



Double dislocation of both interphalangeal joints in the finger Case report and literature review

Hilde VAN RANSBEECK, Luc DE SMET

The authors report a case of traumatic dislocation of both interphalangeal joints of the ring finger in a 29-year-old male patient, an injury sustained while playing soccer football. Reduction was achieved by closed manipulation, followed by splinting in the “intrinsic plus” position. The joints were stable but had not yet fully recovered their mobility at six months follow-up. The authors survey the literature reports on this rare injury.

CASE REPORT

A 29-year-old male sustained a hyperextension injury to the tip of his right fourth finger while playing soccer football. He presented to the emergency room with a swollen, deformed and painful finger, and he was unable to move it. There were no neurovascular or skin lesions.

Radiographs confirmed severe dorsal dislocation of the middle phalanx on the proximal phalanx but in addition showed dorsal dislocation of the distal phalanx on the head of the middle phalanx (fig 1a,b).

Reduction was achieved easily by longitudinal traction under ring block anaesthesia. The finger was splinted in the intrinsic plus position for three weeks. Physiotherapy was then started.

Six months after trauma, there still was residual swelling of the proximal interphalangeal joint. The flexion of this joint was 85°, and there was a lack of extension of 20°. Flexion of the distal interphalangeal joint was 45°, and extension was normal.

DISCUSSION

Simultaneous dislocations of both interphalangeal joints of a finger is a rare condition. The first case was published by Bartels in 1874 (2).

Double dislocation causes pain and swelling and often results in a “step-ladder deformity” (4). Most patients are young men, and the dislocations occurred in ball throwing sports. The little finger of the dominant hand seems to be frequently involved, followed by the ring finger (7, 11, 13). A possible explanation is the lack of protection from surrounding fingers or because of weakness of the ligaments (5). The mechanism of injury is a hyperextension force on both joints, first occurring at the volar surface of the terminal phalanx first dislocating the distal interphalangeal joint and then the proximal interphalangeal joint in quick succession, so it is not a “simultaneous” dislocation (3, 10, 16).

The direct force on the fingertip tears the volar plates of both joints, with or without avulsion fractures of the distal insertions, allowing the distal

From the University Hospital Pellenberg, Leuven, Belgium.

Hilde Van Ramsbeek, Resident.

Luc De Smet, Associate Surgeon-in-Chief.

Department of Orthopaedics, University Hospital Pellenberg, Leuven, Belgium.

Correspondence : Hilde Van Ransbeeck / Luc De Smet, University Hospital Pellenberg, Department of Orthopaedic Surgery, Weligerveld 1, B-3212 Lubbeek (Pellenberg), Belgium.

E-mail : luc.desmet@uz.kuleuven.ac.be.

© 2004, Acta Orthopædica Belgica.



Fig. 1a,b. — AP and lateral view of the injured finger

bone to slide on the dorsum of the head of the proximal bone. The dislocation may be associated with rupture of the central slip of the extensor tendon.

Radiographs in two projections are necessary. A true lateral projection must be taken to visualise a possible clip fracture (1, 6).

Reduction was easily obtained in our patient by traction and manipulation under ring block anaesthesia. Closed reduction is the treatment of choice if there is no soft tissue interposition that prohibits it (9). In the distal interphalangeal joint, the volar plate avulsed from the middle phalanx can become entrapped in the joint. In the proximal interphalangeal joint the condyle of the proximal phalanx can buttonhole through the extensor aponeurosis and block the reduction (14). After

reduction, immobilisation in the “functional position” has to be avoided because it often leads to instability of the PIP joint. This occurs because of the attendant loss of joint congruity in the absence of additional soft-tissue stabilisers and can predispose to the development of a secondary volar dislocation (8, 12).

As recommended by Kuczynski and Sprague (12), we selected as the position of choice the “intrinsic plus position” with the metacarpophalangeal joint at 90° and the interphalangeal joints in 15° flexion. The finger is splinted in this position for 2 to 3 weeks, following which physiotherapy is started.

We reviewed the literature, starting with Bartels (1874) (1), and we completed the series of Tabib *et al* (1998) (15) (table I).

Table I. — Overview of reported cases

Year	Author	Age	Sex	Mechanism	Loc.	Side	Tr.
1874	Bartels M.	25	F	—	V	R	—
1892	Sayre L.A.	53	M	Fall	III	L	C
1928	Sommer	—	—	—	—	—	—
1931	Scholle W.	50	M	—	IV	L	C
1932	Schörcher F.	43	M	—	V	R	C
1940	Poplika	45	M	—	V	—	—
1943	Böhler	—	—	—	V	—	—
1957	Beranyi P.	25	M	—	V	L	C
1958	Kingreen	—	—	—	—	—	—
—	Kohler	—	—	—	V	—	—
1966	Bogdanor	67	M	—	IV	R	C
1972	Schielle	—	—	—	—	—	S
1973	Nathan	44	M	Baseball	V	R	C
1974	Stack H.J.	30	M	Soccer	V	R	C
1977	Freitag P.	26	M	Baseball	V	R	C
1977	Ikpen J.O.	33	—	Cricket	V	L	C
1977	Wiles	—	—	—	—	—	—
1978	Wesely S.	28	M	Baseball	IV	R	C
1978	Afalonis	39	M	—	IV	R	C
1979	Kirshnan S.G.	32	M	Baseball	IV	R	C
1980	Espinosa	30	M	Handball	IV	L	C
1981	Glebor	40	F	—	V	R	—
1981	Mc Rae	—	—	—	—	—	—
1982	Schernberg	—	—	—	V	R	—
1982	Castanheira A.	24	M	Volleyball	V	R	C
1982	Ron D.	38	M	Pingpong	III	R	C
1982	Ilrisarri C.	—	M	—	III	R	—
1982	Rogers	26	M	—	V	—	—
1983	Xatson F.M.	28	M	Volleyball	V	R	C
1983	Dietrich	46	M	—	V	L	C
1984	Krebs	24	M	Soccer	V	R	—
1985	Hardy I.	52	M	Fall	IV	L	S
—	—	25	M	Baseball	V	R	C
1985	Köfüncüç	36	F	—	V	L	—
—	—	42	M	—	V	L	—
1986	Sandzen C.	—	—	—	—	—	—
1987	Konsens	21	F	—	V	L	—
1987	Alonso de Ros	30	M	Handball	IV	L	C
—	—	19	M	Soccer	V	R	C
—	—	53	M	Fall	IV	R	C
—	—	17	M	Soccer	V	R	C
—	—	22	M	Hockey	V	R	C
1988	Bury	36	M	—	V	R	—
1988	Ambrosia	58	M	—	V	L	C
1988	Terndrup	69	M	—	III	R	C
1989	Graad	25	M	Soccer	V	L	—
1989	Hindley	50	M	Fall	II	R	C
1990	Bayne	35	M	Soccer	IV	R	C
1990	Hage	62	F	—	II	L	C
1990	Royoo	27	M	—	V	R	C
—	—	29	F	—	IV	R	S

C = Conservative ; S = Surgical

Table I. (Continued)

Year	Author	Age	Sex	Mechanism	Loc.	Side	Tr.
1991	Kaba A.	19	M	Volleyball	V	R	C
		19	M	Volleyball	V	R	C
		31	M	Volleyball	II	L	C
1991	Hutchison	52	F	Fall	I	R	C
		59	M	Fall	V	R	S
		61	M	Fall	III	L	C
		36	M	Kick on hand	IV	R	C
		50	M	Fall	V	R	C
		29	M	Soccer	V	R	C
		26	M	Cricketball	V	R	C
		31	M	Fall	V	L	C
		1992	Andersen	66	F	Fall	II
1992	Curran	17	M	Soccer	V	R	C
1993	Inoue G.	17	M	Baseball	V	L	C
		38	F	Volleyball	IV	L	C
		42	M	Baseball	V	R	C
1995	Mahfeld A.	41	M	Sports accident	V	R	C
1996	Soucacos	70	M	Fall	V	R	C
1997	Tabib W.	37	M	Fall	II	R	C
1998	Kligman	21	M	Basketball	V	R	C
1998	Loupasis	33	M	Tennis	V	R	C
2000	Our case	29	M	Soccer	IV	R	C

Eight women and 54 men were involved. The mean age was 36.1 years (ranging from 16 to 70 years). Most cases were the result of a sports accident. The left side was less often involved than the right side (20 versus 43 times). The finger most often injured was the little finger (42 times) followed by the ring finger (14 times), the middle finger (5 times) and the index (5 times). The thumb was reported once by Hutchinson *et al* (9).

REFERENCES

1. **Alonso De Ros JF, Proubasta IR, Dolz Jordi C, Mir Bullo X.** Luxation simultanée des articulations interphalangiennes proximale et distale des doigts de la main. *Ann Chir Main* 1987 ; 6 : 43-47.
2. **Bartels M.** Traumatische Luxationen. *Arch Klin Chir* 1874 ; 16 : 636-654.
3. **Bayne O, Chabot JM, Carr JP, Evans EF.** Simultaneous dorsal dislocation of interphalangeal joints in a finger. *Clin Orthop* 1990 ; 257 : 104-106.
4. **Blomgren Andersen M, Johannsen H.** Double dislocation of the interphalangeal joints in the finger. *Scand J Plast Reconstr Hand Surg* 1993 ; 27 : 233-236.
5. **Curran AJ, McKiernan MV, McCann J.** Double interphalangeal joint dislocation in a little finger. *Injury* 1992 ; 23 : 138.
6. **Eaton RG.** The dangerous chip fracture in athletes. *AAOS Instr Course Lect* 1985 ; 43 : 314-322.
7. **Freitag P, Hurasuna SM, Milgram JW.** Double dislocation of the finger. A rare occurrence. *Phys Sports Med* 1977 ; 5 : 83-84.
8. **Hindley CS.** Triple dislocations in the index finger. *J Trauma* 1989 ; 29 : 122-124.
9. **Hutchison JD, Hooper G, Robb JE.** Double dislocations of digits. *J Hand Surg* 1991 ; 16-B : 114-115.
10. **Ikpene JO.** Dislocation of both interphalangeal joints of one finger. *Injury* 1997 ; 9 : 68-70.
11. **Inoue G, Kono Y, Kondo K.** Simultaneous dorsal dislocation of both interphalangeal joints in a finger. *J Sports Med* 1993 ; 31 : 323-325.
12. **Kuczynski K.** The proximal interphalangeal joint. *J Bone Joint Surg* 1968 ; 50-B : 656-663.
13. **Nathan FF, Schlein AP.** Multiple dislocations of a single finger. *Hand* 1973 ; 5 : 52-54.
14. **Rajoo RD, Govender S, Goya IE.** Simultaneous dislocation of the interphalangeal joints. *S Afr Med J* 1990 ; 77 : 45-46.
15. **Tabib W, Sayegh S, Frick M, Ninkabou Y, Meyer M.** Luxation étagée traumatique de l'index. A propos d'un cas et revue de la littérature. *Rev Chir Orthop* 1998 ; 84 : 75-78.
16. **Weseley MS, Barenfeld PA, Einstein AL.** Simultaneous dorsal dislocation of both interphalangeal joints in a finger. *J Bone Joint Surg* 1978 ; 60-A : 1142-1143.