

Meat Grinder Injury to the Hand: Serial Cases

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ABSTRACTS

Introduction. Although meat grinder injury to the hand is not a common case, it causes a wide spectrum of injuries that result not only in tremendous physical and emotional pain but also substantial economic impact as well.

Case presentation. Three cases of hand injury caused by meat grinders are presented. Two injuries involved non dominant hand and one involved dominant hand, result in varying degrees of deformity. All patients arrived in emergency room with injured hand still firmly wedged in a meat grinder.

Conclusions. Although these injuries continue to prove very mutilating, maximum restoration of the injured hand can be accomplished by careful extrication, followed by preservation and reconstruction of all viable tissues. Perioperative antibiotics and wound irrigation with antibiotic solution are recommended. Microsurgical technique can be performed in treating these injuries.

Key words: hand injury, meat grinder injury, traumatic amputation

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Cedera Tangan akibat Penggiling Daging: Serial Kasus

ABSTRAK

Pendahuluan. Walaupun cedera tangan akibat penggiling daging merupakan kasus yang jarang, cedera ini dapat mengakibatkan gangguan fisik dan emosional yang hebat.

Presentasi kasus. Tiga kasus cedera tangan akibat penggiling daging dipaparkan dalam laporan ini. Dua cedera melibatkan tangan yang non-dominan sedangkan satu kasus melibatkan tangan dominan, menyebabkan derajat ke-lainan yang bervariasi. Semua pasien tiba di instalasi gawat darurat dengan tangan masih terjepit penggiling daging.

Simpulan. Pengembalian maksimal fungsi tangan dapat dicapai dengan ekstrikasi dengan hati-hati, diikuti dengan preservasi dan rekonstruksi semua jaringan yang hidup. Antibiotik perioperative dan irigasi luka dengan larutan antibiotik dapat dilakukan. Teknik bedah mikro dapat juga digunakan dalam menangani cedera ini.

Kata kunci: cedera tangan, penggiling daging, amputasi tangan

Introduction

Meat grinder injury to the hand is not a common case, it usually happens because of the little awareness that the patients have about the injury especially in the home industry of fish ball product and also meat balls. Meat grinder injury causes a wide spectrum of injuries that result not only in tremendous physical and emotional pain but also substantial economic impact as well.¹ Technologies that would prevent such injuries would be a socio-economic advancement.²

Case Presentation

Patient 1. A 23-year-old Indonesian female, sustained a crush injury when her left hand was caught in a meat grinder while preparing fish ball in March 2009. The machine was shut down by pulling the electrical plug. She was unable to extricate her hand from the grinder, and was directly brought to the emergency department with the grinder still attached to her left hand. (figure 1)

She was taken to the operating theatre, and under general anesthesia, the hand was extricated by turning the grinder in reverse direction with the adjustable wrench while pulling the hand gently. After removal the hand there was crush injury including fractures of mid phalanx of the index, middle and ring fingers, with simple fracture configuration. There is transection injury to the neurovascular bundle of the index and long fingers but it was still viable, lacerations of the extensor tendon at the PIP joint level without defect of the skin. We didn't take any x-ray picture after extricated of the hand because there was no x-ray in the operating room.

The index, mid and ring fingers were repaired by anastomoses of digital neurovascular and tendon. Then, all mid phalanx fractures of the middle and ring fingers were fixed using K-wire.

Post-operative result, all repaired fingers were still viable, during which time she was maintained on antibiotics and analgetics. She was discharged on the tenth postoperative day, and continuing physical therapy. All the K-wires were removed on eight weeks followed up she was able to do grasping and move the fingers. Figure 2, 3, and 4 showed the reconstructed hand on day-14, week-6, and week-10 after surgery respectively.

Patient 2. A 25-year-old Indonesian female, caught her non dominant hand in a meat grinder in December 2009. Immediately after the accident she was taken to the emergency room with her left hand still caught in the meat grinder. (figure 5) She was taken to the operating theatre and under general anesthesia, the grinder was reversed with the adjustable wrench until the hand was released. The index and middle fingers were severely injured on the level of DIP and PIP joints, but the other fingers were uninjured. The index finger had amputation on the level of DIP joint, and the middle finger had an amputation on the level of PIP joint. (Figure 6 and figure 7) The patient got antibiotics, analgetic, and was discharged three days after the injury. She was closely observed as an outpatient.

Patient 3. A 24-year-old Indonesian woman, caught her dominant hand in a electrical meat grinder in September 2008. Her colleague shut down the grinder by pulling the electrical plug. She was brought to the emer-



Figure 1. Crush injury before and after removal the meat grinder

gency department with the grinder still attached to her right hand. (figure 8) The patient was taken to the operating theatre, under general anesthesia, the hand was extricated by turning the grinder in reversed direction with an adjustable wrench, while gently pulling on the forearm. After removal of the grinder, there were multiple level crush injuries on the MCP level, the digit is damaged and unsuitable for replantation. (figure 9)

Debridement and amputation were performed on the level of metacarpo-phalangeal joints index, middle, ring fingers, little finger and the thumb still intact. We performed excision of non-viable tissue and suturing. She was treated with antibiotic, irrigation of the wound, and analgesic. The wound was healed and she was discharged on the ninth day after operation.

Discussions

Meat grinder injury causes potential disabling deformities to the hand in usually young active patients. All of our patients were less than 40-year-old, and all cases were females. A key concept to the management of these injuries is careful removal of the involved hand from the

grinder.¹ These occurrences of such injuries are particularly tragic, but these injuries can be prevented. It is important to know how to operate the grinder machine in a safe manner. All the patients had been provided with a wooden pestle, allowed them to force the contents in to grinder without endangering their hands, but usually they do not use the device. All the patients came to the emergency department with her hand still caught firmly in the grinder.

These injuries can be managed by careful removal of the involved hand from the grinder without causing further injury to the hand. Under general anesthesia at the operating theatre, a prophylactic pneumatic cuff was applied to the upper arm, but none of these patients required inflation to control bleeding. Each hand was released from the grinder by reversed turning of the grinder with adjustable wrench, while at the same time gently pulling the extremity until the injured hand was completely free. Following extrication of the injured hand from the grinder, we must restore the structure and function of the hand, required debridement with preservation of viable tissues, irrigation of the wound and the use of



Figure 2. Reconstructed hand on the day 14 postoperative



Figure 3. Six weeks after reconstruction



Figure 4: Ten weeks after operation, refilling satisfactory healing



Figure 5. The hand before removal from the meat grinder



Figure 6. The hand after removal from the meat grinder



Figure 7. Clinical feature and radiographs finding after reconstruction



Figure 8. The hand before removal from the meat grinder

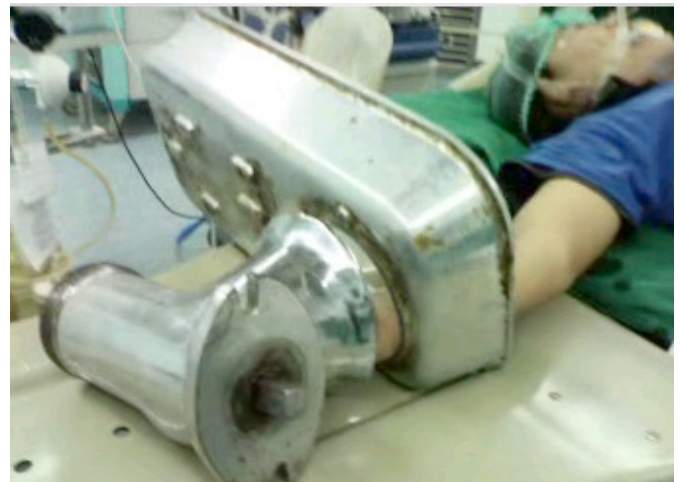


Figure 9. The hand after removal from the meat grinder

antibiotics and analgesics. Microsurgical techniques can be used to repair injured neurovascular bundles. In patients with severe mutilation with amputation of the digit needed replantation and fracture fixation.

Conclusions

Based on the experience, we suggest that the most important aspects of the management of this kind of injury is gently extrication of the hand from the grinder without causing further injury. The most important thing is that prevention is better than cure.

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