

# Kinesiotape® Application for Postoperative Edema Management After Total Knee Arthroplasty: A Case Report

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## POSTOPERATIVE EDEMA MANAGEMENT

The nature of orthopedic surgery gives rise to significant trauma and muscular tightness following TKA, in turn creating restricted fluid movement and thus edema formation. According to Gao et al, post-operative edema is most significant on days three through five following TKA. Gao and his colleagues also noted that post-operative swelling was significantly greater above the knee versus below. Current interventions for post-operative swelling include mobilization, compressive stockings, and medications. Given that acute rehabilitation goals of post-operative TKA patients include increasing ROM, pain reduction, muscle strengthening and progressive ambulation it was our clinical observation that post-operative edema was limiting progress in therapy. According to the manufacturers of Kinesiotape®, when applied with lymphatic drainage technique, the tape causes micro convolutions in the skin which causes a lifting of the skin away from tissues beneath which allows space for lymphatic fluid movement. This same concept was utilized by Tsai and colleagues in a randomized control trial which compared decongestive lymphatic therapy (usual care) to Kinesiotape® over a 4 week period in patients with breast cancer related upper extremity lymphedema. The study concluded that no significant differences were observed between these two groups. Several other studies examined the effectiveness of Kinesiotape® on lymphedema, however these interventions were focused on chronic lymphedema and not acute edema management as seen in orthopedic surgery.

With our intervention, the application of Kinesiotape® was aimed at early intervention of post-operative swelling in the acute rehabilitation setting. We began our taping upon admission to acute rehabilitation, which was post-operative day five, within the time frame for maximal post-operative swelling according to Gao et al. On this bilateral TKA patient, one knee was taped and the other knee used as an internal control. In addition to our findings of decreased circumferential swelling on the taped knee, we also saw modest improvements in ROM compared to the control. Another significant finding was improvement in post-operative bruising with the application of the Kinesiotape® (as seen in Figures 3 and 4). Given our findings, future investigation is warranted and should be aimed toward long-term effects and a more established role of Kinesiotape® in acute edema management.

### Sources:

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**Case Description:** A 71 year old female status post bilateral total knee arthroplasties secondary to advanced osteoarthritis, was admitted on post operative day 5, for a 10 day course of acute inpatient rehabilitation. Circumferential measurements were recorded daily on each knee; at the joint line, 7cm superior and 5cm inferior the joint line. Kinesiotape® was applied to the left knee, using a lymphatic drainage technique for edema management, with the right knee used as an internal control. Additionally, passive range of motion (PROM) and active range of motion (AROM) of the knee were measured on admission and discharge.

**Setting:** Hospital-based acute inpatient rehabilitation unit.

**Results:** After 10 days, the knee with application of Kinesiotape® demonstrated a reduction in total circumference at measurement sites versus an overall increase in total circumference of the control knee. Compared to admission, AROM and PROM recordings on discharge showed a greater increase in the knee with Kinesiotape® compared to the control knee. Additionally, patient had marked improvement in post-operative ecchymosis and erythema in areas underneath applied Kinesiotape®.

**Discussion:** A literature review revealed that at present, there is limited clinical evidence that Kinesiotape® is effective in edema management. Furthermore, there are no prior studies investigating the usefulness of Kinesiotape® specifically for postoperative edema management. In our patient, the application of Kinesiotape® correlated to an overall reduction in edema as well as greater improvements in range of motion.

**Conclusions:** With further investigation, Kinesiotape® applications for management of edema may be useful in augmenting or replacing current modalities in the postoperative patient.

## Results

During our patient's 10 day course of acute rehabilitation, with daily measurements, an overall decrease of leg circumference was noted on the knee with the Kinesiotape® application. Circumferential loss was most notable superior to the joint line and at the joint line (1.8 cm, 1.8 cm respectively). Conversely, an overall increase of leg circumference was noted on the control knee at the same measurement sites (1.3cm, 1.2 cm respectively).



Figure 1: Anterior view L knee, POD #5 TKA. Day #1 acute rehabilitation admission post-Kinesiotape® application.



Figure 2: Lateral view L knee. POD #5 TKA. Day #1 acute rehabilitation with overlapping pattern of Kinesiotape®.



Figure 3: Lateral view of L knee, POD #8, admission day #3. Tape removed for routine changing where Kinesiotape® was applied. with noticeable improvement in post-operative ecchymosis underneath.



Figure 4: Posterior view of L knee, POD #8, admission day #3. Figure demonstrates overlapping of Kinesiotape® application from three different sites (medial site not seen).