Efficacy of Ultrasound-Guided Percutaneous Needle Aponeurotomy in the Management of Dupuytren's Contracture

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INTRODUCTION: Dupuytren’s contracture (DC) is a fibroproliferative disease that may present with firm nodules adhered to the palmar skin, leading to flexion deficits in the affected digit. While there is no curative treatment, percutaneous needle fasciotomy (PNF) is a standard surgical intervention for symptom management. Ultrasound-guided (USG) surgery has gained traction for minimally-invasive treatment of hand conditions due to reported pain reduction, reduced recurrence rates, and accelerated functional recovery in comparison to traditional surgeries. The outcomes of USG-PNF for DC will be explored to evaluate its efficacy and risk of adverse effects as it relates to standard PNF.

METHODS: A systematic review was conducted on OVID Medline, Cochrane Library, and Scopus databases for all studies within the past twenty years, which included data on ultrasound guided percutaneous needle aponeurotomy for the treatment of Dupuytren's contracture. Outcomes of interest were preoperative and post Quick Disabilities of Arm, Shoulder, and Hand (DASH) scores, and MCP and PIP contracture (Degrees). Secondary outcomes included complications.

RESULTS: The review included 10 studies with 1,036 patients (83% male; mean age 63.8 years) and 1,060 treated digits. MCP joints (485 joints) and PIP joints (350 joints) were the most commonly treated, with DIP joints accounting for 22 cases. Average final follow up was at 28.4 months. Following an ultrasound guided PNF, the review of papers demonstrated that MCP joint contractures improved by 15.1%, and PIP joint contractures improved by 20.7%. In aggregate, however, DIP joints demonstrated a 19% increase in contracture at final follow up. Quick DASH scores improved by 52.3%. Comprehensive complication rates across all studies revealed recurrence in 10.6% of cases, skin tears in 4.5%, postoperative pain in 2.9%, and nerve and tendon injuries each in 0.1% of cases.

DISCUSSION AND CONCLUSION: Ultrasound-guided percutaneous needle fasciotomy (USG-PNF) demonstrates promising efficacy in treating Dupuytren’s contracture, with significant improvements in MCP and PIP joint contractures and Quick DASH scores. Contracture recurrence is a particular difficulty when treating Dupuytren's contracture and can range from 12% to 47% in 5 years depending on the treatment method. This systematic review of USG-PNF demonstrated a recurrence rate 10.6% of cases, with other complications including skin tears (4.5%), postoperative pain (2.9%), and nerve or tendon injuries (0.1%). These findings suggest USG-PNF is an effective and safe option for managing Dupuytren’s contracture.