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The Effect of Knee Braces on Tibial Rotation in Anterior Cruciate Ligament – Deficient Knees During High Demand Athletic Activities

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Summary:
Knee bracing decreases the excessive tibial rotation in ACL-deficient patients during high-stress activities, although does not fully restore normative values level. If knee braces can enhance rotational knee stability in ACL-deficient patients then they could possibly play an important role in preventing further knee pathology in such patients.

Abstract:
Purpose:
To examine if bracing could considerably restrict tibial rotation in ACL-deficient patients during high loading activities.

Methods:
21 male subjects with a unilateral ACL rupture were assessed in vivo. Kinematic data were collected with an 8-camera optoelectronic system while each patient performed two tasks where increased rotational and translational loads were applied on the knee, (1) descending from a stair and subsequent pivoting, and (2) landing from a platform and subsequent pivoting, under three conditions for the deficient knee: (A) wearing a prophylactic brace (braced condition), (B) wearing a patellofemoral brace (sleeved condition) (C) without brace (unbraced condition); whether for the intact knee only without brace.

Results:
In both tasks, tibial rotation was significantly lower in the intact knee compared to all three conditions of the ACL-deficient knee ($p=0.031$). Bracing the ACL-deficient knee resulted in lower rotation than the unbraced ($p=0.001$) and sleeved ($p=0.033$) conditions. The sleeved condition resulted in lower tibial internal rotation in the drop landing and pivoting task ($p=0.019$) but not in the stair descending and pivoting task ($p=0.256$).

Conclusions:
Bracing decreased the excessive tibial rotation in ACL-injured patients during high-stress activities, but failed to fully restore normative values level.

Clinical Relevance:
If knee braces can enhance rotational knee stability in ACL-deficient patients then they could possibly play an important role in preventing further knee pathology in such patients.