THE EFFECTS OF BOXING GLOVE DESIGN ON THUMB POSITION WHEN MAKING A FIST FOR STRIKING

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ABSTRACT

In boxing the hand is often injured. Damage to the MP (metacarpophalangeal) and CMC (carpometacarpal) joints of the thumb are the most common reported hand injuries in boxing. It has been suggested that boxing glove design alters thumb joint angles possibly placing the thumb in a position that could increase the risk of injury. PURPOSE: To determine the effects of boxing glove design on thumb joint angles when making a fist for striking. METHODS: Ten experienced fighters (7.4 ± 3.9 years of training) participated in this study (Males = 5 and Females = 5). A DEXA scan was used to produce and x-ray image of thumb position for all conditions (no gloves and 10 oz boxing glove gloves). Subjects were asked to place their hands dorsal side down on the DEXA, then make a fist and hold position throughout the DEXA scan. Joint angles were then measured on the resulting x-ray images. Means for dependent measures (CMC, IP (interphalangeal) and MP joint angles and perpendicular distance from the 2nd metacarpal of the hand to the center of the MP joint) were compared using a paired-Sample T Test and an alpha of 0.05. RESULTS: The CMC joint angle was significantly different between no glove (14.1 ± 6.5°) and boxing glove (34.2 ± 7.6°) at p ≤ .001. The MP joint angle was significantly different between no glove (132.6 ± 12.7°) and boxing glove (149.40 ± 8.15°) at p ≤ .003. The IP joint angle was not significantly different between no glove (125.50 ± 19.12°) and boxing glove (144.40 ± 17.38°) at p ≤ .269. The perpendicular distance from the 2nd metacarpal of the hand to the center of the MP joint was significantly different between no glove (1.48 ± .54 cm) and boxing glove (1.84 ± .29 cm) at p ≤ .001. CONCLUSIONS: When making a fist without a glove all four fingers are completely flexed with the tips in contact with the palm and the thumb flexed and positioned below the flexed fingers. This position places the thumb so that it is protected and minimizes thumb contact during striking. From the data collected in this study it is apparent that boxing glove design results in a significantly altered thumb position. When making a fist, while wearing a boxing glove, the thumb is placed in a specific position resulting in abduction away from the hand and increased CMC and MP joint angles. While not directly measured in this study, this position may place the thumb at increased risk of injury as it is not as protected from impact.

INTRODUCTION

In boxing the hand is often injured. Damage to the MP (metacarpophalangeal) and CMC (carpometacarpal) joints of the thumb are the most common reported hand injuries in boxing. It has been suggested that boxing glove design alters thumb joint angles possibly placing the thumb in a position that could increase the risk of injury.