

Ring Entrapment of the Finger in a Psychiatric Patient

V. M. Ramyil, N. K. Dakum, *L. N. Ayuba and D. Iya

Departments of Surgery and *Psychiatry, Jos University Teaching Hospital, Jos, Nigeria.
Reprint requests to: Dr. N. K. Dakum, Department of Surgery, Jos University Teaching Hospital, P.M.B. 2076, Jos, Nigeria, E-mail: dakumn@unijos.edu.ng

ABSTRACT

Ring entrapment of the finger is an uncommon occurrence in our environment and is usually amenable to conservative treatment by removal of the entrapped ring. Gangrene of the affected digit is rare. This is a report of a 57-year-old schizophrenic who developed ulceration, severe oedema and gangrene of the right middle finger following entrapment by a ring like motor spare part. Disarticulation at the metacarpophalangeal joint was necessary. The gangrene was possibly due to a combination of severe oedema, infection or a Raynaud's like phenomenon.

KEY WORDS: Ring, finger entrapment, gangrene, psychiatric illness

Introduction

Ring entrapment of the digits and its complications are not common in our environment. Entrapped rings would usually cause distal swelling,¹ and sometimes gangrene of the digits, as the severe pain would usually make the patient seek medical attention early. This may however not be the case in psychiatric patients who may not be in a mental position to seek medical attention.

Case Report

A 57-year-old man was seen at the Jos University Teaching Hospital in February 1999 with ulceration and

swelling of the right middle finger due to a ring-like motor vehicle part which the patient had inserted over that finger for an unknown reason. The patient was first diagnosed as a schizophrenic patient 15 years previously but had defaulted after 3 years of outpatient treatment, until he was found wandering with the above problem one week before presentation.

Physical examination showed no fever; he was disoriented and in a poor state of physical care, incoherent and had irrational speech. He had incongruent affect, grandiose and persecutory delusions, and perceptual disorder and had no insight. The right hand was swollen; there was a deep, infected ulcer on the proximal phalanx of the middle finger exposing the

tendons underneath an entrapped ring (a motor vehicle spare part measuring 2.5cm in diameter) (Figure 1). Distal capillary filling was good in all fingers. There was another ring (also a motor vehicle spare part) on the wrist, which was not entrapped.

Figure 1: The Entrapped Ring at the Base of the Right Middle Finger



Microbiological culture from the wound grew *Staphylococcus aureus* for which appropriate antibiotics were given. Analgesics and anti-psychotic drugs were commenced. That hand was elevated and the ulcer cleaned and dressed daily while awaiting surgery. The ring was removed under general anaesthesia, by cutting it at 2 points with an electric saw after a failed attempt with a manual saw. The finger was viable after the procedure; antibiotics, analgesics and elevation were continued. Four days later, however, the finger became gangrenous and had to be disarticulated at the metacarpo-phalangeal joint. The ring on the wrist was easily removed without a need to cut it. Subsequently the wound

healed and his psychiatric state improved, and he was discharged home after 6 weeks in hospital.

Discussion

Entrapped rings on digits lead to pressure on the tissues and interference with the venous and subsequently arterial supply, which may cause oedema, ulceration and gangrene. The severe pain associated with the oedema would usually make patients to seek medical help early. This patient did not seek help due to his psychiatric state. The aetiology of gangrene in this case could be multifactorial. Infection in the hand even from trivial trauma has been known to cause rapid swelling and gangrene.² Hand injury on its own without infection results in oedema and an increase in pressure within the enclosed spaces, and if severe leads to ischaemia and consequently gangrene.³ There is also the possibility of lymphatic obstruction. A fourth factor could be the vibrating effect of the electric saw, and the heat it releases may produce a Raynaud's like phenomenon. The consequent vasospasm further compromises the end arteries already insulted by infection and oedema. Raynaud's phenomenon is commonly bilateral and occurs in females and in patients using vibrating tools.⁴ In such cases, the aetiology may be related to a proximal mechanical cause, either occlusion of one of the major arteries, recurrent embolisation or neurovascular compression.⁴ Although Raynaud's phenomenon occurs commonly after prolonged use of vibrating instruments, it could occur following a single traumatic event such as arthrodesis of peripheral joints, crushing injuries.⁵ It is thus possible that this patient developed secondary Raynaud's phenomenon.

In mild cases of Raynaud's phenomenon, protection from cold and avoidance of pulp and nail bed infections may suffice. In more severe cases, calcium antagonists such as nifedipine may be of some benefit.⁵ Sympathectomy has been tried but is now discredited.⁵ In secondary Raynaud's phenomenon, the cause would have to be treated. Drugs may be used such as beta-blockers, ergotamine preparations and other vasospastic antagonists.⁵ Some specific drugs like iloprost and cisaprost which are prostaglandin analogues have also been tried in Raynaud's phenomenon secondary to systemic sclerosis (scleroderma). Iloprost has been found to be more effective than cisaprost.^{6, 7} Ketanserin may have some efficacy but is not significantly different from placebo, has a many of side effects and is therefore of no clinical benefit.⁷ Prazosin, an alpha-blocker has been found to be moderately effective.^{7, 8}

Entrapped fingers by rings may be treated by conservative methods, without recourse to cutting the ring or amputation of the digit. The string method is the most successful of them, where the string is wound distally and unwound proximally.¹ Other methods of removing such rings include the application of soap or fat on the finger to ease removal. An arterial tourniquet can be used to stop inflow of blood to the digit after which the digit is exsanguinated by manual pressure and the ring removed. The severe oedema and the ulceration in this patient precluded the use of any of these conservative measures. In gangrenous infection of the hand, amputation may be life saving measure.¹⁰

The loss of a digit could be incapacitating. It is recommended that; 1) Entrapped rings should be removed as early as possible by conservative means before severe oedema or other complications set in; 2) Manual sawing

with a ring cutter may be tried initially. Patience is necessary in order to avoid Raynaud's like phenomenon. This method should be a last resort; 3) after severe oedema has set in, conservative methods of management by splinting, elevation and treatment of infection should be done before surgical intervention; 4) the society should put necessary mechanisms in place to cater for the vagrant psychiatric patients.

References

1. Klenerman L. The hand. In: Mann CV, Russell Williams NS (eds) Bailey and Love's short practice of surgery. Chapman and Hall, 1995, pp 328-337.
2. Linscheid RL, Dobyns JH. Common and uncommon infections of the hand. *Orthop Clin North Am* 1975; 6:1063-1104.
3. Brown PW. Open injuries. In: Green DP (ed.). *Operative hand surgery*. Churchill Livingstone, Edinburgh, 1982, pp 1129-1160.
4. Imparato AM, Spencer FC. Peripheral arterial disease. In: Schwartz MD, Shires T, Spencer FC, Storer EH (eds.). *Principles of surgery*. McGraw-Hill, pp 902-984.
5. Murie J. Arterial disorders. In: Mann CV, Russell RCG, Williams NS (eds). *Bailey and Love's short practice of surgery*. Chapman and Hall, 1995, pp 149-178.
6. Blom-Bulow B, Oberg K, Wollheim FA et al. Cyclofenil versus placebo in progressive systemic sclerosis. A one-year double blind crossover study of 27 patients. *Acta Medica Scand* 1981; 210:419-428.
7. Pope J, Fenlon D, Thompson A et al. *Progressive systemic sclerosis (Cochrane Review)*. The Cochrane Library, Oxford, 1999, Issue 4.
8. Russel IJ, Lessard JA. Prazosin in treatment of Raynaud's

phenomenon: A double blind single crossover study. *J Rheumatol* 1985;12; 94-98.

9. Surwit RS, Gilgor RS, Allen LM, Duvic M. A double-blind study of prazosin in the treatment of Raynaud's phenomenon in

scleroderma. *Arch Dermatol* 1984; 120:329-331.

10. Neviasser RJ. Infection. In: Green DP (ed.). *Operative hand surgery*. Churchill Livingstone, Edinburgh, 1982, pp 771-791.