Case Report: Deep Space Neck Infection Following Intra-oral Trauma To Floor Of Mouth

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Objectives
Review the literature and discuss the management of deep neck space infections caused by intraoral trauma to the floor of the mouth.

Study Design and Methods
Case report and retrospective review of the presentation and management of deep neck space infections caused by intraoral trauma to the floor of mouth. Published articles and case reports on deep neck space infections caused by intraoral trauma were found using an English key word search through PubMed using the search terms “floor of mouth” and “trauma.”

Case Presentation
The patient was a 27 year old, otherwise healthy female, who presented complaining of 5 days of left neck pain and swelling. The onset of symptoms started after an assault 5 days prior, in which the patient described trauma to the floor of mouth. Her symptoms progressively worsened, and she presented to the emergency room complaining of increasing difficulty with oral intake and neck pain.

On examination, there was no sign of neurovascular or airway compromise, but the patient was afebrile and was suffering from one fingerbreadth trismus, fullness of the floor of mouth and significant left-sided neck erythema and induration. A CT scan was obtained that demonstrated a left submandibular abscess, medial to the submandibular gland, and tracking from the floor of mouth. An odontogenic source for the deep neck space infection was suspected, but a full dental evaluation failed to reveal any non-vital teeth.

The patient was taken to the operating room for external incision and drainage. In the operating room, the patient was found to have a rent in the floor of mouth, which was not able to be visualized on physical examination. The rent was closed primarily, the neck abscess was drained, and a penrose drain was placed. Postoperatively, the patient was kept NPO for 5 days on enteral feeding with intravenous antibiotics. The cultures from the operating room grew out coagulase-negative staphylococcus. On postoperative day 5, the patient was fed a PO trial of dyed liquid, and the neck was observed for signs of leak from the drain. No leak was observed from the floor of mouth in the neck, and the patient was observed on a clear liquid diet. On postoperative day 6, the patient was advanced to a soft diet and discharged home with oral antibiotics and oral hygiene.

The patient returned for a follow-up appointment 2 weeks later. She was doing well, had no evidence of persistent or re-infection of the neck, and the floor of mouth repair was intact.

Discussion
An underlying theme in caring for trauma patients is to consider the primary survey, consisting of the "ABC's": airway, breathing, and circulation. In patients with injuries to the floor of mouth, an assessment of the airway is paramount. Once the airway is secure and adequate ventilation is established, other life-threatening complications of the circulatory system, such as hemorrhage and shock, can be addressed. With non-catastrophic injuries to the oral cavity, the initial presentation may be innocuous, and the clinician must keep a high level of suspicion based on the given history. The incidence and prevalence of deep space neck infections has decreased significantly with the advent of antibiotics and improvements in dental hygiene. However, infectious complications secondary to penetrating intra-oral wounds may be relatively common, occurring in the range of 4%-8% of cases. Chauhan and colleagues noted that no attempt had been made to stratify these injuries based on subsite within the oral cavity or oropharynx, and patients with floor of mouth injuries may be more susceptible and at higher risk of developing deep neck space infections. Our case report also seems to support their presumption. They speculated that the effects of gravity and salivary exposure may be contributing factors to the development of deep space neck infections when the floor of mouth has been violated.

We admit to the shortcomings of a case report, and our survey of the literature only revealed isolated case reports and non-systematic literature reviews on intra-oral penetrating wounds. Perhaps this may underscore the need for larger systematic reviews to describe the natural course of penetrating injuries to the floor of mouth and to help develop management paradigms. We concluded that injuries resulting in violation of the floor of mouth are at high risk for deep space neck infection, highlighting the importance of clinical follow-up, use of antibiotics, and the role of surgical drainage. Clinicians should maintain a high level of suspicion for a floor of mouth injury after minimal trauma with the presentation of a deep space neck infection.

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Results
We performed an English literature search in PubMed for indexed articles using the search phrase "floor of mouth" and "trauma." The search resulted in 25 matches from 1975 to 2007, of which, three were deemed to be relevant and were analyzed further.

One article was a report of a floor of mouth injury due to a broken mercury thermometer that resulted in a granulomatous reaction which was surgically excised without evidence of systemic mercury toxicity after 2 years. The second article focused on airway considerations and management of a patient with a penetrating injury to the floor of mouth. The most relevant paper was by Chauhan and colleagues who reported their series of 4 patients, two of which suffered floor of mouth injuries, which required surgical drainage, and reviewed the literature on impalement injuries to the oral cavity.

Figure 1. Axial CT image illustrating left submandibular abscess