

Roentgenologic Broken Edge “Stairway Sign” to Describe a Step-Ladder Deformity of the Finger due to Dislocation of the Interphalangeal Joints Same Finger. Case Report and Literature Review

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Abstract

Isolated interphalangeal joint dislocation is common in traumatology practice. However, simultaneous dislocation of the interphalangeal joints of a same finger is a rare injury. In the literature, only case reports are available. Authors present case report of a young patient with dislocations of the interphalangeal joints little finger of the dominant right hand. The diagnosis was made by specific clinical step-ladder deformity of the finger and roentgenographic “Stairway like sign” appearance of the joints dislocation. As in most cases, reduction was achieved by longitudinal traction. Finger splint fixation in slight flexion of the proximal interphalangeal joint was applied for nearly three weeks. Early exercise and rehabilitation program started by hand therapist to prevent joint contracture.

Keywords: Finger Interphalangeal joint dislocation; Step-ladder deformity; “Stairway sign”.

CASE REPORT

Authors describe 41 years old man that injured his little finger of the dominant right hand at the fall during personal training. A significant load was applied to the tip of the finger which caused excessive hyperextension injury. The patient observed finger deformation and went to the emergency room for medical examination and treatment. In emergency room true AP and true LAT X-ray was made, and simultaneous fracture dislocation of proximal (PIP) and distal (DIP) joints of the little finger were diagnosed. Under digital block, longitudinal traction applied for reduction. There were no difficulties for anatomical reduction of the dislocated joints. The finger was fixated by finger splint in slight flexion at PIP joint due to avulsion fracture at the basemiddle phalanx. Control X-ray was made for the assessment of the anatomical joints reduction. Early exercise and rehabilitation program

started by hand therapist between two to three weeks after reduction to prevent joint contracture.

ROENTGENOLOGIC EVALUATION OF THE INJURY

Standard true AP and true LAT X-ray was made for the evaluation of the clinical step-ladder deformity of the finger in the described case, as in all reported cases in the relevant literature (1-7). The authors notice that in all related cases the authentic roentgenologic appearance of the clinical step-ladder deformity is existing. On the true LAT X-ray deformation looks like “stairs” without any differences (Fig. 1). In most radiographs, avulsion fracture of the volar side of the base middle phalanx (Volar plate injury) and in some cases on the base of the distal phalanx was existed (Fig. 2). According to this strongly identical roentgenologic findings, authors decided call that X-ray appearance as broken edge “Stairway sign” (Fig. 3).

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Fig. 1. AP and True LAT roentgenograms of the little finger RT hand immediately after injury.



Fig 2. AP and True LAT roentgenograms of the little finger RT hand after closed reduction and finger splint fixation.

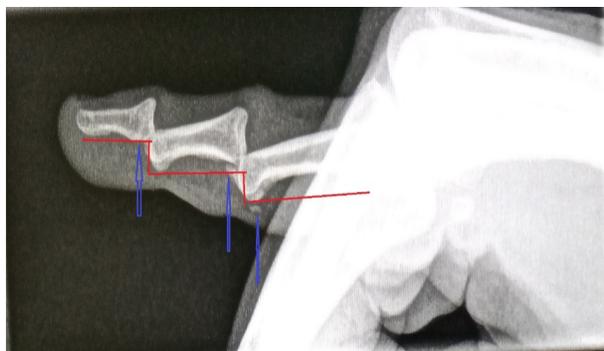


Fig. 3. Schematic presentation of the broken edge “Stairway sign.” Red lines present Stairs like deformity of the finger. Blue arrows point avulsion fractures of the phalanges that simulate broken edges of the stairs.

DISCUSSION

Since the first double dislocation was first described in 1874, only dozens of cases have been reported (1). Diagnosis made by specific clinical step-ladder deformity of the finger and roentgenographic appearance of the joints dislocation. In most cases reduction achieves by longitudinal traction (2-7). Finger splint fixation in slight flexion of proximal interphalangeal joint indicated for nearly three weeks. Early exercise and rehabilitation program done by hand therapist to prevent joints contracture strongly recommend. In most cases published in medical literature avulsion fracture of the volar side of the base middle phalanx were detected on the attached radiograms. However, this sign is not drawn much attention by the authors. Underdiagnosis of the volar plate displaced avulsion fracture especially in the PIP joint will case to incorrect decision making about appropriate treatment and contracture or instability of the joint. Authors believe that use of the described broken edge “Stairway sign” will help to traumatologist diagnose the chip avulsion fracture in the relevant true LAT X-ray of the finger and truly treat that. According to our understanding, it is possible to extend the broken edge “Stairway sign” to simple dislocation of PIP joint. Authors strongly recommend using this roentgenologic sign for appropriate diagnosis and treatment of the injury.

DISCLOSURE

No author who contributed to this article has any conflict of interests to declare. All treatments and data collection performed in accordance with the laws of the State of Israel. The roentgenologic images presented during and after the treatment are published after receiving detailed written confirmation from the patient.

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