Dr. Samuel L. Bobek is a board-certified oral and maxillofacial surgeon at Swedish Medical Center in Seattle. He received his dental and medical degrees and completed his general surgery internship and oral and maxillofacial surgery residency at Oregon Health & Science University. After a fellowship in orthognathic and temporomandibular joint surgery in Charlotte, North Carolina, Bobek practiced broad-scope oral and maxillofacial surgery in Portland, Oregon. In 2014, he opened a new clinic at Swedish First Hill, where his hospital-based practice focuses on orthognathic surgery, TMJ surgery, surgical management of obstructive sleep apnea, management of head and neck infections, and trigeminal nerve repair.
TREATMENT OF INTRAORAL INFECTIONS

I had a mentor who told me two tidbits on how to treat infections:
• Don’t let the sun go down on pus.
• Drain via the shortest dependent route.

Even though I’m five years out of residency, I still hear this today. You could argue this is a symptom of PTSD, but I tend to think of it as good teaching. (This review focuses on management of odontogenic cellulitis and abscesses, which means that readers who are interested in what to do with tertiary syphilis or secondarily infected pyoderma gangrenosum ulcers will have to look elsewhere.)

Sticking to simple, general rules helps me focus my thoughts when faced with difficult or unusual clinical scenarios, and the same rules can likely help inform treatment of many oral infections in a general practitioner’s private practice. Hopefully readers will encounter some clinical pearls that may help in their practices … but even if not, this quick refresher might come in handy.

Don’t miss pathology

Swelling in the head and neck often brings to mind infection. The first thing to remember in treating infections is to make sure it is indeed an infection. (More on that in a bit.)

The patient in Fig. 1 (p. 72) was triaged by the emergency room as a dental infection three times in a row before seeing a practitioner who looked at the issue in a new light. Extraorally, this patient may look like a temporal and masseteric space infection—particularly with trismus, pain and progressive swelling—but the malocclusion and Panorex should tip you off that this is more than a deep-neck-space infection.

While entities such as malignant pathology, vascular tumors, odontogenic cysts/tumors and lymphatic malformations are not common, keeping them in the back of your mind will come in handy one day.

When all else fails, examine the patient

If a patient calls with a suspected infection, you would never go wrong to have the patient come in for an exam. This is easy to say, but more difficult at 4:45 p.m. on a Thursday before a long weekend.

While these situations can be inconvenient, examining the patient will allow you to understand what’s going on. I focus on six things:

1. Is the patient sick? We’ve all made the mistake of focusing on the infected tooth in front of us but not on the well-being of the patient. The first thing to do when evaluating patients with a head and neck infection is to simply look and talk to them. I find that’s the quickest way to evaluate the airway, as well.

Clinical signs such as difficulty swallowing, inability to lie supine, rapid breathing, paleness, diaphoresis, hoarseness or hypotension can spell signs of trouble. This patient
oralsurgery
feature

is sick. There is no reason to risk treating someone with pending respiratory collapse or septic shock in your office. The emergency room is a good place for this person.

2. Don’t forget the vitals! It’s easy to forget the vitals, but they’re very helpful in your management and good cues that an infection is indeed going on. An elevated temperature, hyper- or hypotension, tachycardia and tachypnea are all useful clinical clues.

A few quick points: We all know that a fever is higher than 38 degrees Celsius (100.4 degrees Fahrenheit), but I think we’re too quick to automatically treat the fever with Tylenol or ibuprofen. There is good evidence that a fever is beneficial to the healing process through stimulating the immune system and reducing bacterial replication.

That being said, if the temp is more than 104 F, treating the fever aggressively is appropriate. Infections tend to be painful, so expect hypertension and tachycardia in most people. With that in mind, people often have poor oral intake with intraoral infections, so be on the lookout for signs of dehydration—hypotension, dry lips and tachycardia.

3. Trismus. Limited mouth opening is a sensitive sign for deep-neck-space infections—specifically, submandibular, masseteric, lateral pharyngeal or temporalis space abscesses present with trismus. If a deep-neck-space infection is present, elevating the level of care is appropriate.

Just as with TMD patients, the key exam pearl is to make sure the patient isn’t faking it. My trick is to look into the throats and have the patient say “ahhhhhh”—if he can open his mouth more than 5 millimeters on each side of a vertical mouth mirror, then his limited mouth opening is caused by pain, not a deep-neck-space infection.

Also remember that a “normal” opening is relative. Someone with TMD/Osteoarthritis who can open to 28mm is different from an otherwise healthy male who can open to 28mm.

4. Neck swelling. Edema in the neck is an important clinical finding. It’s easy to confuse cheek swelling with neck swelling. It should be noted that swelling that extends onto the angle or body of the mandible is not the same as neck swelling (Figs. 2a–b and 3).

5. Eye swelling. It’s common to see periorbital swelling with canine space abscesses. Examining the eye is a good first step, even if it’s a simple question such as, “Can you see normally out of this eye?” Worrisome findings are decreased vision, inability to open the eyelids, dilated pupil, globe elevation and prominent globe (Fig. 4).

6. Numbness. This is not numbness of the skin due to swelling. I’m talking about regional numbness of the cutaneous distribution of a peripheral nerve—specifically, the inferior alveolar nerve. Worsening lip numbness gets me thinking about osteomyelitis.

Does this patient have any medical problems?

Medical comorbidities are always a consideration when treating an infectious process. Immunocompromised patients, such as those on chronic steroids or chemotherapy, or those with untreated HIV, uncontrolled diabetes, active cancer or malnutrition, are reasons to consider alteration of your treatment. Medical optimization or hospitalization can be helpful.

Don’t forget the X-ray

While the evaluation of an intraoral infection should always include radiographic evaluation, often it’s easy to forget because the source seems so obvious. (Also, if trismus is present, obtaining a PA can be hard.) We all know the utility of radiographs in ruling out other pathology and identifying the source, so if you can’t obtain a radiograph, consider referral.

The decision for more advanced imaging lies with the examination of the patients. If they have trismus, difficulty with breathing, change in vision, difficulty with swallowing or seem toxic, advanced imaging is necessary.
Fig. 2a–b: Examples of swelling above the angle of the mandible (left) and below (right). Notice how the swelling is predominantly below the angle of the mandible on the right. This is a sign of a deep-neck-space infection, and referral to your local oral and maxillofacial surgeon or emergency department should be made. If the swelling is above the angle of the mandible (cheek swelling), treatment in clinic is appropriate.

Fig. 3: Ludwig's angina is defined as bilateral submandibular and submental space abscesses. Note the erythema of the neck bilaterally. The swelling was firm and quite tender. This is an emergency, and 911 should be called to take the patient from your office to the local emergency room.

Fig. 4: Cellulitis from canine space infection. Notice periorbital swelling and neck erythema. This is a good patient to send to the hospital. Drawing a line along the edge of the erythema before the patient leaves can help the next doctor determine if the cellulitis is spreading.
Advanced imaging, such as a contrast CT scan of the neck, is not necessary to evaluate for a drainable fluid collection in an uncomplicated intraoral infection.

Just drain it

As mentioned earlier, don’t let the sun go down on pus. There’s no time like the present to drain that swelling in front of you.

If you’ve figured out that this is an infectious process and treatment in the clinic is appropriate, just do it. Don’t worry about if there’s an actual abscess cavity or if it is a phlegmon—just drain it.

The simple act of irrigating the tissues and removing the source should take care of the infection. Often a practitioner can be wary of damaging adjacent anatomy, such as the buccal artery or mental nerve. If you’re unsure where to drain, consider the sulcus or the extraction socket (Fig. 5).

Consider obtaining a culture

Medically, you cannot go wrong with culturing everything you drain, but in practice, it’s hard to justify the cost of culturing a straightforward odontogenic abscess.

Save the culture swabs in your office for immunocompromised patients or in someone with a more aggressive infection. Culture data can be useful for information on resistant bacteria and to guide antibiotic treatment.

Why are you putting in a drain?

Seriously. If you remove the source of the infection and drain the abscess, what’s the purpose of the drain? This is even more applicable if you choose to put patients on postoperative antibiotics and wound care. Drains can serve a few problems—need for patient follow-up, possibility of aspiration, phone calls when the drain falls out prematurely, etc.

Always deal with the source

There’s a tendency with infection management to allow the area to quiet down with antibiotics before treatment. Antibiotics will not cure abscesses in adults. If an infection is caused by a readily treatable cause, treatment of the source of the infection is absolutely imperative. It makes no sense to not extract or perform a first step in the situation of an odontogenic abscess. Even with cellulitis, opening the area as well as dealing with the cause is appropriate first-line treatment.

The only practical reason to not treat the source at the time of drainage is the inability to obtain adequate anesthesia. This is easily overcome with sedation if your practice allows.

If it doesn’t, regional anesthesia or a more concentrated anesthetic can help. If this doesn’t work, buffering your local with a basic solution is a consideration. Postoperatively, oral Penicillin-VK, Augmentin or clindamycin are useful.

If no obvious source, consider alternatives

Teeth and gingiva are a common source of head and neck infections, but don’t forget about other sources. Parotid glands, submandibular glands, tonsils, sinus infections and systemic infections also can be sources (Fig. 6).
Consider patient compliance with antibiotic therapy

Patients are often noncompliant with their medications. This can be from too-frequent dosing, too-long therapy, bad-tasting medication, cost, or difficulty swallowing the pill.

Twice-daily Augmentin (liquid form if the patient has trouble with large pills) or three-times-daily clindamycin are useful for these reasons. Consider a relatively short-duration (three to five days) antibiotic therapy—or even none—after your surgical treatment of an uncomplicated infection.

Be wary of the infection that doesn’t improve

When you see a patient multiple times, it’s easy to fall into the clinical assumption that you’re treating an infection and it must be from a resistant bug.

Don’t forget that this might be cancer, osteomyelitis, necrotizing fasciitis or even an invasive fungal infection. Often, these situations aren’t obvious unless you’re looking for them.

The most common one is osteomyelitis (Fig. 7). As we all know, the standard treatment is debridement and IV antibiotics. This treatment can be delayed because we’re lulled into thinking something else is going on. In a busy multi-practitioner clinical practice, these patients can have multiple rounds of antibiotics with intermittent follow-up from multiple providers, leading to missed clinical signs. If someone isn’t getting better after two rounds of antibiotics, consider additional imaging or pathology.

Also, consider always that an unusual infection (tongue infection, nonhealing extraction site, particularly resistant floor-of-the-mouth elevation) may actually be cancer. Don’t hesitate to biopsy or send to a practitioner who will.

“Load the boat”

Odontogenic infections are some of the most common clinical scenarios we come across. Be on the lookout for worrisome clinical findings and have confidence in your treatment.

That being said, if the patient is getting worse clinically or you are unsure what’s going on, don’t be the only provider who goes down with the ship. Look for dental and medical consultants for help and always consider a competent emergency department as a resource. Just call and give them the heads-up that a patient is on the way.