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Neurovascular Relationships to the Coracoid Process in Intact and Injured AC Joints: A Cadaveric Study Evaluating Coracoid Base and Tip Distances in Three Planes

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Introduction and Background

Neurovascular injury is a major concern during coracoclavicular (CC) stabilization for high-grade acromioclavicular (AC) joint injury. Previous anatomical studies assessing the relationship between the coracoid process and nearby neurovascular structures have been conducted in shoulders with intact AC joints, which may not represent the altered anatomy following injury. This study aimed to evaluate and compare the neurovascular relationships from both the coracoid base and the coracoid tip in shoulders with intact AC joints and those with simulated high-grade AC joint injury.

Material and Method

A full-body cadaveric study was performed to measure the distances between the coracoid base and tip and the major neurovascular structures under two conditions: intact AC joint and simulated high-grade AC joint injury. Measurements were obtained along three clinically relevant planes, including the horizontal, oblique, and vertical planes, and then compared between conditions to determine how AC joint disruption affects neurovascular proximity.

Results

Twenty full-body cadavers, including right and left shoulders from 10 male and 10 female donors, were included. High-grade AC joint injury significantly altered the spatial relationships between the coracoid base and the neurovascular structures, except in the oblique plane in the lateral decubitus position (Figure 1). Similarly, the relationships between the coracoid tip and the neurovascular structures were significantly changed in all conditions except the horizontal and oblique planes in the lateral decubitus position (Figure 2). Most measurements demonstrated reduced distances in the injured condition, particularly along the oblique and vertical planes commonly used during CC stabilization.

Conclusions

The lateral decubitus position demonstrated the highest risk of neurovascular injury during CC stabilization. The findings of this study provide injury-specific anatomical guidance that can assist surgeons in selecting the patient's position and reducing the risk of iatrogenic neurovascular injury.

Figure & Table 1.

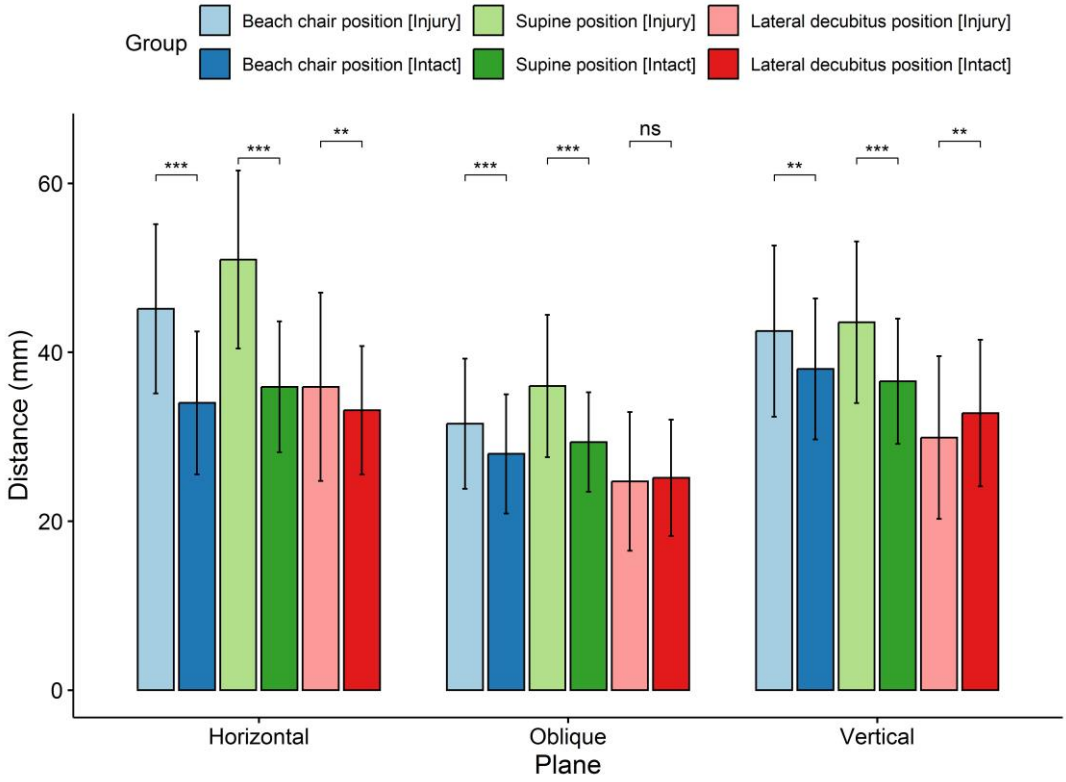

Figure & Table 2.