Surgical management of self-inflicted facial gunshot wounds

Katie Goad, Thasvir Singh

A 49-year-old male sustained a self-inflicted low-velocity gunshot wound to his mid and lower face. He had extensive hard- and soft-tissue injuries, including significant cervico-facial lacerations and comminuted fractures of his mandible and midface.

The relative rarity and complexity of this facial ballistic injury in New Zealand emphasises the importance of treatment protocols and early intervention, especially for those health practitioners working in rural or trauma centres.[1] An established treatment algorithm has been revisited for easy reference, which includes immediate lifesaving procedures as well as surgical management.[2]

Case report

Clinical presentation

Mr SW is a 49-year-old male who was transferred to Waikato Hospital Emergency Department with a self-inflicted gunshot wound to his mid and lower face after an attempted suicide. He was GCS 15 with signs of hypovolaemic shock that improved after medical management, but he had difficulty maintaining his own airway. He had a 2cm submandibular entry wound with a large midface laceration and exit wound. Mr SW had extensive loss of his left hemi-maxilla, comminuted fractures of the midface and mandible, as well as extensive soft tissue injuries to the floor of mouth, tongue and midface (Figure 1). He had a medical history

Figure 1: Intraoperative photos from initial injury.

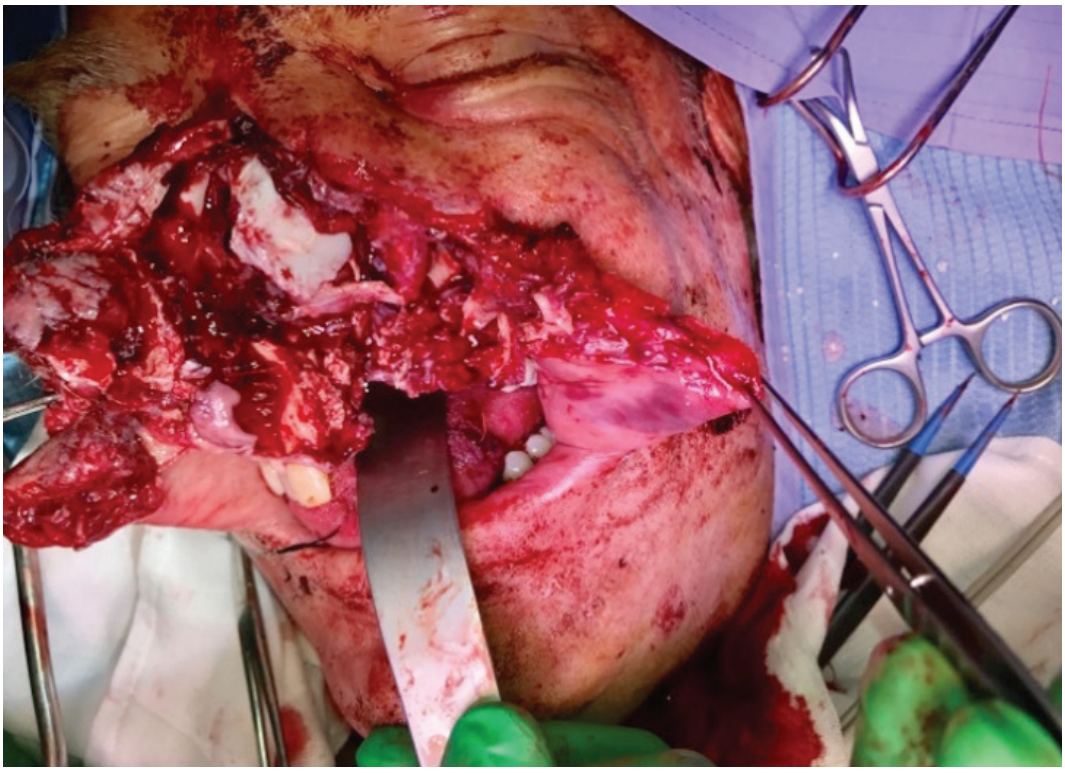

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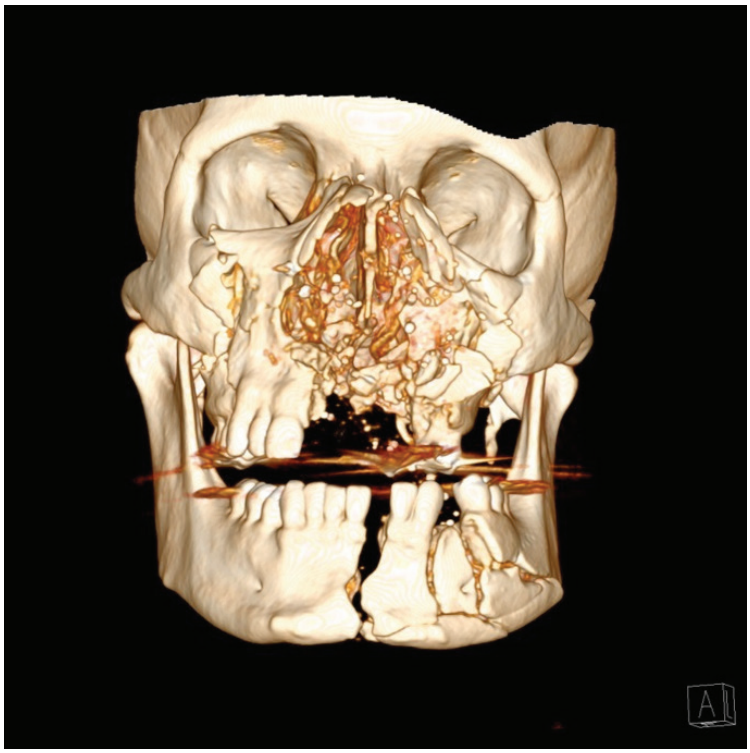
Figure 2: 3D Computed Tomography scan showing comminuted fractures of both mid and lower face with extensive shrapnel throughout.



of epilepsy, undiagnosed/non-medicated depression and excessive alcohol intake.

Management

Ongoing blood loss and developing swelling compromised his airway, so he underwent a cricothyroidotomy. His facial wound was packed and tacking sutures placed to achieve haemostasis, while receiving a concurrent a blood transfusion. CT showed comminuted fractures of the midface and mandible (Figure 2) with extensive shrapnel throughout the wound.

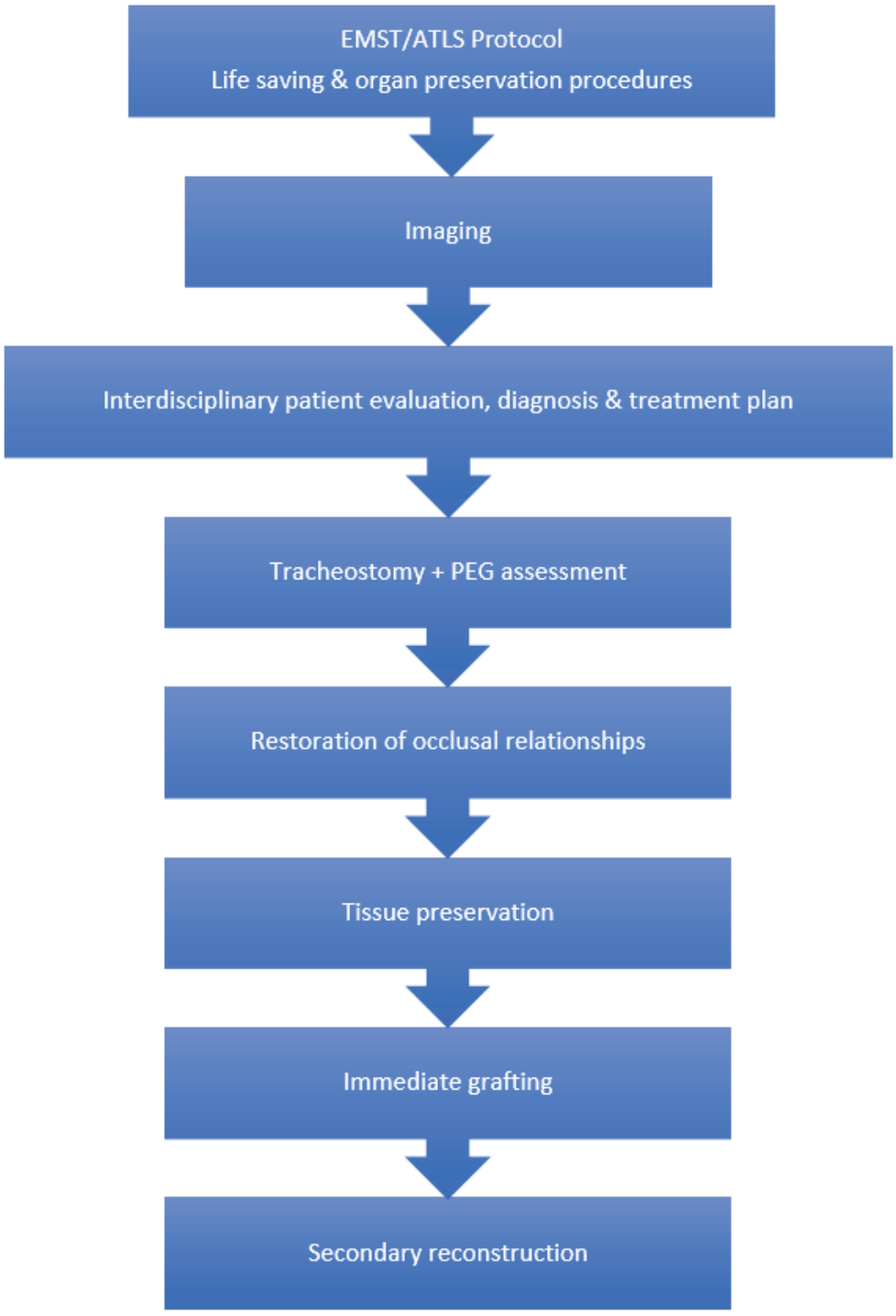
Mr SW immediately attended emergency theatre with the maxillofacial surgery service for haemorrhage control, initial debridement, fracture stabilisation and a surgical tracheostomy. Mucosal and tongue lacerations were closed and haemostasis achieved.

Four days later he underwent definitive and early open reduction and internal fixation of his mandible, with subsequent fixation of his midface fractures six days later. He underwent four further operations resulting in a six-week hospital admission. At each procedure he required ongoing debridement of developing necrotic tissue with antiseptic packing to ensure health of the surrounding tissue. Nutrition was provided via nasogastric tube initially, which was converted to a radiologically inserted gastrostomy prior to discharge. The mental health team was heavily involved and he remains under close follow up in the community where he is well supported and no longer has suicidal ideation. Mr SW currently has satisfactory facial form and function with the aid of a maxillary denture. This will be drastically improved once he undergoes the final stages of his facial reconstruction, which will aim to close his oro-nasal defect prior to a post-traumatic rhinoplasty.

Discussion

In New Zealand in 2016, there were 168 head and facial gunshot ACC claims approved.[1] These generally require extensive treatment, involving multiple specialties.[3] Countries, such as America, have such a high gunshot injury rate that they have developed specific protocols for their management. Peled[2] designed a treatment protocol for high-velocity facial injuries (which incorporates the advanced trauma life support[4]), and gives an overall protocol for patient management. This was demonstrated in our management of Mr SW (Figure 3).

Figure 3:



Definitive management of facial gunshot wounds is still controversial, treatment is moving away from a conservative approach with delayed hard tissue reconstruction, to primary fixation of the hard and soft tissues completed at the time of debridement.[5] The theory behind allowing soft tissues to heal before hard tissue reconstruction is that the chance of postoperative infection is lower, but it does risk long-term tissue contraction, complicating definitive reconstruction. Recent studies have been advocating for single stage management with successful results, which was proven in this case.[5–7] Hopefully these injuries continue to remain uncommon in New Zealand, however health professionals working in either Trauma or rural centres should be familiar with initial inter-disciplinary treatment and long-term management.

Competing interests:
Nil.

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