Hand Surgery and Rehabilitation xxx (2018) xxx–xxx

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Case report

Volar dislocation of the second and third carpometacarpal joints – the Lisfranc injury of the hand?

Luxation palmaire des deuxième et troisième articulations carpo-métacarpiennes : traumatisme de Lisfranc de la main ?

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ARTICLE INFO

Article history:
Received 16 October 2017
Received in revised form 12 June 2018
Accepted 15 June 2018
Available online xxx

Keywords:
Volar
Carpometacarpal
Dislocation
Lisfranc
Hand

Mots clés :
Palmaire
Carpo-métacarpienne
Luxation
Lisfranc
Main

ABSTRACT

A case of an isolated volar dislocation of the second and third carpometacarpal (CMC) joints in an 18-year-old man is described. He presented following a game of rugby unable to move his hand or wrist. He was managed by manipulation and K-Wire fixation. Hand function was excellent following wire removal and mobilization. This is an extremely rare injury, easily missed. The mechanism of injury described leads to comparison with the Lisfranc injury of the foot.

RÉSUMÉ

Nous présentons le cas d'une luxation palmaire isolée de la 2e et de la 3e articulation carpo-métacarpienne chez un homme de 18 ans, qui s'est présenté avec une incapacité à bouger le poignet et la main à la suite d'un match de rugby. Il fut traité par réduction par manœuvres externes et brochage. La fonction de la main était excellente après l'ablation des broches et la rééducation. Il s'agit d'une lésion rare, facilement omise. Le mécanisme lésionnel décrit amène à comparer cette lésion à celle de l'interligne de Lisfranc au pied.

1. Introduction

Hand fractures make up a large proportion of those attending the emergency department (ED), accounting for 1.5% of all ED admissions in the US [1]. Carpometacarpal dislocations account for a much lower proportion of hand injuries [2], with the vast majority of them being described in the literature as small case series and case reports.

Although there are many case reports and series describing the dorsal dislocations of the CMC joints [3], descriptions of volar dislocations in the literature appear to be much rarer. Despite the scarcity of these injuries, Buchholz et al. were keen to illustrate that these dislocations particularly at this CMC level have to be monitored closely to prevent suboptimal future outcomes associated with high energy injury and prolonged swelling [4]. With the exception of a few case reports of volar CMC dislocations of the relatively mobile thumb [5], only small numbers of CMC dislocations have been described from second to fifth fingers [6,7]. To date there has only been a couple of other case reports involving only the volar dislocation of the 2nd and 3rd CMC joints including that described by Harwin et al. [8]. These authors highlighted the importance of the firm soft tissue attachments in terms of capsule and ligament which is thought to contribute to the infrequency of this injury pattern. Harwin et al. went on to describe the joint articulations and the rigid central pillar of the hand formed by the 2nd and 3rd metacarpals [8] – this was later confirmed through kinematic analysis analyzing differences in movements arcs of the 2nd and 3rd CMC joints [9].

This case report is presented to highlight the importance of rare injuries that can potentially present to any clinician treating hand

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https://doi.org/10.1016/j.hansur.2018.06.004

Please cite this article in press as: Silk G, et al. Volar dislocation of the second and third carpometacarpal joints – the Lisfranc injury of the hand? Hand Surg Rehab (2018), https://doi.org/10.1016/j.hansur.2018.06.004

injuries. This report also presents a case for further cross-sectional imaging essential in delineating the injury pattern whilst also guiding operative management.

2. Case report and mechanism of injury

This 18-year-old right hand dominant male presented to our emergency department with right hand swelling and discomfort following a rugby injury. He gave a clear history of his injury mechanism which began as he fell onto his outstretched hand. After landing with his hand effectively planted in the ground, he remembered his metacarpophalangeal joints hyperextended, his wrist in neutral and the elbow extended. At this point another player landed over his shoulder, effectively transmitting an axial load distally through his right upper limb. With his wrist in neutral position and pronating as the force transmitted through his wrist, he sustained immediate pain and reduced function and therefore no longer able to participate. He presented shortly afterwards to our emergency department for assessment of his injury.

At the time of his initial assessment, apart from notable swelling and appropriate level of discomfort, he remained neurologically and vascularly intact distally. Interestingly, he had normal mobility of his fingers distally.

Plain radiographs were difficult to interpret but subsequent CT scan and 3D-reconstructions revealed the abnormal relationship of the CMC joints. It showed dislocations of the CMC joints limited to the 2nd and 3rd fingers, with an associated fracture through the base of the 3rd metacarpal (Fig. 1).

Due to his specific pattern of injuries, it was felt that this should be managed emergently and therefore this patient was taken to theatre later for reduction and stabilization. Fortunately, closed reduction was achieved and it was felt that this reduction could be held well with percutaneous K-wires and a well-molded plaster cast to immobilize the hand. He remained stable postoperatively

Fig. 1. Preoperative imaging. Initial lateral (a) and anteroposterior (AP) (b) X-rays. Note the disrupted Gilula arcs on AP view. 3D CT reconstruction: the CMC joints are clearly volarly subluxated (c).

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