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Management of maxillofacial gunshot injury with severe tissue avulsion

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Facial defects can be treated with different regional or distance free flaps according to its nature, especially the gunshot wound.[1–3] This leads to tissue avulsion, ischemia or necrosis and thus results in secondary infection.[4] The timing for gunshot injury reconstruction is then a critical issue when in head and neck region. Here, we presented a case that we chose to use two-stage surgery with delayed secondary reconstruction. The advantage of this decision was to reduce the infection rate while promising the fair result of free flap reconstruction and the result was promising as well.

A 49-year-old male was brought to the emergency room with the chief complaint of gunshot injury on the face during a crossfire with the police. The bullet entered the left face and came out from the right face (Fig. 1a), causing fragmentation of the maxillary removable partial denture. Physical and radiographic examinations revealed a large tissue avulsion including the upper lip, nasal floor, and palatal area with the exposure of bilateral maxillary sinuses, multiple deep facial and tongue lacerations, fractures of the right orbital rim, nasal bone, maxilla, and mandibular alveolar bone. Many foreign bodies trapped in the soft tissue were also noted (Fig. 1b and c). Patient was first admitted to intensive care unit for stabilization and supportive treatments. The wet dressing was given to prevent serious wound infection. The first surgical intervention was carried out on the third day after gunshot for removal of foreign body, wound debridement, open reduction, and internal fixation of right orbital rim, closed reduction of nasal bone, and primary closure of lacerations (Fig. 1d). The avulsed wound was kept open with wet dressing (Fig. 1e). The second surgery was hold until the 21st day when there was no sign of infection (Fig. 1f). The avulsion defect was reconstructed with anterolateral thigh musculocutaneous free flap. The integrity of oral cavity was restored (Fig. 1g). The patient's facial appearance and oral function were largely improved after uneventful healing (Fig. 1h) and was discharged on day 43.

Typical gunshot wounds contain an extensive area of necrotic or burned tissue margin along with contamination and foreign body retention. Without doubt, early debridement of the wound is thus indicated for reducing infection rate. A delayed primary closure of the wound is advised if the remained tissues are questionable. However, the timing of definitive reconstruction of gunshot wounds is still controversial. Temporary damage to the microvascular structure of soft tissue with thrombus formation may up to 3 cm away from the wound, which can lead to the microvascular anastomosis failure.[5] However, the damage tissue can achieve self-recovery 10–14 days after gunshot. Thus, in our opinion, it is crucial to wait a longer period to ensure that the wound bed is ready for free flap reconstruction. Besides, because the wound is clean and there is no edema, more accurate assessment of the defect and fewer complications can then be achieved.

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Figure 1 Clinical photographs and radiographs of the patient: (a) The white arrow point out the entrance of the bullet. (b) multiple lacerations with soft tissue avulsion after gunshot. (c) The reconstructed computer tomography showed comminuted fracture of multiple facial bones. (d) C-arm was used to clean up all the foreign bodies during surgery. (e) After first surgery, we used nasal airway to maintain the airway patency to prevent it from collapsing. Wet dressing of the skin defect was also used. (f) 18 days later, the defect became small with new soft tissue replacement. (g) Reconstruction the defect with left anterolateral thigh free flap. (h) Postoperative 3-month follow-up.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Yuan Kai Ke[†]
Department of Oral and Maxillofacial Surgery, Taipei Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation, New Taipei City, Taiwan

Chih-Yuan Fang[†]
Department of Oral and Maxillofacial Surgery, Wan Fang Hospital, Taipei Medical University, Taipei, Taiwan
School of Dentistry, College of Oral Medicine, Taipei Medical University, Taipei, Taiwan

Yu Cheng Cheng
Department of Oral and Maxillofacial Surgery, Taipei Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation, New Taipei City, Taiwan
Department of Oral and Maxillofacial Surgery, En Chu Kong Hospital, New Taipei City, Taiwan

Po Chih Hsu*
Department of Oral and Maxillofacial Surgery, Taipei Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation, New Taipei City, Taiwan
Department of Oral and Maxillofacial Surgery, En Chu Kong Hospital, New Taipei City, Taiwan

*Corresponding author. Oral and Maxillofacial Surgery Department, Taipei Tzu Chi Hospital. No 289, Jianguo Rd., Xindian Dist., New Taipei City 23142, Taiwan.
E-mail address: pino0906@gmail.com (P.C. Hsu)

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[†] These two authors contributed equally to this work.