Pseudarthrosis and ¶delayed consolidation of the distal phalanges.

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Citation

E CAMARA, M TALL, J SANE. *Pseudarthrosis and ¶delayed consolidation of the distal phalanges.*. The Internet Journal of Hand Surgery. 2009 Volume 3 Number 1.

Abstract

The digital fractures are caused by a compression of the pulp and nail. These fractures, which are almost always open, will hinder the consolidation of the phalanx leading to a delay of consolidation beyond three months, and a pseudoarthrosis beyond six months.
Material
15 patients presented 25 cases of delayed union or pseudarthrosis of the distal phalanx in 10 years. The long finger was the most affected the dominant right side the most affected. The fracture was most often simple, proximal diaphysometaphysial. It was an accident at work in 14 cases among manual workers. The initial treatment consisted of wound care with a repositioning of the finger. It was orthopaedic in 8 cases of complex fractures, and surgical in 17 cases of simple fractures with failure of reduction. Method
The secondary surgical revision took place between 8 months and 40 months with an average of 12 months. The approach is lateral and allows freshening and control of the interfragmentary compression during the pinning on; Results
23 very good and good results, and 2 cases of amputation due to a secondary sepsis were noted. All lesions of the distal phalanxes must be treated urgently at the same time including wound care, treatment of lesions of the ungual system and site synthesis by pin. The delay of consolidation and the pseudoarthrosis should be treated surgically with lateral approach, exposure and curettage of the site, compression with spongy grafting and, in case of loss of substance, spongy grafting, blocking pinning on and splint.

INTRODUCTION

The distal digital traumatisms are lesions by direct crushing with nail and pulp problems. Considering the mechanism, they are often open fractures, with risks of devascularization of the distal fragment. The treatment is complex because of the need for a curretage (cleaning) and wound care (a careful trimming) and a treatment of the lesions of the ungual system . RICHARD (8) reports the interest of the incision and the fixiation of such lesions. Dacruz (4) insists on nail care.

The combination of such lesions explains the cases of delayed consolidation that is to say beyond 3 months, and pseudarthrosis which is observed classically beyond 6 months. Boteilhero (1) recommends the treatment of the painful pseudarthrosis.

MATERIAL AND METHOD

From January 1996 to December 2005, 25 fingers among 15 patients were treated surgically for delayed consolidation pseudarthrosis of the distal phalange (phalanx).

Figure 1

Table 1: patients:

Sex.	Male	Male	Male	Male	Male	Male	Male	Male	Male	Male	Male	Male	Male	Male	Male
Age Year	26	20	19	18	26	26	27	24	25	27	25	27	45	26	29
Fingers	1-3	2-3	Thumb	Ring finger	2-3	2-3	Ring finger-little finger	1-3	2-3	thumb	Ring finger-little finger	1-3	2	2	2-
Dominant Hand	Right side	Right side	Right side	Right side	Left side	Right side	Left side	Right side	Right side	Right side	Right side	Right side	Right side	Left side	L
Cutaneous Lesions	Open fracture	Incomplete section	Incomplete section	Open fracture	Open fracture	Open fracture	Open fracture	Open fracture	Open fracture	Open fracture	Open fracture	Open fracture	Open fracture	Close fracture	Open fracture
Fracture type	Spiroid	Transverse	Complex	Complex	0	Complex	Transverse	0	0	Complex	Transverse	0	Complex	Complex	Complex
Seat	Diaphysometaphysial	Diaphysometaphysial	Diaphysometaphysial	Right side	Diaphysometaphysial	Right side	Diaphysometaphysial	Diaphysometaphysial	Diaphysometaphysial	Left side	Diaphysometaphysial	Diaphysometaphysial	Left side	Left side	Diaphysometaphysial
Initial Treatment	Surgery	Surgery	Orthopedy	Orthopedy	Surgery	Orthopedy	Surgery	Surgery	Surgery	Surgery	Surgery	Surgery	Orthopedy	Orthopedy	Orthopedy
Surgical revision delay per month	18	12	40	6	12	6	10	12	6	11	8	8	18	9	20

Figure 2

1.Open Fracture of the distal phalange

Figure 3

2. postoperative view of the open fracture of the distal phalange

Classically the delayed consolidation is noted in 3 months and the pseudarthrosis in 6 months

It was about men, the average age was 26 years with extremes from 18 to 45 years.

The fingers concerned were:

- the thumb 4 times
- the index finger 6 times
- the middle finger 10 times
- the ring finger 2 times
- the little finger 3 times

the right dominant side in every case was involved 11 times, the left side 4 times. it was about industrial accident per crushing, compression with work tools, machines, doors, which explains the pluritissual nature of the lesions, in 11 cases, it was about open fractures and in 2 cases of a sub - total section of the finger which remained maintained by a palmar tissue bridge.

fracture: it was comminuted in 9 cases, short transverse or oblique in 16 cases. its seat was proximal diaphysometaphyseal in 19 cases, diaphyseal in 4 cases, distal (fracture of the bunch) in 6 cases. the fracture was extra articular in 20 cases and articular in 5 cases. the treatment was orthopedic in 8 cases with palmar splint, it was about open fractures in 99,75% the cases and comminuted in 28% in 17 cases, the treatment was surgical by pinning, with a persistent diastasis in 10 cases and in 7 cases, the stabilization was incorrect(inaccurate) with an angulation or a bayonet. the average time between the initial fracture and the treatment of the delayed consolidation or pseudarthrosis varied between 8 months and 10 months with an average of 12 months.

The operative indication was drawn up on the basis of clinical data, pains with under cutaneous bone bulge , exaggerated mobility obstructing manual work and the radiography which confirmed the absence of consolidation. The surgical treatment was carried out under axillary block in the event of graft on the level of the radial epiphysis or anaesthesia ring anesthesia in the absence of graft use.

The focus (seat) is approached laterally with refreshing ofthe bone. A temporary fixation is made by an axial pin 12/1Oe before making a cross pinning with pins of 10/10 E with engine and under image intensifier, to control thus their positioning by taking care well of the inter fragmentary compression, in 10 cases, an spongy graft taken on the epiphysis of the radius is put in the focus (seat).

In the event of dorsal articular fracture, the access is dorsal with folds with two side incisions in H. if the size of the fragment make it possible, the osteosynthesis is made by a pin of 8/10 th. If the fragment does not allow the synthesis, a lacing up with osseous trans fixiation is made with the resorbable wire. If the fragment is anterior, the access is done according to the incision of Brunner and the focus is fixed by a pin of 8/10th if possible, if this shouldn’t be the case ,the long flexor is laced up, then fixed by osseous trans point at the distal phalange by resorbable wire

RESULT

the consolidation was obtained between 6 weeks and 10

weeks

COMPLICATIONS

- 4 articular fractures showed a pinching of the line space
- 2 focuses presented a suppuration with necrosis having involvied a secondary amputation
- 10 ungual dystrophies were noted with thickening type or a delayed growth.
- The flexing extension of the distal digital articulation was normal in 20 cases with an amplitude of 0-45° from the inter phalangeal distal with the proximal inter phalangeal in extension and of 85°, when the proximal inter phalangeal is in complete flexion. among the 5 cases of articular fractures this active flexion varied from 10 to 30°.

Figure 4

3. ungueal aspect of the distale phalange

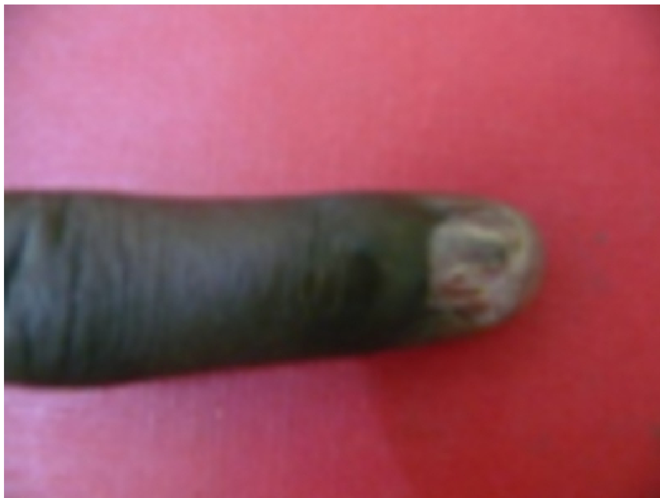
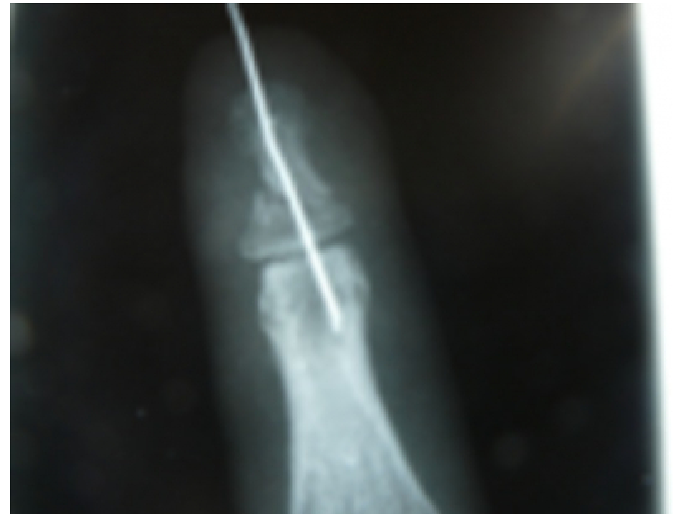


Figure 5

4- Embrochage of P3



TOTAL RESULTS

They were appreciated on:

the focus consolidation , the mobility of the articulation, the ungual dystrophy according to the patient's appreciation, after effects pains, especially on old open fractures with a sensibility of the digital collateral nerve.

These results were considered to be very good in 20 cases, goods in 3 cases and bad in 2 cases, which involve amputations

DISCUSSION

The fracture of the distal phalange generally occurs in the manual worker, among 124 cases in 10 years, 25 cases evolved towards the pseudarthrosis or with a delayed consolidation. The supporting factors are the opening of the focus to see the incomplete section of the distal phalange and the inter fragmentary variation of the focus.

An accident in the home was observed, in a man.

The fracture of the distal phalange must be treated as all fractures of other phalanges. However the frequent opening of the focus which is often soiled does not encourage the operating surgeons to fix the focus as a matter of urgency (immediately).He prefers to make an initial wound care with curretage of the wound in the same time .the lesions of the ungual system are treated, fixation of the nail by trans ungual point with or not ungual joining (suture) with fixation of the bone by pin. This initial treatment well achieved prevents the appearance of pseudarthrosis.

The treatment of the delayed consolidation or the pseudarthrosis was done in the event of instability and pain as it is recommended by Chim. H& all (2).The way is at first lateral, the mixed access careful (double side access) avoids the devascularization; For us, this way should allow only a refreshing of the focus and control the reduction. The pinning being done in percutaneous. Itoh (6) and coll use a pulpal median way which according to them preserves better the vascularization, however Poitevin and coll (7) don't recommend it because of the potential lesions of the pulpal arch or of its branches.

Foucher (5) uses an ungual reposition associated with a synthesis by axial pin, Schneider uses Kirschner Itoh and coll's pins (1) They report 6 cases treated by pinning and grafts with an excellent result. Voche and coll (9) report 15 cases of pseudarthrosis and delayed consolidation with 2 very good and good results, 2 average results and 2 amputations on account of a sepsis, in their study, they showed that there was no difference in the result between the screwing and the pinning.

The use of graft is justified in the event of loss of bone substance Itoh & coll .

Botelheiro proposes a fixation without graft, while Carozzis (3) recommends a fixation by pin associated with grafts.

CONCLUSION

Our experiment on this short series pushes us to protect the focus (seat) in the event of open fracture and to associate with it a stable osteosynthesis with an anatomical reduction ensuring a consolidation and a functional recovery . It is imperative to treat in the same time the lesions of the ungual system, which increases the stability of the fracture seat.

as far as the pseudarthroses or the delayed consolidation are concerned, the focus must be approached laterally refresh, the control of compression during its fixation is necessary, under image intensifier. The introduction of pin must be done with engine. In the event of substance loss, it is necessary to carry out an osseous graft with osteosynthesis blocking the inter distal phalange and use a splint.

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