Overlooked transscaphoid perilunate dislocation, a topic always on the table

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Summary

A 34-year-old patient suffered a right wrist injury after falling from a bicycle. He was examined at the site of trauma surgery. Despite clear X-ray signs of serious injury - trans-scaphoid perilunate dislocation - including a spilled teacup sign that was not spotted, the patient was sent home with NSAID medication and an elastic bandage. He was informed by a call the next morning that "something has been overlooked and that he should come to the Handcenter Ravensburg". The center was informed before, that a patient with an overlooked perilunate dislocation would arrive.

The patient came in the morning and the clinical examination revealed swelling, wrist pain and, beginning at night increasing median nerve compression symptoms. We proceeded with the surgical solution after performing necessary preoperative procedures and supplemental CT examination, which excluded other bone lesions in the surrounding area apart from the scaphoid fracture in its middle third part. We first operated using the posterior approach and after performing an open reduction, stabilization of the fracture with a compression screw and transfixation of the Lunotriquetral joint using two K-wires, we released the carpal tunnel using the anterior mini-incision. Plaster fixation was applied postoperatively. Eight weeks later, fixation was released, and K-wires removed. Rehabilitation process started.

As in other cases of perilunate dislocations and subsequent treatment, permanent consequences can be expected in the form of reduced range of motion and weakened muscle strength, pain and development of degenerative changes. However, due to correct treatment, anatomical reduction and adequate stabilization there is high probability that such permanent consequences will be avoided.

Introduction

Perilunate wrist dislocation is the most severe stage of perilunate injuries. The group of perilunate injuries includes purely ligamentous injuries from a scapholunate ligament lesion to a dislocation of the lunate associated with compression of the median nerve without or with a fracture of some of the adjacent bones. Mayfield divided perilunate injuries into four groups as early as in 1980 based on

a cadaveric study.[10] Although this is a well-known and discussed topic among experts there are still cases where such injuries are overlooked at routine trauma clinics. Jesse B Jupiter reports that up to 25 % of all perilunate injuries are missed during diagnosis process.[4] The consequences of such an omission can have catastrophic consequences for both wrist and hand. It is therefore necessary to constantly draw attention to this topic to raise consciousness about it among all doctors who encounter limb trauma.

The case below represents an example of overlooked transscaphoid perilunate dislocation that is hardly to believe for a handsurgeon. Fortunately, thanks to the second X-ray, the patient was informed of the diagnosis and sent to a specialized center, where he could be adequately treated. The specific method of ultimate treatment was, however, subject to a discussion. Simple closed reduction and cast immobilization should be performed only when medical reasons contraindicate surgical intervention. Early reduction and cast fixation should be done till CT scan and professional treatment is available. The treatment options include closed reduction and percutaneous fixation under arthroscopic control or open reduction and internal fixation.
Despite the anatomic reduction and an early treatment of such injuries, the risk of loss of range of motion and grip strength, recurring pain and earlier development of degenerative changes is very high due to the extent of such injuries.[2,6,7]

Case study

A 34-year-old patient suffered a right wrist injury after falling off a bike at low speed. He was examined at a trauma surgery ambulance. Probably due to a relatively low-energy trauma and insignificant clinical findings the patient was sent home only with NSAID and elastic bandage, despite unambiguous X-ray signs of a serious injury - trans-scaphoid perilunate dislocation - including a spilled teacup sign which was not recognized. According to the patient, the wrist hurt but he considered it an adequate body response to the nature of the injury and did not attach much importance to it.

The patient was informed by telephone the next morning that "something had been overlooked and that he should come to the Handcenter Ravensburg". The center was informed that a patient with an overlooked perilunate dislocation would arrive. The patient arrived the next morning as scheduled. The clinical examination revealed swelling, wrist pain and gradually progressing paresthesia of I.-III. finger, which started to manifest most probably during the night. When directly asked the patient stated the pain was manageable and he could sleep at night after taking ibuprofen 600 mg. CT examination was supplemented at a specialized workplace. Apart from the scaphoid fracture in the middle third part, which was already evident from the native X-rays, the supplemental CT examination precisely showed the carpal dislocation but no additional fracture.

We operated in axillary plexus anesthesia, using a tourniquet in a bloodless area, initially utilizing the posterior approach. Using a traction and a manual reduction the lunate with the proximal pole of

the scaphoid was repositioned. The scapholunate ligament was intact. We performed scaphoid osteosynthesis after anatomic reduction with the cannulated compression screw from the proximal pole. Utilizing optical and x-ray control, we reduced the lunotriquetral joint and stabilized it with two K wires. In addition, we performed a median nerve decompression from the volar mini incision. Postoperatively, the patient received a plaster cast.

Already during the first postoperative check-up, after the anesthesia plexus subsided, the paresthesia of the I.-III finger also disappeared. Eight weeks later, the cast was removed, the K wires were extracted, and rehabilitation was started. As in other cases of perilunate dislocations and their treatment, it is possible to expect a reduction in the range of motion and a weakening of muscle strength, or pain and earlier development of degenerative changes. However, due to the performed treatment and anatomical reduction and stabilization achieved, a much smaller range of negative consequences can be expected.

Discussion

Neglecting any fracture or ligament injury and subsequent inadequate treatment can lead to pain and permanent limitations of the patient and subsequently to legal consequences for the faulty professional. This strongly applies for wrist injuries, especially in case of perilunate dislocations due to soft tissue devastation. Herzberg reports errors in the diagnosis of perilunate injuries,[3] Çolak then finds a causal link between the number of undiagnosed injuries and level of experience of the attending physician.[1] As already stated previously, it is therefore essential to constantly raise awareness of these not so rare injuries in order to be diagnosed early, allowing an adequate treatment.

Regarding the method of treatment of perilunate dislocations, there is a clear consensus in the current literature on the need for immediate reduction and stabilization of individual components of injury. On the specific method of treatment, however, the current authors differ slightly. This holds for either closed reduction and arthroscopically assisted percutaneous pinning, which is highlighted by many authors,[8,12,13] or open reduction and internal fixation, which most authors still prefer. We believe that especially by using the approach of open reduction and internal fixation we are able to achieve complete recognition of all bone and soft tissue damage, removal of interposed soft tissue, removal of unstable chondral fragments, and can achieve accurate reduction of bone displacement, and suture of repairable ligaments.[15] To reconstruct fibrous lesions the methods of direct suture and bone reinsertion are used,[14] or an internal brace treatment method is documented.[5] We do not use this method due to previous negative experience with internal brace in SL ligament reconstruction.

Regarding the surgical approach, the literature mentions the possibility of treatment from a) palmar approach[9] enabling treatment of the essential volar part from LTq ligament, b) dorsal approach[6] enabling direct visualization of treatment of dorsal part of SL ligament, or c) a combination of both approaches.[11,15] The available studies do not provide evidence that any of the mentioned treatments

would significantly favor one particular procedure.[11] It therefore depends on the personal preference of each surgeon who chooses approach to achieve optimal reduction, reconstruction, and stabilization of individual components of the injury to reduce the frequency and severity of permanent consequences.[2,4,7] Anyway we start usually with the dorsal approach which rarely has to be expanded with an additional palmar approach and of course if there are any signs of median nerve compression we open the carpal canal.

If the carpus however is severely destroyed and not reconstructable a primary proximal row carpectomy can be performed as salvage procedure.

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Having observed number of perilunate dislocations performed by Dr. Med Katerla over the last couple of months, I bear high esteem and would like to express my gratitude to her for a chance to participate on the treatment of such rare, but rather severe, injuries. I also thank Dr. Med Katerla for her wise counsel and tips for improvement concerning the problems of perilunate dislocations.

Figures

Fig. 1. transscaphoid perilunate dislocation with a typical “spilled teacup sign”

Fig. 2. Capito-lunatum dissotiation and a missing part in the proximal carpal row

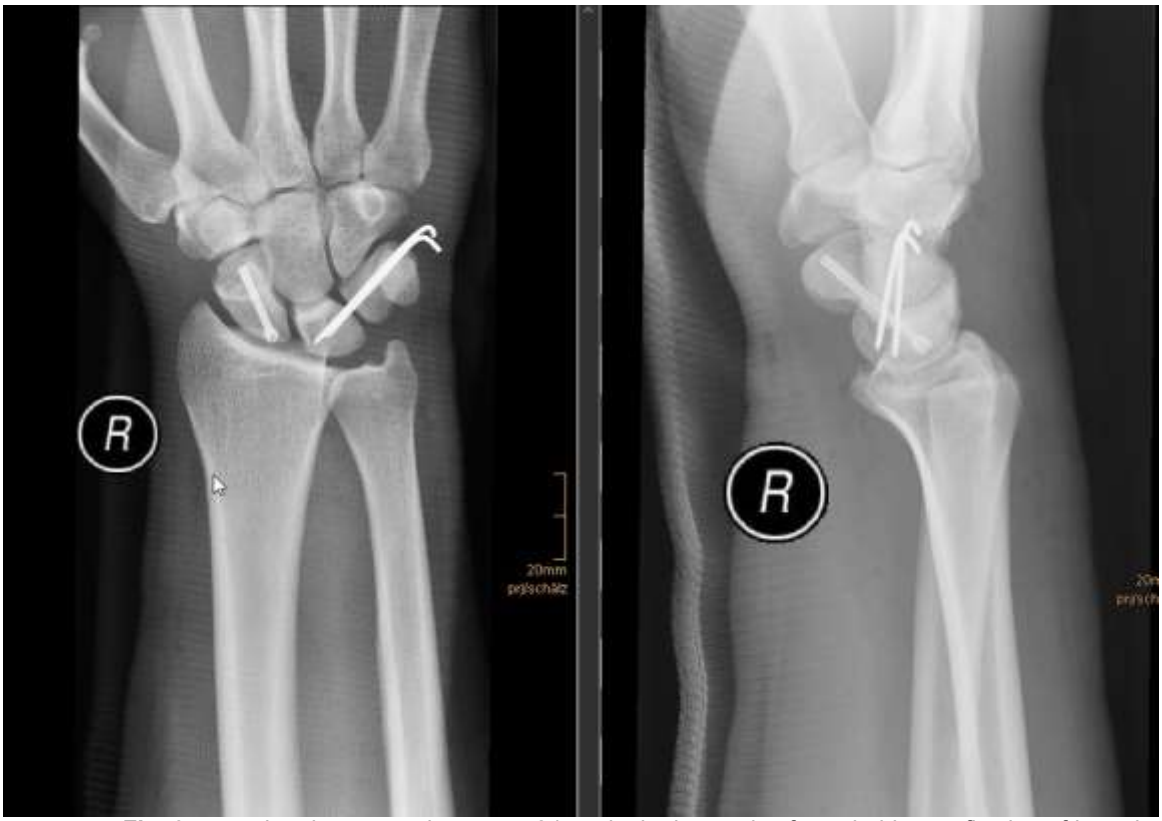

Fig. 3. cannulated compression screw 24mm in the long axis of scaphoid, transfixation of lunotriquetral joint with two 1,6 mm K-wires and restoration of normal wrist anatomy

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