Sports Medicine

Evidence Matters

Research Bulletin

Stryker Hip Distraction System Exhibits Less Heel Lift than the Smith & Nephew Hip Distraction System

Top-Level Summary:

Boot Heel Lift is the distance that the bottom of the heel moves with respect to the boot when a given amount of traction is applied to the foot. It is important as a visual indicator to the end user of how well the hip distractor system – particularly the boot – is retaining the patient's foot. The foot and ankle are very vulnerable during traction, because the foot is internally rotated during the surgery as well as subjected to traction forces and pressure from the traction boot.[1] Skin irritations and neurovascular complications of the ankle and foot have been reported in relation to these variables and thus, carefully positioning, including sufficient padding of the foot and ankle, may be important to avoid such complications.[2,3] The change in heel lift over time can not only impact the patient, but also serves as a contributing factor to how well hip joint distraction can be maintained, which may impact surgery time.[4] **The Stryker Hip Distraction (SYK) System is designed to have less heel lift than the Smith & Nephew Hip Distraction (SNN) System.**

Methods:

Heel lift was measured with the Instron machine by applying a controlled ramp up to full traction, which was held for 5 min. To verify all three sizes of boot liners, the test was repeated with Sawbones foot models for all three anatomical foot models (small, medium, large), using their respective sized boot liner. Both heel lift at full traction (0-2 min) and change in heel lift from 2-5 min under full traction were measured. "Full traction" is considered 150 lbf for small feet and 200 lbf for medium and large feet.[5]

Results:

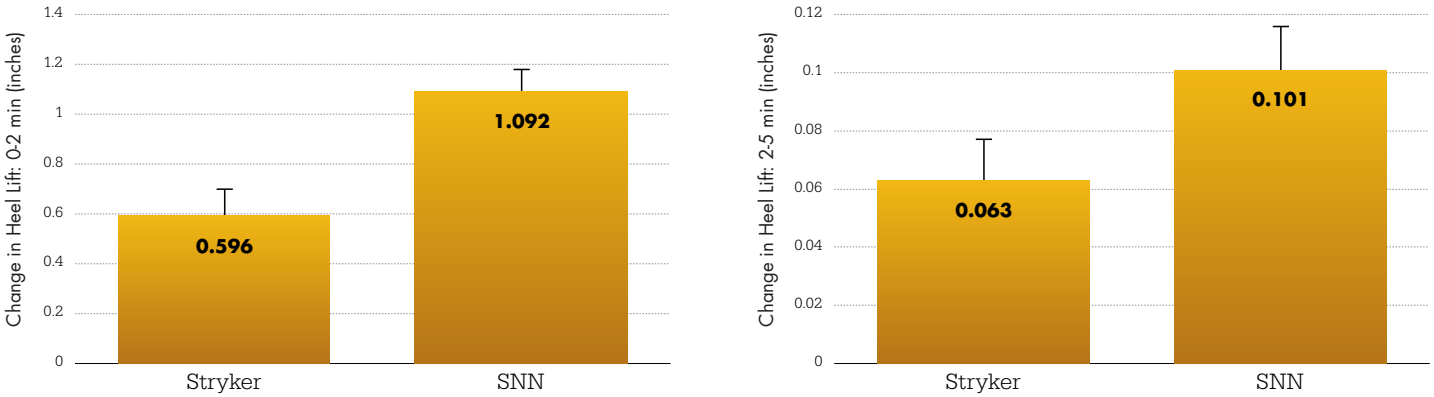

Table 1:
Heel lift at (a) full traction and (b) from 2-5 min under full traction for the SYK and SNN systems. Error bars are the standard error of the mean.

The SYK System results in significantly less heel lift than the SNN System at full traction ($p=0.0001$) and change in heel lift from 2-5 min under full traction ($p=0.0155$; Fig. 1). No significant differences in heel lift between each boot size (small, medium, large) was found for either system.

Clinical Relevance:

The decreased amount of heel lift measured when using the SYK System may make it easier to achieve and maintain adequate distraction space in the central compartment. The novel traction boots with external BOA tensioning system provide a secure attachment for the patient's foot while minimizing heel lift and slip out, eliminating the need for additional taping or Coban wrap required by competitive boots. From this perspective, the lack of heel lift and boot realignment could result in shorter surgical times and help mitigate clinical complications associated with the tight fixation of the foot in the traction boot.

References:

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