



Case Report

Vertical locking of the metacarpophalangeal joint of the little finger: A case report

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ABSTRACT

Locking of the metacarpophalangeal (MCP) joint is commonly caused by hyperextension of the thumb or moderate flexion of the index or middle finger. We report a rare case of vertical locking of the MCP joint of the little finger in a 16-year old female after blunt trauma to the little finger. The MCP joint was locked when positioned at approximately 90-degree-flexion and could not extend actively or passively. A manual reduction was easily achieved and no immobilization was applied. Vertical locking of the MCP joint can be easily reduced, and immobilization is unnecessary after reduction. Correct diagnosis prior to reduction and differentiation from other types of locking are essential to prevent overtreatment.

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Introduction

Locking of the metacarpophalangeal (MCP) joint is primarily comprised of two different types: a) hyperextension of the thumb, and b) moderate flexion of the index or middle finger. However, vertical locking of the MCP joint of the little finger is rare, and its mechanism remains controversial. We report a patient with vertical locking of the MCP joint of the little finger treated by simple manual reduction.

Case report

A 16-year-old female injured her left little finger with blunt trauma caused by an iron dumbbell during muscle training. Because she could not extend her MCP joint of the left little finger, she visited our hospital. The MCP joint of her little finger was locked at approximately 90-degree-flexion and could not be extended either actively or passively. X-ray imaging revealed that the MCP joint was over-flexed but not dislocated (Fig. 1); therefore, we diagnosed the patient with vertical locking of the MCP joint of the left little finger. A manual reduction was carried out without anesthesia, and the reduction was easily obtained by traction and extension of the MCP joint. Immediately after reduction, normal range of motion was obtained both passively and actively without pain, and no splint was applied.

Six months after the locking of the finger, the patient currently complains of neither pain nor functional restriction, even in sports activities.



Fig. 1. The MCP joint of the left little finger is locked at approximately 90-degree-flexion, but no dislocation is shown.

Discussion

Vertical locking of the MCP joint is rare, but reduction can be easily achieved compared to other (non-vertical) locking of the MCP joint. We believe that an easy reduction is a characteristic trait of vertical locking, and a proper diagnosis may reduce the risk of overtreatment, such as open reduction or anesthesia.

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Hyperextended locking of the thumb is caused by the volar plate that is dorsally-shifted after its proximal portion rupture,¹ while moderately flexed locking of the index or middle finger is caused by the collateral ligament getting caught to the condyle of the metacarpal head.² These two types of locking often require surgery.^{1–4} The cause of the vertical locking, on the other hand, remains controversial; however, we support the theory that an abnormal palmar cornual projection on the metacarpal head accounted for the locking of the joint.⁵ This is because manual reduction was easily obtained in the current case, and the little finger could be flexed and extended immediately after sustained reduction without symptoms. A previous article reported that no tenderness or instability was found in a similar case of vertical locking of the MCP joint, suggesting that there is no collateral ligament or volar plate injury.⁶ An easily achievable reduction is a notable trait of the vertical locking of the MCP joint, as well as the angle of the MCP joint locked at 90°.

For vertical locking of the MCP joint, we think immobilization is unnecessary after reduction. Vertical locking of the MCP joint presents no damage to the structures surrounding the joint as we have described in the prior paragraph. Although previous authors applied two weeks of immobilization in full extension of the MCP joint after manual reduction,⁶ a patient can sufficiently move

the finger without symptoms following reduction. Therefore, we believe that vertical locking of the MCP joint does not require immobilization after reduction, allowing to free the thumb or finger.

Vertical locking of the MCP joint was easily reduced by gentle traction and extension of the MCP joint. Immobilization was unnecessary after reduction because no damage occurs around the joint. It is important to accurately diagnose before reduction as patients may undergo excessive treatment including open reduction or anesthesia.

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