



Distal Row Carpectomy—A Possible Salvage Procedure of Severe Carpal Trauma

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Summary: Complex fracture dislocations of the wrist often result in post-traumatic arthrosis. In trying to avoid total arthrodesis, alternative treatment strategies have been investigated. For this purpose, we present the case of a 56-year-old male patient who sustained a direct trauma during a circular saw accident, resulting in the destruction of the distal carpal row among other things. However, the proximal carpal row was found completely intact. We indicated an emergency distal row carpectomy. Eighteen months postoperatively, the patient showed very good range of movement with no pain, and radiologically, the proximal carpal row was still intact, with no signs of an incipient radiocarpal arthrosis. This case demonstrates the successful removal of the distal carpal row in terms of a distal row carpectomy. (*Plast Reconstr Surg Glob Open* 2015;3:e480; doi: 10.1097/GOX.0000000000000404; Published online 10 August 2015.)

Complex fracture dislocations of the wrist often result in posttraumatic arthrosis. In these cases, patients can experience severe pain and loss of function of the wrist, and as a result, many of them end up having a total arthrodesis.¹ In trying to avoid the disadvantages of total arthrodesis, alternative treatment strategies have been investigated. Acute posttraumatic proximal row carpectomy can be indicated but is rarely reported in the literature.¹ To our best knowledge, a description of a distal row carpectomy (DRC) has not yet been published. We suggest this unconventional method as a therapeutic alternative for selected individual cases of acute injury.

For this purpose, we present the case of a 56-year-old male patient who sustained a direct trauma during a circular saw accident, resulting in a

full-thickness wound with comminuted fractures of the dorsal left wrist with a severe destruction of the distal carpal row (Fig. 1). The distal carpal row (hamate, capitate, trapezoid, and trapezium) was completely destroyed and the fragments misaligned; all extensor tendons and the radial artery were transected in the tabatière. The patient was brought to the operating room, and because of the intraoperative findings, we indicated removal of the remnant particles of the distal carpal row (which may be called DRC) and sutured the other injured structures. To stabilize the wrist, an external fixateur (radius to third metacarpal) and additional K-wires (triquetrum to lunate, fifth metacarpal to triquetrum, third metacarpal to lunate, first metacarpal to scaphoid, and scaphoid to lunate) were placed for the duration of 10 weeks (Fig. 2). Because of the dorsal soft-skin-tissue defect, a negative-pressure wound therapy (NWPT) was applied intraoperatively, and because of the severe trauma, we performed a carpal tunnel release because hematoma had occurred in the carpal canal. After several staged revisions for the soft-tissue injury, including NWPT dressing changes and tendon sutures, a defect reconstruction of the approximately 8×13 cm measured soft-skin-tissue

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Fig. 1. Posterioranterior radiograph of the left wrist demonstrating the fractured distal row.



Fig. 2. Posterioranterior radiograph of the wrist after distal row carpectomy.

defect was performed with a free anterolateral thigh flap transplantation from the right thigh. Microvascular anastomoses were performed end-to-side to the radial artery and concomitant vein. In the long-term course, 18 months after the trauma, and after removal of the osteosynthesis material and a flap thinning, the patient was pain free and the wrist mobility measured extension/flexion 40-0-70°, radial/ulnar deviation 10-0-35°, and pronation/supination 80-0-80°. Radiologically, the proximal carpal row was still intact without signs of an incipient radiocarpal arthrosis (Fig. 3). Quick Disabilities of the Arm, Shoulder and Hand (DASH) score [with DASH score (general): 37 and DASH score (module labor and employment): 37.5] and time to return to work were also favorable (Fig. 4).

Severe wrist trauma, which is strictly related to distal carpal row, is very rare and almost not described in the literature.² Severe carpal trauma, such as perilunate fracture dislocations, represented a large spectrum of injury patterns resulting from high-energy trauma.³ Huish et al⁴ summarized the current data on the use of acute proximal row carpectomy in trauma of the proximal carpal row and concluded that

in carefully selected cases of severe carpal trauma, acute salvage procedures may be a viable alternative to open reduction and internal fixation.

The specificity of an isolated trauma of the distal carpal row is described in this article. The fact that the injury was caused by a circular saw also lacks the components of high-energy traumas, which often go hand in hand with violations of perilunate and periscaphoite ligament apparatus.⁵ However, the proximal carpal row was found to be completely intact in the case described. An open reduction and internal fixation of the distal carpal row was not possible because of the defect injuries of the hamate and capitate and because of the dislocation of the capitate and the multiple fractures of the remaining trapezium and trapezoid. Therefore, we decided to perform a DRC intraoperatively. Eighteen months postoperatively, the patient had a very good range of movement with no pain and experienced no restrictions on his personal and professional daily life. In addition, the proximal row and the bases of the metacarpal bones remained intact with no signs of dislocations, indicating a strong ligamentary connection between the remaining bones.



Fig. 3. Radiograph 18 months after distal row carpectomy.

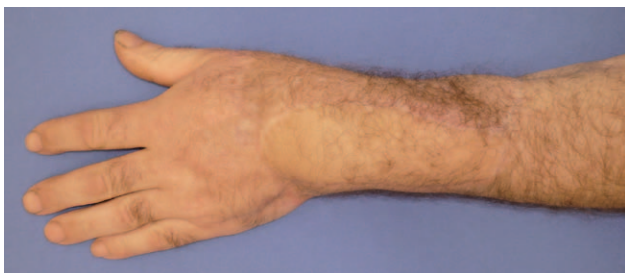


Fig. 4. View of the wrist 18 months after operation.

We believe this is the first case of DRC that is described in the literature. This case demonstrates the successful removal of the distal carpal row in terms of a DRC. In the long term, the patient's wrist mobility was very good, and he experienced no pain; thus, this operation is considered as a possible alternative for severe wrist injuries. In the future, tissue engineering methods may provide alternative surgical techniques to reconstruct large bone defects.⁶⁻⁸

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