TITLE: The use of tethers to mitigate proximal junctional kyphosis in adult spinal deformity.

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ABSTRACT:
Proximal junctional kyphosis (PJK) is a common problem after surgery for adult spinal deformity. Because PJK may warrant revision surgery, various preventative techniques have been proposed. Recently, posteriorly-anchored polyethylene junctional tethers have been more commonly implemented as an anti-PJK technique. In this technique, the tether is passed through the base of a vertebra cephalad to the upper instrumented vertebrae (UIV+1 or UIV+2), woven between the interspinous ligaments, and secured to rods between UIV-1 and UIV -2).

A retrospective review of a prospectively-collected single-institution database was performed of adult spinal deformity patients from 2012 to 2016, who underwent placement of a junctional tether during a posterior instrumented fusion. Radiographs obtained early postoperatively (<3 months) and at final follow up (≥12 months) were assessed for the presence of PJK. PJK was defined as a change in the Cobb angle of ≥10° between the UIV and UIV+2. In 120 patients undergoing long-segment fusions, the use of a tether was protective against PJK (OR 0.063, 95% CI [0.016–0.247], p<0.001).

PJK in tethered patients occurred more frequently in those with a larger magnitude of lumbar lordosis and UIV angle. This finding suggests that tethers may mitigate effects of segmental lumbar and focal UIV malignation that may occur after deformity correction surgery.