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Case Report

Treatment of Multiple Soft Tissue Maxillofacial Wounds: A Case Report

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Abstract:

Introduction: Trauma to the maxillofacial area is a frequent problem in medical emergencies, including injuries caused by external forces such as traffic accidents. These injuries can result in damage to the soft tissues, especially the face, which plays an important role in a person's expression, appearance, aesthetics, and identity. Prompt and appropriate treatment is essential to prevent serious complications, including infection and long-term damage.

Case Report: A 21-year-old male patient suffered facial bleeding due to a traffic accident. This incident caused lacerations to the frontal region dextra, palpebra dextra, zygoma dextra, and mental, as well as multiple abrasions to the face. Radiographic examination showed no bone fracture, but the wounds required debridement and suturing of the lacerated soft tissues. Management: The patient was diagnosed with multiple lacerations to the maxillofacial area. Initial measures included Tetagam as anti-tetanus protection, followed by Ceftriaxone as prophylactic antibiotics, Omeprazole to reduce gastric irritation, and Ketorolac for analgesic and anti- inflammatory effects. Wound cleansing and debridement were performed to reduce the risk of infection and preserve healthy tissue. The wound was then sutured with the transpositional flap technique, which allows a change in wound direction to reduce the risk of infection and ensure aesthetic and functional wound closure.

Conclusion: Multiple soft tissue wounds of the maxillofacial area due to physical trauma require prompt and appropriate management to prevent serious complications. Debridement, wound cleansing, and the use of transpositional flap technique in the treatment of laceration wounds in this case showed optimal wound healing results without complications.

Keywords: Transpositional Flap, Maxillofacial, Soft tissue trauma, soft tissue wound, debridement

Introduction:

Traffic accidents are a major health problem and are one of the leading causes of death and injury worldwide.[1] Nearly 1.2 million individuals die each year as a result of traffic accidents, with low- income and developing countries dominated by high rates of two-wheeled motor vehicle ownership and poor compliance with head protection or helmet use.[2,3] Soft and hard tissue trauma is defined as an injury caused by external forces and is one of the most frequently encountered problems in medical emergencies.[4] Among all causes of trauma, traffic accidents are one of the largest causes of soft tissue trauma among all other causes.[1] Although the mouth and surrounding area comprising only approximately 1% of the body, trauma to this area can account for between 5 to 33% of all injuries sustained by individuals of various age groups. In most cases of maxillofacial trauma, soft tissue injuries are frequently overlooked in comparison to hard tissue injuries.[5] While soft tissue injuries are rarely life-threatening, they can serve as an indicator of the severity of the trauma. Maxillofacial soft tissue injuries can affect the facial structures, which play a significant role in an individual's ability to express emotions, aesthetic appearance, and identity.[5]

Management of maxillofacial soft tissue injuries requires a prompt and accurate approach to achieve optimal aesthetic results and facial function. The treatment of facial trauma that results in multiple soft tissue injuries presents a significant challenge in promptly restoring facial function and aesthetics. Delays in management can result in the exacerbation of the wound, which may lead to complications such as infection, edema, difficulty in primary closure, and the formation of scar tissue.[5] In cases of maxillofacial trauma, it is essential to consider the potential for facial nerve injury and the risk of soft tissue complications. Nerve injury is typically the result of trauma to the petrous portion of the temporal bone and injury to the peripheral branches of the trigeminal nerve. These injuries may result from several different procedures or injuries affecting the mouth and maxillofacial area. Additional complications of soft tissue wound healing include facial atrophy, nerve damage, shortening of the upper lip length, and widening of the alar base. Infection represents the most common complication and must be monitored. Therefore, it is essential to use sterile tools and consider antibiotic administration in all surgical procedures.[6,7,8]

The objective of this case report is to present an overview and discussion of the rapid and appropriate care provided to patients with multiple soft tissue injuries in the maxillofacial area resulting from traffic accidents. We hope that this case report will provide new insights that will be useful for improving understanding and clinical practice related to the management of soft tissue trauma, especially in the maxillofacial area.

CASE REPORT

A 21-year-old male patient presented to Dr. Hasan Sadikin Central General Hospital (RSHS) with complaints of facial bleeding after a traffic accident about 1 hour earlier. The patient was crossing the road in the Pasteur area and was hit by a car from the side and fell with his face hitting the asphalt first. The patient had facial bleeding, but there was no history of fainting, nausea, or vomiting.

Figure 1. Preoperative profile photo, showing laceration and abrasion wound on the patient's right facial area

Figure 2: Photographs of the patient's lacerations on the frontal dextra, palpebral dextra, zygoma dextra, and mental areas, with their respective sizes.

Intraoral examination revealed no oral mucosal lacerations and dentoalveolar fractures, with normal occlusion and mouth opening.

Figure 3: Intraoral photograph of the patient showing no laceration of the oral mucosa and dentoalveolar fracture.

Radiographic examination revealed no evidence of cervical fracture, no fractures of the skull and facial bones, and no fractures of the costa, scapula, and clavicula.

Figure 4. X-ray photographs X-ray photographs A. Anteropoesterior B. Lateral C. Cervical D. Thorax

Based on clinical examination and radiographs, the working diagnosis was multiple maxillofacial soft tissue injuries of the frontal region dextra, palpebra dextra, zygoma dextra, and mentale. Treatment included debridement and reconstruction of facial soft tissue wounds. Treatment started with tetagam injection, ceftriaxone 1 gram IV, omeprazole injection 40 mg IV, and ketorolac injection 30 mg IV for infection control and pain relief. Further treatment consisted of wound debridement by cleaning and washing the wound with chlorhexidine and rinsing with saline. The part of the tissue that was not perfused and had the potential for necrosis was removed, while the tissue that was still well perfused was preserved and dissected for soft tissue fusion during suturing. After debridement, a transpositional flap and suturing were performed on the lacerated wound in the frontal region, right palpebra, and right zygoma, following Langer's line on the face. The suturing process used Vicryl 4/0 to suture the muscle, which is an absorbable suture, and continued with cuticular suturing using nylon 6/0 for aesthetic purposes on the facial skin.

The clinical picture after day 2 of wound care still showed swelling in the frontal dextra and periorbital dextra areas, along with other inflammatory signs such as redness. Epidermal tissue loss was still visible in the frontal and mental abrasion wounds. By day 6 (POD 6), the swelling in the frontal and periorbital dextra areas had improved but not completely resolved.

Figure 5. Postoperative day 1 photo still showing swelling of the dextra frontal and periorbital areas.

Figure 6. Postoperative day 6 photos have shown improvement but the swelling has not disappeared completely.

By day 12 (POD 12), the abrasions in the frontal and mental areas had healed, and the inflammatory signs, including redness and swelling in the frontal and periorbital areas, had also improved. On day 15, the extraoral sutures were removed and the wound was completely healed.

Figure 7. Postoperative photo day 12 abrasion wound in the forntal and mental area has healed, swelling has also decreased.

Figure 8: Suture removal and complete wound closure.

Discussion

The first step in treating a maxillofacial trauma case is to establish the patient's medical history by taking a detailed and accurate history.[9] This history not only helps in diagnosing the patient's condition, but also in formulating an appropriate treatment plan.[9] Clinical and supporting examinations, including cervical, lateral anteroposterior, and thoracic radiographs, were then performed to confirm the patient's overall condition. The results of all examinations concluded that the patient had a mild head injury with multiple lacerated soft tissue wounds in several areas, including the dextra frontal region, dextra palpebra, dextra zygoma, and mental, as well as multiple abrasions to the face without a jaw fracture. Laceration wounds are conditions in which there is a tear in the epithelial and subepthelial tissues due to incision by a sharp object or hard impact with a blunt object, while abrasion wounds are the result of friction between an object and the surface of soft tissue.10 These are the types of wounds commonly found in traffic accident victims.[1,11]

Wound infection is the most common serious complication of both lacerations and abrasions.12,13 If oral and maxillofacial lacerations are not treated appropriately and promptly, they can result in functional or aesthetic impairment and more serious health problems. Common complications in patients with lacerations include dehiscence, tissue necrosis, infection, and uneven skin margins. These complications are usually managed with re-stitching, antibiotics for infection, and foam dressings after debridement in patients with necrotic tissue.[12] As for abrasion wounds, although these are often small wounds that do not require extensive medical intervention, the loss of the protective epidermal layer makes these wounds susceptible to bacterial infections from Clostridium tetani and Staphylococcus aureus, so these wounds need to be cleaned and dressed to protect the area from repeated injury, and extensive abrasion wounds can cause wide and persistent scars that can last a long time, especially in individuals who are prone to keloid formation.[13]

Management in this case began with an injection of Tetagam, an anti-tetanus immunoglobulin. Administration of Tetagam before surgery or after injury is intended to provide rapid protection against the risk of tetanus infection, especially in this patient who had been in a highway accident, which can be contaminated and cause open wounds. Tetanus is a serious infection caused by the bacterium Clostridium tetani, which can enter the body through a cut or open wound. These bacteria produce a toxin that can cause severe muscle contractions and can be fatal if left untreated.[14] In addition, Ceftriaxone I j 1 g IV, Omeprazole Inj 40 mg IV, and Ketorolac Inj 30 mg IV. Cefriaxone itself is a third-generation cephalosporin class antibiotic that has a broad spectrum of activity against gram-positive and gram-negative bacteria. The administration of ceftriaxone in this patient was accompanied by omeprazole to reduce gastric irritation, which is one of the side effects of ceftriaxone, and the administration of ketorolac, which is a non-steroidal anti-inflammatory drug (NSAID),

to provide analgesic and anti-inflammatory effects to help provide comfort to patients during surgical procedures.[15,16,17]

Treatment of open soft tissue wounds involves cleansing the wound with chlorhexidine and then rinsing with saline to remove remaining debris and dirt to prevent infection.[10,12,18] Wound cleansing procedures are often performed using antiseptic fluids with antimicrobial properties that kill bacteria to reduce the number of bacteria to reduce the potential for infection to optimize the tissue repair process. Among all the antiseptic fluids used in wound cleansing, chlorhexidine is an antiseptic that is often used because it can inhibit biofilm formation due to the toxic effect that chlorhexidine has on bacteria.[18] The wound is then subjected to wound debridement procedures on

all tissues that are not supplied by blood and have the potential for necrosis and preservation of healthy tissue. This is done because necrotic tissue tends to be a breeding ground for bacteria and does not contribute to the healing process. Removing this necrotic tissue significantly reduces the risk of infection and aids in the healing process, allowing for linear wound closure after suturing, resulting in an aesthetic and functional suture result.[10,19]

Once the wound has been adequately cleaned and debrided, it is ready to be closed with sutures. In the management of avulsed soft tissue, one of the available flap techniques is the transpositional flap. This technique involves the transposition of two or more flaps that converge to facilitate a change in the direction of the wound, allowing it to be concealed more effectively between relaxed skin tension lines (RSTLs) or between facial regions. This technique has been applied in various areas of the body, including the fingers, ears, chest, palate, face, eyes, and ears, as well as numerous other regions. There are several basic variations of Z-plasty, including planimetric Z-plasty, double-opposing Z-plasty, compound Z-plasty, skew Z-plasty, and running/serial Z-plasty.[20]

The reconstruction of extensive laceration wounds may employ Z-plasty techniques, including the compound Z-plasty method, which is utilized in cases necessitating more intricate repairs. This technique involves the combination of multiple Z-plasties in series, thereby facilitating more efficacious repair of extensive and complex wounds. In the compound Z-plasty technique, multiple flaps are combined to repair a single wound. Each flap is associated with a distinct portion of the wound, serving to extend or repair the affected area. This technique allows the operator to repair extensive wounds, with a particular emphasis on adjusting the direction of the wound in a manner that facilitates concealment between relaxed skin tension lines (RSTLs) or between facial regions. Consequently, the compound Z-plasty method provides a more adaptable and efficacious approach to the management of extensive and complex wounds.[20]

Conclusion

This case study demonstrates a favorable treatment outcome, with an optimal aesthetic result and the absence of infection. It is anticipated that the prompt and appropriate management of multiple soft tissue injuries affecting the maxillofacial region will result in a reduction of the high morbidity rate and facilitate the restoration of the patient's functional and aesthetic appearance. A comprehensive initial assessment is fundamental to planning emergency care for patients with maxillofacial trauma.

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