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Original article

Short-term effects of self-mobilization with a strap on pain and range of motion of the wrist joint in patients with dorsal wrist pain when weight bearing through the hand: A case series

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ABSTRACT

Dorsal wrist pain frequently occurs in weight bearing through the hand in patients with distal radius stress injuries, scaphoid impaction syndrome, and dorsal impingement. To improve the wrist extension motion, joint mobilization has been used. However, there is no report on the effects of mobilization on the range of motion (ROM) and pain onset in patients with dorsal wrist pain when weight bearing through the hand.

This study determined the effects of self-mobilization with a strap (SMWS) while weight bearing through the hand on the ROM and force generated at the onset of pain (FGOP) and intensity in the wrist joints of patients with dorsal wrist pain.

Fifteen patients (six men, nine women) with dorsal wrist pain during weight bearing through the hand were recruited from a workplace-based work-conditioning center. SMWS was applied during five visits for a 1-week period. Both passive and active wrist extension ROM, FGOP, and pain intensity (PI) while pushing down through the hand were measured before and after SMWS.

Passive and active ROM of wrist extension and FGOP increased significantly after the five sessions over 1 week of SMWS ($p < 0.05$). PI decreased significantly after the five sessions of SMWS ($p < 0.05$).

These results suggest that SMWS can be used to increase wrist extension ROM and decrease wrist pain in patients with dorsal wrist pain during weight bearing through the hand.

1. Introduction

Dorsal wrist pain has been reported to occur in more than 50% of gymnasts. In addition, dorsal wrist pain occurs frequently in workers who repeatedly use wrist extension with axial loading (Shih et al., 1995; Rettig, 2004). If there is insufficient volar gliding of the proximal carpal bones against the distal radius in the wrist, wrist extension will be limited. Limited volar gliding motion during wrist extension may produce pain due to increased compression force between the proximal carpal bones and distal radius during weight bearing through the hand or hyperextension (Clarkson, 2000, p. 198; Joy, 2011, p. 27). In particular, patients with dorsal impingement, distal radial epiphyseal stress injuries, and scaphoid impaction syndrome have reported dorsal wrist pain with axial loading (Rettig, 2004; Webb and Rettig, 2008).

To reduce dorsal pain of the wrist, conservative interventions, including resting and splinting to avoid wrist extension and non-steroidal anti-inflammatory drugs, are commonly used to reduce pain and inflammation (Rettig, 2004; Webb and Rettig, 2008). Joint mobilization, mobilization with movement (MWM), and stretching exercises have also been used to reduce pain and improve flexibility and wrist function (Tal-Akabi and Rushton, 2000; Walker, 2004; Hengeveld and Banks, 2005, p. 416–429; Cook, 2007, p. 346–350).

Traditional mobilization techniques are performed in an open kinetic chain and MWM for the wrist joint is performed with lateral gliding by a therapist while the patient actively flexes and extends the wrist. Although some studies have reported that joint mobilization, performed in an open kinetic chain position, has benefits in improving the range of motion of the wrist joint (Tal-Akabi and Rushton, 2000; Herrero Gallego et al., 2007), there is no reported evidence as to whether the increased range of wrist motion from joint mobilization in an open kinetic chain position carries over to a

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