Int. J. Oral Maxillofac. Surg. 2017; xxx: xxx–xxx
http://dx.doi.org/10.1016/j.ijom.2017.07.018, available online at http://www.sciencedirect.com

International Journal of Oral & Maxillofacial Surgery

Case Report
Trauma

An aggressive and fatal craniofacial group A Streptococcus infection resulting from a minimally displaced orbital floor fracture

R. M. Uhrich[1], M. Sherban[2], C. Valdez[3]

[1]Chief Resident, Department of Oral & Maxillofacial Surgery, Walter Reed National Military Medical Center, Bethesda, MD, USA; [2]Staff Surgeon, Department of Oral & Maxillofacial Surgery, USS Dwight D. Eisenhower, Norfolk, VA, USA; [3]Attending Surgeon, Department of Surgery, R Adams Cowley Shock Trauma Center, University of Maryland Medical Center, Baltimore, MD, USA

R.M. Uhrich, M. Sherban, C. Valdez: An aggressive and fatal craniofacial group A Streptococcus infection resulting from a minimally displaced orbital floor fracture. Int. J. Oral Maxillofac. Surg. 2017; xxx: xxx–xxx. Published by Elsevier Ltd on behalf of International Association of Oral and Maxillofacial Surgeons.

Abstract. While sharp, penetrating trauma is often associated with group A Streptococcus (GAS) infections and subsequent necrotizing fasciitis (NF) and streptococcal toxic shock syndrome (STSS), there are scant reports in the oral and maxillofacial surgery literature regarding blunt, non-penetrating trauma in association with these conditions. With a clinical course that initially appears relatively benign following blunt trauma, NF can progress swiftly through the fascial planes and may quickly become life-threatening if the oral and maxillofacial surgeon fails to recognize some of the critical pathognomonic signs. The case of a 64-year-old female who suffered a ground-level mechanical fall with a minimally displaced lateral orbital wall fracture is reported here. This seemingly benign, non-penetrating injury subsequently developed into rapidly progressive, fatal NF and STSS. This case is used to highlight the necessity for early detection of NF and STSS prior to rapid clinical decline, as these scenarios, particularly bilateral peri-orbital NF with resulting mortality, have been reported infrequently following blunt, craniofacial trauma in the literature related to this specialty.

Key words: necrotizing fasciitis; streptococcal toxic shock syndrome; NF; STSS; trauma; orbital floor fracture.

Accepted for publication

While sharp, penetrating trauma is often associated with group A Streptococcus (GAS) infections and subsequent necrotizing fasciitis (NF) and streptococcal toxic shock syndrome (STSS), there are scant reports in the oral and maxillofacial surgery literature regarding blunt, non-penetrating trauma in association with these conditions. Considering that approximately 50% of patients with STSS and 25% of patients with NF die from their infections, early and aggressive subcutaneous surgical debridement after prompt recognition of the presenting pathognomonic signs is critical to halting the spread of facial NF[1,2].

We report the case of a 64-year-old female who suffered a ground-level mechanical fall with a minimally displaced

0901-5027/000001+04

lateral orbital wall fracture, leading to a rapidly progressive and uniquely fatal combination of bilateral NF and subsequent STSS.

Case report

A 64-year-old white female presented to an outside hospital (OSH) with the chief complaint of right-sided facial pain, palsy, and anesthesia following a ground-level mechanical fall with impact to the right side of her face. She was diagnosed with a minimally displaced lateral orbital wall fracture and instructed to follow up with the surgeon on call. Her past medical history was significant for hypertension, hypothyroidism, diabetes mellitus, Sjögren's syndrome, and fibromyalgia, and she had a history of smoking.

Forty-eight hours after her initial presentation, she went to her primary care provider complaining of insomnia due to increasing pain and swelling, nausea, vomiting, and diarrhea, in addition to palsy and loss of sensation of the right face. Based upon her symptoms, she was sent to the emergency department of a second OSH and was evaluated for a stroke versus facial nerve palsy.

Laboratory values upon presentation were unremarkable. Initial computed tomography imaging of her brain ruled out intracranial hemorrhage, and imaging of her face showed a 4-mm minimally displaced right orbital floor fracture with intraorbital and extracoronal air and subcutaneous foci of air.

Throughout that day, she experienced progressively increasing swelling of her right face and neck, and by the afternoon she was intubated for airway protection. Repeat imaging of her face was obtained due to clinical deterioration and showed progressing soft tissue edema and periorbital emphysema without definite fluid collection.

Physical examination now demonstrated significant right-sided facial and cervical edema with crepitus present in the right peri-orbital and scalp region. The color was black to violet throughout the majority of the right neck and face. Her skin was remarkably cool to the touch and she had significant sloughing of skin on her right neck (Fig. 1).

Fig. 1. Patient immediately prior to incision, blunt dissection, tracheostomy, and culture of exudate.

She was emergently taken to the operating room for irrigation and debridement of a presumed necrotizing soft tissue infection of the face, scalp, and neck. An incision followed by blunt dissection was made to include the submental, sublingual, and parapharyngeal spaces, yielding virtually bloodless results. An intraoral incision was made in the right buccal mucosa and blunt finger dissection was used to dissect to the infraorbital rim and infratemporal fossa. This space was contiguous with the space created from the submental space. Another neck incision was made parallel to the sternocleidomastoid, and blunt dissection was carried down to the level of the carotid sheath and posteriorly to the nape of the neck and the occiput. There was no bleeding from the wound until the carotid sheath was visualized. The external jugular vein and multiple other vessels were thrombosed. Fluid cultures were obtained near the occiput, which had the appearance of dishwater discharge. A tracheostomy procedure was then completed with minimal bleeding. At this point, the decision was made to place Penrose drains in all surgical spaces, close the wounds with widely spaced, interrupted sutures, and to transfer the patient to a higher level of care, rather than continuing with an anticipated massive head and neck debridement.

Throughout the case, the patient had clinically worsened, developing acute renal failure, acute respiratory distress syndrome (ARDS), and metabolic acidosis with a base excess of 12. She was transferred to the intensive care unit (ICU) and treated for septic shock and ARDS with intravenous fluids, vasoactive agents, and ventilator support. The patient was transferred to the R Adams Cowley Shock Trauma Center for advanced ICU care and evaluation by a surgical team specializing in necrotizing soft tissue infections.

Upon arrival at the R Adams Cowley Shock Trauma Center, she had mild tachycardia, but otherwise normal vital signs on a consistent level of vasoactive agents. Physical examination demonstrated circumferential bilateral orbital necrosis extending along the inferior margin of the orbit, with inflamed and injected conjunctiva. Additionally, her right face was necrotic from the jugular notch to the lateral canthus of her left eye. The buccal mucosa was necrotic on the right, and her tongue, while dusky, was still mildly perfused. She had dark malperfusion of the skin overlying her shoulders and anterior chest, with a large area of scarlatiniform rash extending inferiorly to the mid-abdomen (Fig. 2). Her tracheostomy incision had become circumferentially necrotic and the soft tissue was liquefied. The tracheostomy tube had become mobile and insecure. To secure her airway, the tracheostomy was removed and she was orally intubated. Pertinent laboratory results obtained at this time demonstrated elevated myoglobin, aspartate aminotransferase, and creatine kinase, further indicating degeneration of the larger muscles

Please cite this article in press as: Uhrich RM, et al. An aggressive and fatal craniofacial group A Streptococcus infection resulting from a minimally displaced orbital floor fracture, *Int J Oral Maxillofac Surg* (2017), http://dx.doi.org/10.1016/j.ijom.2017.07.018