Chronic Dislocation of the 5 th Metatarsophalangeal Joint with Physeal Injury of Metatarsal: A Case Report

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Abstract

Metatarsophalangeal joint dislocations are uncommon injuries. This article describes the surgical management of such injury with six months follow up report. A 13 years old boy presented with the complaints of deformity and shortening of the 5th toe of the right foot with callosity on plantar aspect since last five years. He sustained this injury by hitting a stone. He was diagnosed to have a compound dislocation of a metatarsophalangeal joint with severely angulated Salter and Harris type II epiphyseal injury of 5th toe of the left foot. Joint dislocation caused deformed shortened 5th toe, and epiphyseal malunion resulted in the plantar bony projection, callosity, ulceration, difficulty in walking and wearing the footwear. This case was managed surgically that culminated in an optimum functional and structural outcome. Malunited epiphysis was excised, the metatarsal bone was aligned and fixed with proximal phalanx by Kirschner wire to establish a pseudarthrosis. This method can be useful in such cases; however, needs to be evaluated with future studies.

Index terms— metatarsophalangeal joint, chronic dislocation, epiphyseal injury, pseudarthrosis.

1 Introduction

etatarsophalangeal (MTP) joints of the foot aresmall, very stable; and rarely get dislocated 1,2 . Dislocations are usually dorsal in direction, but horizontaland plantar dislocations have also been reported 3 . Epiphyseal injuries are the fractures through the growth plates of the bones of the children. Management of such injuries (mal-united fractures and chronic dislocations) is surgical. The present case report describes the management of an ignored dislocation of 5 th metatarso-phalangeal joint with marked ventrally displaced epiphyseal (Salter-Harris type II) injury of head of 5 th metatarsal. The report emphasizes the importance of careful physical examination and assessment of the morbid anatomy of the injury by radiographs; followed by proper management.

2 II.

3 Case History a) Personal Profile and Present History of the Patient

The patient was 13 years old male, student of 6 th standard, belonging to middle socio-economic status and Hindu religion. The patient was presented in the hospital with the history of trauma right foot 5 years back having the complaints of deformity and shortening of the 5 th toe of right foot with callosity on plantar aspect for last five years. He sustained this injury by accidentally hitting a stone while he was taking a bath outdoors resulting in a wound on the dorsum of foot and injury to joint and bone.

4 b) Treatment History

He was treated in a private clinic (general practitioner) by wound closure that healed in due course of time, but skeletal injury remained ignored. All this resulted in deformity with displaced epiphysis projecting ventrally and base of dislocated proximal phalanx protruding dorsally. Toe as a whole became short, dorsiflexed and made

the footwear bearing and walking difficult. Continuous friction over the ventrally projected displaced epiphysis resulted in a painful callosity and ulceration.

5 III.

6 Clinical Examination

Clinically there was deformity and shortening of 5 th toe right foot with scar mark of wound closure dorsally [Figure **??**(a)]. On the planter side there was visible protuberance with callosity and ulceration [Figures **??**(b) & 1(c)]. On palpation, the plantar protuberance was bony hard. Dorsally the base of the proximal phalanx was palpable. There was minimal tenderness, stiffness, and loss of active and passive movements.

IV.

7 Investigations

Antero-Posterior and lateral views of X-rays of both the feet were taken and compared. All the required blood investigations along with chest X-ray were done, and were found within normal limits.

V.

8 Diagnosis

Based on the history, clinical findings and radiographic investigation, it was diagnosed as chronic

9 Management a) Planning

Main complaints of the patient were an inability to wear the shoes, difficulty in walking and visible deformity. Conservative reduction was not possible due to fibrosis and malunion of epiphyseal injury owing to a long duration of the injury. So correction by open reduction and internal fixation was planned.

10 b) Anesthesia and Tourniquet

Procedure was done under the spinal anesthesia. Tourniquet at mid-thigh level was used, and all the precautions were followed.

11 c) Incision and approach

Injury was approached by dorsal and ventral (plantar) two different approaches. Ventrally 2cm straight incision directly over the prominence and on dorsal aspect a zigzag 3cm long incision was made. Angulated mal-united epiphysis was just beneath the skin and could be approached directly. Dorsally joint was approached by the Z-tenotomy of extensor tendon that was short and tense.

12 d) Procedure

Excision of callosity and displaced distal epiphysis of the head of5 th metatarsal was done. The rough raw area made smooth by bone file. Dorsally after Z-tenotomy of extensor tendon dislocated base of phalanx exposed and mobilized by excising the fibrous tissue. It was aligned with the metatarsal bone and fixed with 1.2mm Kirschner wire [Figure **??** (a)]. After that, lengthening of the extensor tend on was done by performing Z-tenoplasty. Both the wounds were closed [Figures **??** (a

13 e) Immobilization

Below knee Plaster of Paris (POP) slab was applied [Figure **??**]. The post-operative period was uneventful and Kirschner wire was kept in situ for three weeks. Patient was discharged after suture removal [Figures **??**(a

14 f) Follow up

On follow up after three weeks K-wire and below knee Plaster of Paris slab were removed [Figure **??**].There was no deformity except slight shortening of 5 th toe.

15 VII.

16 Result

The patient was allowed full weight-bearing at the end of one month. He was able to wear the shoes and walk freely after one month of surgery. After six months follow up, the patient was able to walk comfortably with or without shoes but slight dorsal drifting of the 5 th toe with shortening was there. No recurrence of callosity was there and painless movements at metatarsophalangeal pseudarthrosis were present.

17 VIII.

18 Discussion

Foot injuries if ignored or not properly treated can affect the ability to use the foot and lower extremity and can lead to significant long term problems of stiffness, post-traumatic arthritis, pain, instability, callosities, difficulty in footwear wearing and walking. It is necessary to evaluate these injuries properly and plan treatment accordingly. The present case was of an ignored dislocation of 5 th metatarsophalangeal joint with Salter and Harris type II epiphyseal injury of the capital epiphysis of 5 th meta-tarsal with marked angulation with planter displacement and mal-union. He was also having painful plantar callosity beneath the projecting displaced epiphysis. Open reduction is best accomplished through a dorsal approach [4][5][6][7][8][9][10] . Temporary K-wire fixation is only indicated when the reduced joint is very unstable. This case was operated by the authors, five years after sustaining the injury. Capital epiphysis and callosity were excised by direct plantar approach, whereas metacarpal and proximal phalanx were aligned and fixed by K wire for three weeks. A pseudarthrosis developed in between the metaphysis of metacarpal and proximal phalanx with useful movements. Contraction of dorsal surgical wound resulted in slight contracture carrying the toe bit dorsally. As the bony spur was removed, so callosity did not re-appeared and shortening of the toe after surgery was the result of excision of metatarsal head.

19 IX.

20 Conclusion

Traumatic dislocation of the metatarsophalangeal joint and epiphyseal injuries of small joints of foot and toes should be attended, diagnosed, and adequate treatment should be employed early to avoid complications. The case of chronic metatarsophalangeal joint dislocations with or without epiphyseal injuries should be treated surgically by appropriate surgical approaches. This unusual chronic metatarsophalangeal joint dislocation with epiphyseal injury was well managed by surgery with the good functional and structural outcome. This method can be useful in such cases, however, needs to be evaluated with future studies.

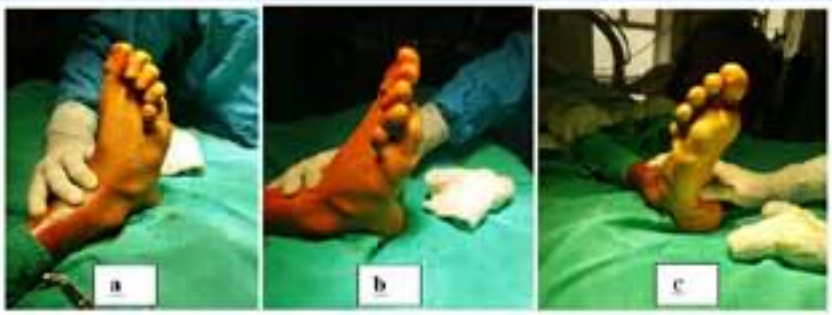

Figure 1

Figure 2: Pre-operative Radiographs

Figure:3Insertion of Kirschnerwire (Retrograde manner) and wound closure

Figure:4 Immobolization in Plaster of Paris Slab

Figure: 5Post-operative Check X-Ray with KirschnerWire in situ

Figure: 6 Post-operative wound status Day -2nd

Figure 2:

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.2 Declaration of Patient Consent:

The authors certify that they have obtained the consent of the patient and his parents for the clinical history and images to be reported in the journal while maintaining confidentiality.

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.4 Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

[Córdoba-Fernández] 'A: Management of non reducible lesser toe interphalangeal dislocation: an unusual injury'. Córdoba-Fernández . *J Am Podiatr Med Assoc2012* 102 p. .

[Sorene and Regev ()] 'Complex dislocation with double sesamoidentrapment of the interphalangeal joint of the hallux'. E D Sorene , G Regev . *J Foot Ankle* Surg2006. 45 p. .

[Woon ()] 'Dislocation of the Interphalangeal joint of the Great Toe: is percutaneous reduction of an incarcerated sesamoid an option? Surgical technique'. C Woon . *J Bone Joint Surg Am* 2011. 93 p. . (Suppl 1)

[Berger et al. ()] 'Incarcerated subhallucal-sesamoid of the great toe: irreducible dislocation of the interphalangeal joint of the great toe by an accessory sesamoid bone'. J L Berger , M T Legeyt , R Ghobadi . *Am J Orthop* 1997. 26 p. .

[Yang et al. ()] 'Interphalangeal dislocation of toes: a retrospective case series and review of the literature'. I B Yang , K K Sun , W L Sha , K S Yu , Y Chow . *J Foot Ankle Surg* 2011. 50 p. .

[Neogi et al. ()] 'Irreducible dislocation of all the lesser metatarso-phalangeal joints of the foot: A Case Report'. D S Neogi , S M Bandekar , V Sadekar , S Patnaik , T Bhat , Z D'mello . *Foot and Ankle Specialist* 2012. 5 (5) p. .

[Hey et al. ()] 'Irreducible dislocation of the fourth metatarsophalangeal joint-A Case Report'. H W Hey , G Chang , C C Hong , W S Kuan . *The American Journal of Emergency Medicine* 2013. 31 (1) p. .

[Leung and Wong ()] 'Irreducible dislocation of the hallucal-interphalangeal joint'. H B Leung , W Wong . *Hong Kong Med J* 2002. 8 p. .

[Boussouga et al. ()] 'Irreducible dorsal metatarsophalangeal joint dislocation of the fifth toe: A Case Report'. M Boussouga , J Boukhriss , A Jaafar , K H Lazrak . *The Journal of Foot & Ankle Surgery* 2010. 49 (3) p. .

[Brunet and Tubin ()] 'Traumatic Dislocations of the Lesser Toes'. J A Brunet , S Tubin . *Foot Ankle Int* 1997. 18 p. .