CASE REPORTS
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Bundling method to treat extensive thumb fingertip pulp incisions – a case report

Metoda spajanja za lečenje ekstenzivnih rezova pulpe vrha palca

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Abstract

Introduction. Thumb fingertip injuries, often combined with phalanx fracture or torn ligament, are very common. The focus of treatment is on how to rebuild the function and shape of the thumb. Single thumb fingertip pulp injury is more common. However, due to the diverse type of injury, no uniform treatment guideline is described in the literature. **Case report.** A patient with extensive thumb fingertip pulp incisions, which looked like multiple parallel wounds, was admitted to our Emergency Department. We used the method of bundling to maintain the shape of the fingertip. A single suture to pass through all the incisions was performed and then the suture was tied outside the skin. After that, we bandaged them with sterile bandages. Finally, good contour and fingertip function were restored. **Conclusion.** We successfully used the bundling method to treat patient with extensive thumb fingertip pulp incisions.

Key words:
reconstructive surgical procedures; suture techniques; thumb; wounds.

Apstrakt

Uvod. Povrede vrha palca, često kombinovane sa frakturom falange ili pokidanim ligamentima, veoma su česte. Fokus u lečenju je na obnovi funkcija i oblika palca. Povreda pulpe vrha palca je još češća povreda. Međutim, zbog raznolikosti tipa povreda, u literaturi ne postoje jedinstvene smernice za lečenje takvih povreda. **Prikaz bolesnika.** Pacijent sa povredom tipa opsežne incizije pulpe vrha palca, sa izgledom multiplih paralelnih rana, lečen je na našem Odeljenju urgentne medicine. Da bi održali oblik vrha prsta, koristili smo metodu spajanja. Koristili smo jedan šav da bismo prošli kroz sve rezove, a zatim smo vezali šav izvan kože. Posle toga prst je previjan sterilnim zavojima. Na kraju, prstu je vraćena pravilna kontura i obnovljena je funkcija vrha prsta. **Zaključak.** Uspešno smo koristili metodu spajanja za lečenje pacijenta sa opsežnim rezovima pulpe vrha palca.

Ključne reči:
hirurgija, rekonstruktivna, procedure; šavovi, tehnike; palac ruke; rane i povrede.

Introduction

The fingertips have special anatomical features and highly complex functions. Therefore, once the injury occurs, it brings great inconvenience and disability to the patient [1, 2]. Unfortunately, fingertip injuries occur quite commonly. There is no clear classification of fingertip injury to guide clinicians in proper management. Usually, injuries are defined as defects or no defects. Other definitions involve structures, such as pulp, nails, and bones, which also define the location of the injury. There are many treatment methods in the literature that describe defects and multiple structural composite injuries [3]. However, simple fingertip pulp injury is rarely mentioned. The finger pulp is the main soft tissue that covers the finger, providing an important pinch function and a sensitive touch [2]. Usually, after the fingertip is injured, we simply bandage it with Vaseline® or semi-occlusive dressing after thorough debridement. Undoubtedly, it is convenient to handle simple incisions. However, for complex incisions, a simple dressing may bring deformity healing, and changing dressings could be problematic.

Injuries involving more than one parallel incision or lacerations may require horizontal mattress sutures to cross all incisions to prevent damage to the blood vessel supply of the skin island located between the incisions. As the fingers are cylindrical, if the wound is valgus, it can lead to a crack after tearing multiple thumbs with horizontal mattress sutures. We presented a patient with a severe incision on the thumb and fingertips, which involved multiple parallel wounds.

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Case report

A 52-year-old butcher presented at our Emergency Room with extensive incisions on the fingertip of his right thumb. He accidentally put his right thumb in the meat slicer while working. There were multiple parallel incisions on his right thumb fingertip pulp (Figure 1). The incision did not involve the tendons in zone 1, and the image showed no fracture. Tetanus injection was performed before surgery, and ceftazidime was used to prevent infection. The incision involved the entire fingertip, but not the nail bed, and the distance between the incisions was only about 1–2 mm, and the depth was 3–5 mm. Horizontal mattress sutures were suitable for multiple parallel incisions, although it is limited to cases where the skin is flat and the soft tissue is thick.

After obtaining the patient's consent, we performed debridement in the Emergency Room. After anesthetizing the root of the finger, we used a single suture to pass through all the incisions and then tied the suture outside the skin (Figure 2). The patient left the hospital immediately after the operation. The patient was given oral anti-inflammatory drugs and analgesics and told to come for a follow-up at the clinic. The dressing was changed regularly after the injury, and because there was more wound fluid in the first week, the dressing was changed every day, and every 2–3 days after a week. The thread was removed 14 days after surgery.

The patient's incision healed 2 weeks after surgery, and we removed the tied sutures and wrapped the affected thumb with sterile gauze. At 12 months follow-up, the incisions of the thumb fingertip healed well, and the contour of the fingertips returned to normal (Figure 3). The thumb's flexion and extension function were normal, and there was no abnormal pain in the fingertips but a little numbness.



Fig. 1 – The patient's thumb fingertip pulp was severely injured, with 5 parallel lacerations, but the nail bed was intact.

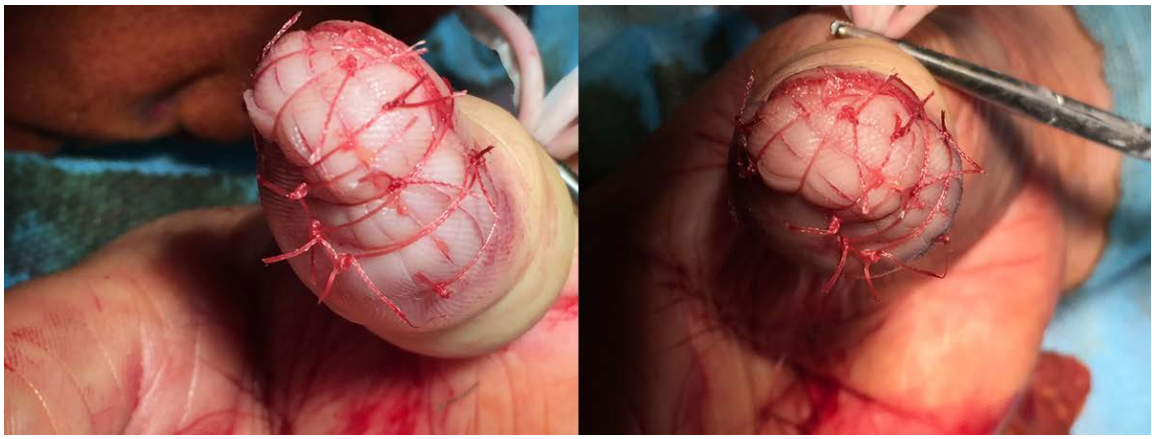


Fig. 2 –After wearing the tourniquet, all the lacerations were crossed with single sutures (left), and the sutures were bundled outside (right).



Fig. 3 – After a year of follow-up, the patient's fingertips healed well and there were no hypertrophic scars.

Discussion

Hand injuries are the most frequently encountered injuries, contributing up to 30% of accident and emergency attendances [1]. Fingertip incisions are an important part of hand injuries. The highly specialized structure at the fingertips can achieve tasks requiring precision, strength, and durability. Therefore, fingertip injuries, especially pulp injuries, can affect the entire hand [2]. There is a huge difference in the severity of fingertip injuries, ranging from small incisions involving skin to compound injuries including bones, tendons, and nail beds. Consequently, it is important to determine the mechanism and classification of the injury because it can indicate the degree of contamination, the amount of tissue loss, and the best treatment.

In adults, fingertip injuries are often related to professional activities. Employees of meat packaging are submitted to experience incision injuries of hand [4]. Such injured wounds are often neat and sharp. For deep and complex incisions, such as amputation, hand surgery, or even microsurgeon intervention may be required to obtain satisfactory results [3]. If the injury is superficial, or there is no important structural damage in the case of deep injury, simple wound irrigation, debridement, and wound suture in the emergency department are more appropriate, thus avoiding the need for surgery [5]. Quinn et al. [6] conducted a randomized controlled study to assess the difference in clinical outcomes between sutured incisions and conservatively treated incisions. They declared that hand incisions less than 2 cm long without tendons and fractures, which do not involve nail beds, can be cleaned and dressed without suturing, and similar cosmetic effects and normal activities can be obtained; oral or intravenous antibiotics are also not necessary [6, 7]. For incisions longer than 2 cm or complicated, the condition of tetanus, the pathogenic bacteria that may cause infection, needs to be evaluated before treatment, and the damage to the surrounding structure needs to be explored in order to rule out tetanus. There are four most used methods for closing wounds and they include Staples, Sutures, Steri-Strips, and Sticky Stuff [8]. Clinicians need to choose the appropriate closure method according to the patient's condition; there are many reports in this regard. However, there are no studies on managing extensive thumb fingertip pulp incisions.

The case we presented was a staff member from a butcher's shop who accidentally cut his right thumb with a meat slicer while working. His thumb pulp showed multiple parallel incisions. The standard care for treating such wounds is to vigorously wash the wound, debride, and remove foreign bodies; whether antibiotics should be used prophylactically remains controversial [9]. Considering the patient's working environment, the risk of *Staphylococcus aureus* infection is greater; we gave him an intravenous infusion of antibiotics to prevent possible infections. The distance between the patients' incisions was too close, and thus, choosing the appreciate suture method was hard. Because the skin of the thumb and fingertips is curved, we did not choose the horizontal mattress suture. In addition, we were concerned that the petrolatum gauze covering may cause poor wound healing. Therefore, we decided to use sutures to bind the affected finger and then bandage them with sterile bandages. Considering that binding may cause iatrogenic finger ischemia [10], we checked the blood supply after loosening the tourniquet. Eventually, the patient obtained a complete recovery of the thumb with a satisfying appearance. To the best of our knowledge, this is the first reported case of using a bundle to treat a complex thumb incision.

Conclusion

Fingertip injuries are the most common injuries in the emergency departments, with various types of wounds. Clinicians should choose the appropriate antibiotics to prevent infections based on the pathogenic bacteria that may exist in the patient's working environment. Most importantly, routine exploration should be performed to assess soft tissue damage and contamination. However, there is a risk of over-tightening resulting in finger ischemia which needs careful care. Moreover, paying attention to the blood supply at the fingertips after the operation is also important. In the future, a flexible mesh finger cuff may be developed to treat this type of injury.

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Conflict of interest

The authors declare no conflict of interest.

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