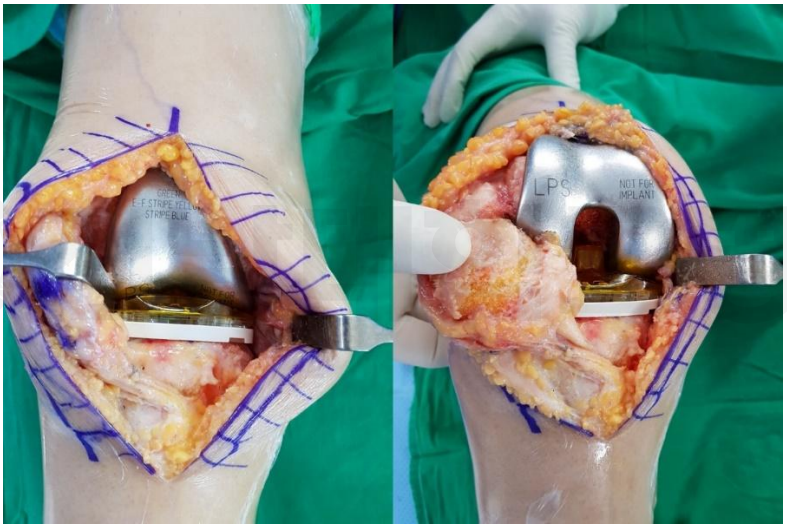

Figure 2: VERASENSE inserted in the tibial tray in extension and flexion.

3. Results

Thirty patients (35.7%) showed “balanced” knee on initial pressure measurement. Modified gap balancing TKAs showed significantly higher proportion of “balanced” k nee than measured-resection TKAs (P = 0.004). Both medial and lateral compartment pressure were generally decreased on both TKA methods. Linear correlation showed statistically significant through ROM on both compartment. Total 66 additional ligam ent balancing procedures were performed.

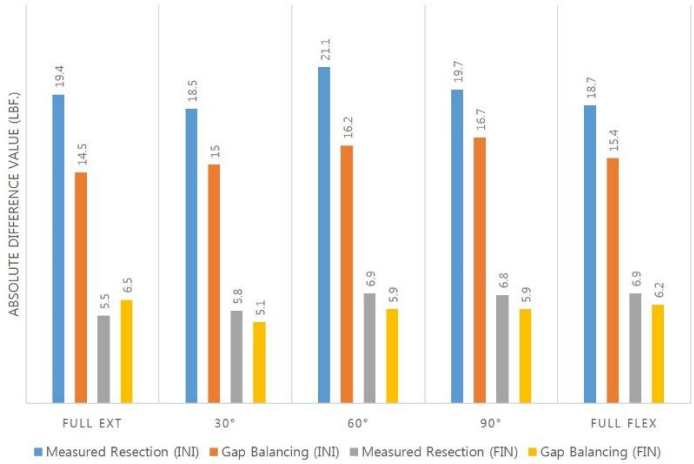

Figure 3: Initial (INI) and final (FIN) absolute mediolateral pressure difference in measured resectio n (M) and modified gap balance techniques (G)

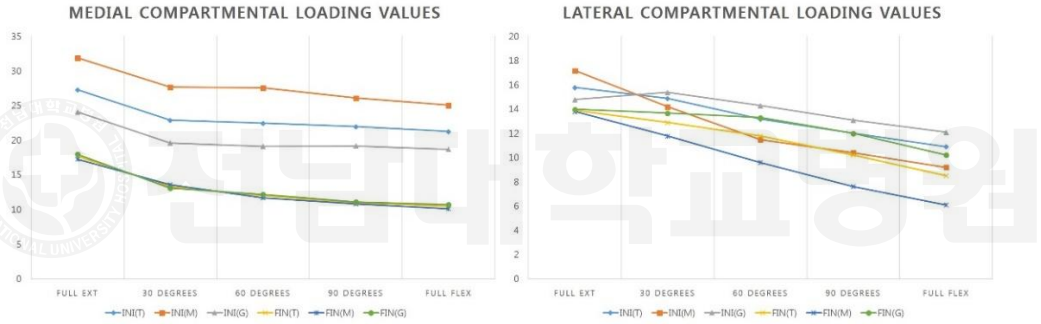

Figure 4: Initial (INI) and final (FIN) average compartment pressure of overall (T), measured resect ion (M) and modified gap balance technique (G)

4. Conclusion

Using the objective orthosensor, we were able to obtain 94% of well-balanced tot al knee arthroplasty finally. Furthermore, acquired objective data can lead to proper l igament balancing for both experienced and young surgeons and consequently reduce the complications associate with soft tissue imbalance in the future.

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