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Original Research

Plantar Plate Repair Using a Direct Plantar Approach: An Outcomes Analysis

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ABSTRACT

Direct plantar plate repair using a plantar approach has been described previously, but with few reports of the outcomes or clinical results. The purpose of the present study was to determine the outcomes of this technique. We performed a retrospective analysis of patients who had undergone direct plantar plate repair with or without concomitant Weil osteotomy and a prospective patient-reported subjective outcomes analysis. Ultimately, 131 patients (144 toes) were included, and the response rate for the mailed surveys was 53.5% (77 of 144 toes). The clinical outcomes reported a well-aligned toe in 87.1% of cases, with a recurrence rate of 7.6% (11 of 144) and a revision rate of 2.8% (4 of 144). Statistically significant improvement in the overall modified Foot Function Index ($p < .001$) and subscale scores for pain ($p < .001$), disability ($p < .001$), and activity limitation ($p = .001$) were noted postoperatively compared with the preoperative data. The median postoperative visual analog pain scale level reported at survey completion was 2.0 (range 0.0 to 10.0; mean \pm standard deviation 2.3 ± 2.6). Despite the modified Foot Function Index scores, the patient satisfaction questionnaire data reported mixed results. Our modified Foot Function Index results demonstrated that this approach provides excellent postoperative pain relief, improvement of associated disability, and improvement in activity limitations. The importance of managing patient expectations is acknowledged secondary to the discrepancy with the patient satisfaction data and the modified Foot Function Index results. Further prospective study is warranted to compare this technique with alternate dorsal approaches for plantar plate repair with and without associated commercially available suture passing systems.

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Surgical management of the dorsally subluxed second metatarsophalangeal joint (MTPJ) is difficult, with sometimes unpredictable long-term results. The plantar plate, a fibrocartilaginous tissue formed from the aponeurosis and joint capsule, is an important stabilizing component of the MTPJ. Injury commonly occurs from trauma, intrinsic foot deformity, inflammatory arthritis, or synovitis. Associated conditions can include hallux valgus, hammertoes, or digital contractures. Common presentations include the gradual onset of pain and swelling of the plantar MTPJ, a positive Lachman's test on examination, a feeling of a pebble in the shoe, or a bruise on the ball of the foot (1–21). On weightbearing, the toe can sublux dorsally or overlap an adjacent toe. The diagnosis is usually made clinically;

however, plain film radiographs will demonstrate the degree of subluxation or dislocation of the involved MTPJ, implying plantar plate involvement, and can help to elucidate concomitant and contributory pathologic features, such as hallux valgus or a long second metatarsal (8,9). Magnetic resonance imaging is also highly sensitive and specific for imaging of the plantar plate, with a reported sensitivity of 95% and specificity of 100% (11,17).

Initial treatment of MTPJ instability should be conservative and should include activity modification, orthotics, metatarsal pads, modified shoe gear, and toe splints. Cortisone injections are also a potential conservative therapy used by some; however, these should be considered with caution, because further attenuation of the plantar plate and involved capsular structures can result, thus increasing the deformity present. When conservative treatment fails, surgical intervention is often necessary. Conservative options provide palliative pain relief but are not curative, because the injury to the plantar plate is not addressed. Historically, the most common procedures to address instability at the MTPJ have been the Weil osteotomy,

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