

The Use of Dental Drill in Removing Entrapped Finger by Metal Ring in Emergency Department

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SUMMARY

Ring removal is indicated in a number of clinical circumstances to manage or prevent tourniquet effect of the digit. A ring made from hardened metal may defy commonly known methods of removal. We reported a case of unusual difficulty in removing a ring of hardened metal composition using a dental drill. We believed the unusual circumstances of this case is likely to be repeated in some other clinical practice and this instrument is an appropriate option to consider in such cases.

KEY WORDS:

Entrapped Finger, Metal Ring, Dental Drill, Emergency Department

INTRODUCTION

A tight ring encircling the proximal phalanx may become entrapped as a result of distal swelling. Such swelling or oedema may be the result of trauma, infections, skin disorder, allergic reaction or the tight ring alone. As the digit expands, venous outflow is restricted by the tight ring, producing more swelling and may lead to nerve damage, ischaemia and digital gangrene. This condition is also known as "Ring Tourniquet Syndrome". Hence rapid removal of the ring is warrant either by cutting the ring or using ring-preservation methods. Sometimes in severe swelling with hardened ring metal may limit the use of routine ring cutter.



Fig. 1: The entrapped finger with metal ring at proximal phalanx with oedematous surrounding tissue.

CASE REPORT

A 31-year old gentleman, with history of allergy to steel, presented to the Emergency & Trauma Department (ETD) of Hospital Temerloh with progressive left little finger pain and swelling for 1 week following a failure to remove a ring stuck in that finger. He made several attempts to remove it himself but these were in vain. He then visited a nearby health clinic several times but each time, he was discharged with analgesics. In the ETD, several attempts were made to remove the ring by various methods including the use of suture, ring-cutter and bolt-cutter under local anaesthesia (wrist block) but these proved to be futile too. Furthermore, the surrounding edema made it difficult to slide the cutter beneath the ring (Figure 1). After this, the oral surgical team was called in for technical help to use the high-speed dental handpiece with diamond burr (Figure 2). The procedure which took about 20 minutes successfully cut the ring into two without any complications (Figure 3). The patient was then admitted to our observation ward for few hours to observe for any development of digital ischemia. When he did not show any sign of further complications, he was then discharged with a follow-up appointment at the outpatient clinic in 3 days' time.

DISCUSSION

A ring that is trapped on a swollen finger can be most difficult to remove¹. The constricting effects of a ring may lead to



Fig. 2: The high-speed dental handpiece with diamond burr is cutting the ring.

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obstruction of lymphatic drainage, which later leads to more swelling and further constriction, until the venous and arterial circulation is compromised as well. Persistent swelling for longer time can lead to decreased circulation which can threaten the viability of the affected fingers². Even though it is not a life threatening condition but it can lead to a severed digit if not treated as early as possible. Early referral from primary care clinics is vital in order to avoid the complication.

For several years many techniques have been described in the literature for the removal of a tight ring³. Most clinicians use the non-destructive methods such as the application of suture, glove, rubber band, nylon tape, ribbon gauze, and paper clips to remove the stuck ring. Usually the destructive method of removal will be reserved as the last resort. High speed dental handpiece drill offered an option to physician when encounter such difficult case during emergency situation. The most important part of the dental drill is a drill bit or burr. It is small and highly durable, able to endure high speed rotation and the heat that is subsequently generated. Many burr shapes are manufactured, each with varying cutting and drilling abilities. In this case the diamond burr was used to initially put two land marks on the surface of the ring, so that it could easily be detached from the finger. At the

same time irrigation was done with sterile water from a 10ml syringe which served as a coolant. This procedure were relatively time-saving and cost effective for the patient in which patient did not required admission to the ward. Only one case report of such ring removal technique using the diamond tipped dental drill with restoration of function and preservation of the finger has been reported⁴.

CONCLUSION

The technique described in this case report is a valuable and relatively safe technique and offers another option for the emergency physician to facilitate a timely removal of a tight ring. Furthermore, it is a relatively time-saving and cost effective procedure.

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ABSTRACT

Association Of Risk Factors For Hypertension In A Rural Population Of Northern Perak

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ABSTRACT

Hypertension is a major public health problem in Malaysia. The National Health and Morbidity Survey 2006 showed the prevalence of hypertension among adults 30 years and above was 43%. Therefore we attempted to examine the association of known modifiable and non-modifiable risk factors of hypertension. A survey was initiated among the rural population of Northern Perak. A total of 2025 respondents aged 30 years and above were recruited using a multi-stage sampling among five districts in Northern Perak. Hypertension was defined as self-reported hypertension and/or average of two blood pressure readings at single occasion with SBP \geq 140mmHg or DBP \geq 90 mmHg. Body mass index (BMI) was defined using the Asian criteria and IPAQ was used to evaluate physical activity. Body weight, height and blood pressure were obtained using standard procedures. In total, 1076 (54.9%) respondents were found to be hypertensive. Significant associations ($p < 0.001$) with hypertension were noted for increasing age, low physical

activity, high BMI, no education background and positive family history of hypertension. The association between hypertension and each risk factor was investigated after adjusting for age, sex, ethnicity, education background, family history, BMI, physical activity, smoking and diet using Multiple Logistic Regression. Respondents who were obese had the odds of 3.69 (95% CI: 2.22-6.14) of having hypertension while those with positive family history had the odds of 1.96 (1.59-2.42) times for hypertension. A significant increase ($p < 0.001$) in risk for hypertension was noted for age. Those with moderate physical activities were 1.40 (1.04-1.78) times more of having hypertension than those active. Poor diet score and smoking were not significantly associated with increased risk for hypertension. In conclusion, modifiable risk factors such as BMI and physical activity are important risk factors to target in reducing the risk for hypertension.

KEY WORDS:

Hypertension, obesity, physical activity, BMI