KEY PROCEDURES

SURGICAL REDUCTION AND FIXATION OF
TIBIAL SPINE FRACTURES IN CHILDREN:
ARTHROSCOPIC SUTURE FIXATION

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Published outcomes of this procedure can be found at: *Arthroscopy*. 2004 Feb;20(2):113-21 and *J Pediatr Orthop*. 2015 Oct-Nov;35(7):651-6.

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Abstract

The pediatric tibial spine fracture can be considered the equivalent of the pediatric anterior cruciate ligament (ACL) rupture, especially considering that failure to manage these injuries appropriately could result in substantial knee pathology and long-term functional failure. Arthroscopy-assisted internal fixation of the tibial spine fracture minimizes the patient's hospital stay compared with that associated with an open arthrotomy approach, but the postoperative rehabilitation may be paramount to a successful outcome. Compared with conservative management, surgical reduction and fixation of these fractures decreases the risks of comorbidities related to meniscal tissue entrapment, the risk of anterior impingement, and the need for revision treatment. Repair should be considered for fractures displaced >5 mm at their maximum, given the risk of revision when these cases are treated without surgery. After reduction and tentative fixation, the fracture can be managed with either suture or screw fixation. For suture fixation, the surgical steps include (1) creation of peripatellar arthroscopy portals; (2) evacuation of the hematoma and clearing of the fracture bed of meniscus and callus; (3) reduction, with particular attention paid to articular surface extension if present, and tentative fixation with an ACL tibial guide and placement of threaded Kirschner wire; (4) drilling of bone tunnels for suture passage using the tibial guide juxtaposed to the ACL insertion (both medially and laterally, in turn); (5) passing a suture of choice (nonabsorbable type requiring intraoperative fluoroscopy to evaluate tunnel placement during the previous step); (6) passage of suture both posterior and anterior to the ACL fibers; (7) removal of the tentative threaded Kirschner wire; (8) tying of the posterior suture over a bone bridge; (9) tying of the anterior suture over the same bone bridge; and (10) standard arthroscopy portal closure and placement of dressings including immobilization of the knee. For screw fixation, the surgical steps are slightly different, with Step 3 followed by (4) placement of the guidewire (if a cannulated screw is being used), (5) intraoperative assessment of the fracture reduction and drilling of the screw track perpendicular to the vector of the ACL pull and tentative threaded

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Kirschner wire fixation, (6) measurement and placement of the final screw implant, (7) removal of the tentative Kirschner wire fixation prior to final setting of the screw, and (8) standard arthroscopy portal closure and placement of dressings including immobilization of the knee. Radiographic and functional outcomes are excellent with either fixation technique in this pediatric population.

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