MOUTH, TEETH AND GUMS

Vijay Mahendran

(1) MOUTH

For purposes of discussion in this chapter we will briefly deal with the common oral problems encountered in an emergency department. The mouth or oral cavity comprises of the lips, cheeks, floor of the mouth, tongue, alveolar ridges, gingiva and the palate.

Lip Lesions

Cheilitis
Cracking, erythema and scaling at the corners of the mouth. There can be hyperkeratosis, erosions, crusting and skin thinning. Causes can be attributed to poor fitting dentures, vitamin deficiency, contact from lipsticks, sunscreens, dry lips and peppermint.
Treatment: Mild topical corticosteroid ointments (hydrocortisone 0.5%)
Anti-candidal (clotrimazole/nystatin), Anti-bacterial agents (mupirocin).

Lip Erosions
These can occur from impetigo, herpes simplex virus, erythema multiforme, fixed drug eruptions, zinc deficiency (acrodermatitis enteropathica), pemphigus.

Lip eczema usually affects the lower lip and spreads beyond the vermillion border into the adjacent skin.
Treatment: of cause, lip balms, hydrocortisone ointment, dietary advice.

White lesions
Candida, squamous cell papiloma, verruca, lichen planus, drug eruptions, snuff/smoker lesions (epithelial hyperplasia).

Red lesions
Haemangioma, Sturge Weber syndrome, TTP, Contact allergy.
Pyogenic granuloma is granulation tissue causing a dome shaped papule that is red brown or purple. Destroyed with electro-cautery, cryotherapy or excisional surgery.

Floor of the Mouth, Tongue and Palate

Oral Mucous Cyst = Mucocoele = Ranula:
This often occurs on the inner surface of the lower lip or floor of the mouth. It is a painless, translucent, dome shaped, tense, fluctuant, saliva-filled sac under the tongue mucous membrane. Usually from a plugged duct or trauma causing salivary duct rupture.
Treatment: I&D or marsupialisation or may disappear spontaneously. Refer to Oral Surgeon (non-urgent)

Oral fibroma
Traumatic fibroma, fibrous nodule or focus fibrous hyperplasia.
A painless solitary firm, smooth, round mass in the sub mucosa slowly enlarging. May be sessile or pedunculated. Usually occurring on the tongue, gingival, labial or buccal mucosa.
Treatment: Usually via excision Refer to Oral Surgeon (non-urgent)

Uvular oedema
Patient complains of a foreign body sensation or fullness in the throat, possibly associated with a muffled voice or gagging.
Ask about recent food, drugs [ACE inhibitors], insect bites and hereditary angio oedema.
On examination; uvula swollen, pale and somewhat translucent (uvula hydrops).
There may be associated rash or history of exposure to physical stimuli or recurrent seasonal incidents.
Treatment:

- Risk of hypopharyngeal oedema and respiratory difficulty with or without stridor- consider IV antibiotics. May need intubation or cricothyroidotomy.
- Consider lateral soft tissue x-ray to rule out epiglottic swelling.
- If fever sore throat and pharyngeal injection – throat swab, streptococcal and H Influenzae antibiotic cover with either penicillins or erythromycin.
- Nebulized adrenaline and IV hydrocortisone are also proven beneficial.
- Consider rapid access ENT clinic.

Glossitis
Inflammation of the tongue that may lead to loss of filiform papillae.

Etiology: Vitamin deficiency (B2, B6, B12, Iron), infections (viral. candidal, TB) Irritation (alcohol, tobacco, citrus, toothpaste), trauma (dentures), other (lichen planus, pemphigus, erythema multiforme, neoplasia, HSV).

Presentation: Variable
Most often red and smooth surface
Scaling occurs with infection, trauma and lichen planus.
Ulcerations with HSV, pemphigus and streptococcal infections.
Migratory glossitis (Geographic tongue): seen in DM and psoriasis. Annular erythematous patch with grey white rim.
Treatment: Treatment of cause, bland diet, Chlorhexidine mouth washes, topical 2% lignocaine or 0.1% triamcinalone. Orobase (pectin/gelatine) can be used.

Erythematous Oral Lesions
Erythroplasia: non-specific red patch. Pre malignant potential. Usually occurs on the floor of the mouth and the soft palate.
Appears as a solitary red patch / macule, may be elevated and painless or the patient may complain of a burning sensation. Biopsy is required.

Other causes are erythema migrans, pemphigus vulgaris, pyogenic granuloma hypersensitivity, vitamin deficiencies and vascular causes (haemangiomas and AVM).

Bullous Oral Lesions

Erythema multiforme: Blistering oral lesions with associated target lesions on skin caused by bacterial viral and fungal infections, drugs (barbiturates, sulphonamides). *Tretament:* Prednisolone orally.

Stevens- Johnson syndrome is a severe form of EM with systemic symptoms and involvement of eyes, GIT and genitalia.

Toxic Epidermal Necrolysis (TEN): 90% occur with mucous membrane (MM) lesions. Also on associated conjunctival and anogenital areas.

Treatment: stop offending agent. Start IVI, transfer to burns unit for supportive care.

Pemphigus Vulgaris: Autoimmune, middle age, affects skin and MM. Oral cavity may be first presentation. Usually superficial.

Treatment: Needs biopsy, Oral Prednisolone. Refer Dermatology. Emollient Mouth washes and antihistamine syrups are helpful.

Bullous Pemphigoid: Resembles PV. But usually more skin lesions, Fewer bullae, Tense vesicles. Usually deep.

Treatement: as above.

Stomatitis

Inflammation of the mucous membranes of the mouth.

Rule out: trauma (cheek biting), thermal injury (hot foods), chemical injury (mouthwashes, toothpaste, tobacco).

Treatment: topical analgesia (viscous 2% lignocaine, Benzydamine [Difflam] sprays, Bonjela paste). Simple analgesics, Chlorhexidine mouth washes and aspirin gargles. Nystatin pastilles 100,000 IU at 4 mls QDS x 10 days.

Mechanical Protection: Gelclair (Carmellose gelatine paste) swish or spit TDS (mixed with water), do not swallow! OR Orabase (Carmellose sodium) apply a thin layer after meals. Both form a protective barrier around irritations

DDx: Herpes stomatitis, denture related, angular stomatis, aphthous ulcers, squamous cell carcinoma and erythema multiforme Smokers palate.

White Oral Lesions

Candidiasis (thrush)/ stomatitis: Pseudomembranous lesion that mimics keratosis, has a predilection for palate and dorsum of tongue.

Four forms

- Pseudomembranous – creamy, cheesy plaques. Seen in DM
- Erthythematous – red or pink spot on the palate/tongue/buccal mucosa
- Hyperplastic – hard plaques/nodules on the inner lip/ palate /buccal mucosa
- Angular cheilitis – cracks with white plaques on the angles of mouth

Treatment: Nystatin pastilles 100000 IU ie 4 mls qds x 10 days or ketoconazole 200mg/day for 7 days or Itraconazole 100mg BD for 10days.

Oral Leukoplakia: a white patch or plaque that cannot be characterised clinically as any other diagnosis. Usually caused by chronic irritation. Consider premalignant until proven otherwise. Associated with smoking and tobacco chewing. Leads to

hyperkeratotic changes. Frequently found on edentulous areas of the alveolar ridges and in patients who do not wear their prosthesis. Later becomes leathery, whiter, asymmetrical and confluent.
Treatment: Biopsy and close follow up as risk of dyplasia, and carcinoma. Complete resection need not necessarily prevent carcinoma. Refer oral surgeon

Ulcers/Punctate Oral Lesions
Persistent Ulcer: major apthous ulcer, secondary to odontogenic infection, secondary to systemic disease, squamous cell carcinoma, traumatic ulcer, tumours, vitamin deficiency, ulcer in HIV.
Magic Mouthwash: Chlorhexidine mouthwashes – rinse with 10mls for 1 minute BD OR mouthwashes with oxidising agents: Hydrogen Peroxide mouthwashes – rinse with 15mls TDS,
Sore Mouth Medications: Dentinox Gel OR gels/liquids containing Benzocaine, Salicylic acid with or without menthol.
Bacterial Infections: Doxycycline 20mg bd for 3 months. Penicillins and Metronidazole are also effective for short courses.

Aphthous Ulcers:
Most common ulcerative lesion on all ages. Can present as Aphthous Stomatitis.

Presentation: burning prodrome. Can get secondarily infected. Anywhere in the mouth with a predilection for the lateral border of the tongue, buccal mucosa, lips and floor of the mouth. Usually a shallow 5mm ulcer with erythematous border and necrotic base. May occur in clusters. No vescicles. Extremely painful. May not be confined to the oral cavity, they may be found elsewhere in the digestive tract. Lesions outside the oral cavity are often associated with systemic disease.

Healing can take anywhere between 4 days to 6 weeks. Scarring necessitates the need for biopsy to rule out SCC. Consider B12, folate, Zinc and Iron deficiency and coeliac disease.
Treatment: Anaesthetic gels and sprays, hygiene, nutrition, fluids, avoid spicy and acidic foods. *Corlan* (Hydrocrtisone) pellets, allow to dissolve in contact with the ulcer qds.

Herpetic Infections:
Can occur as herpetic Gingivostomatitis

Primary HSV: Multiple vesicular eruptions at the vermilion border of lips, labial, buccal mucosa, tongue, palate, and gingival. Contagious, can sometimes present with fever. Initial vesicle formation followed by ulceration with a yellow-grey membrane on an erythematous base. Lasts for 4-9 days.
Treatment: Aciclovir topical cream 1% 2 hourly for 4 days (Ointment is 5%)

Secondary HSV: 24-48 hr prodrome of burning sensation. The ulcers are fixed (keratinised) to the periosteum of the gingival, hard palate and alveolar ridge. Can occur in clusters with vesicles that rupture to form punctate ulcers.
Herpes labialis: Vermilion border of lip (cold sore) – stimulated by fever, stress, sunlight, menstruation. Crust and heal.
Treatment: as above. Oral fluids, avoid sunlight, Aciclovir 200mg QDS for 5 days OR Famciclovir 750mg OD for 5 days.

Acute Necrotising ulcerative Gingivitis (ANUG):
Also called *Vincent's Angina* OR *Trench Mouth*
Mixed infection with fusospirochetal, spirochetes and anaerobes.
Occur as ulcers 2-30mm on the gingiva covered with purulent grey exudates. Patients usually have poor hygiene, smokers and sometimes immuno deficiencies. ANUG is rapidly progressive, presents as fiery-red gingivitis and severe pain. Patient has a foul breath, malaise, lymphadenopathy and fever. Later punched out lesions appear.
Systemic diseases that mimic ANUG include IMN, Leukemia, aplastic anaemia and agranulocytosis.
Treatment: Swabs, H_2O_2 washes, Clindamycin/Augmentin orally.

Lichen Planus:
Chronic disease of the skin and mucous membranes. Characterised by violaceous, pruritic papules on skin, With reticular, plaque or white/ violet threadlike lesions in a ring like pattern (wickman's striae) on the buccal mucosa. The hypertrophied form can resemble leucoplakia. May be painful.
Tx: Symptomatic, Topical steroids may be useful. Dapsone for severe forms.

Other Causes of Oral Ulcers:
Reiter's Syndrome(Tx: NSAIDS and PO steroids), Stevens-Johnsons Syndrome (requires systemic steroids), CMV, Crohn's disease, Behcet's disease, Ulcerative Colitis, DM, SCC, Contact allergies, Trauma, Mycotic and Bacterial infections, Actinomycosis, Drug reactions etc.

Xerostomia
Refers to dry mouth caused by decreased salivary gland flow in a patient with adequate hydration.
Aetiology: depression, anxiety, mouth breathing, Sjogren's Syndrome and Drugs (Anticholinergics, anticonvulsants, antihistamines)
Treatment: oral hygiene, increase oral fluids, humidified air, small frequent meals, artificial saliva, pilocarpine orally.

Lacerations of the Mouth
Due to its rich vascularity, impact injuries of the mouth can lead to dramatic haemorrhage. Blunt trauma to the face can cause secondary lacerations of the lip, frenulum, buccal mucosa, gingival and Tongue.
Tetanus toxoid as indicated. Check for associated injuries such as loose teeth, mandibular or facial fractures.

Tears of the upper lip frenulum: suturing required only if gum torn with the frenulum. Simple laceration or avulsion of the frenulum heal nicely on their own. A torn frenulum in a child MAY be an indication of NAI.

Large laceration can be sutured with absorbable vertical sutures (Vicryl). Usually a single stitch may be needed to control haemorrhage.

Small puncture type laceration: Heal well if only the outer skin is closed and the intra oral laceration is left open.

Small lacerations: if only minimal gaping, reassure and advice on aftercare. Spontaneous healing occurs. If gaping or continuous bleeding or large flap, then anaesthetise with Lignocaine and 1:200000 adrenaline, cleanse with copious saline, suture with 3-0, 4-0 or 5-0 absorbable suture like Vicryl or Dexon.

Through and Through Lacerations: Get Senior advice OR refer to Plastic Surgeons if department very busy.
These are lacerations involving all layers (mucosa, muscle, subcutaneous tissue and skin). Usually seen as a visible defect.
The inside-out OR bottom-up technique is used to eliminate dead spaces.
The oral mucosa, muscular layer and the subcutaneous layers can be closed with simple interrupted suturing technique with absorbable Vicryl or dexon with a cutting needle. Each layer to close separately.
Any trapped food or FB's should be removed and the wound irrigated with saline, anaesthetise with lignocaine and adrenaline. At least 4 square knots to be tied for each suture (motion of tongue easily dislodges them).
Skin closed with 4-0 to 6-0 prolene or nylon.

Lacerations of the Tongue
Most tongue lacerations that occur from falls or seizures DO NOT require sutures.
Simple large or linear lacerations in the central portion of the tongue also heal surprisingly well, with minimal risk of infection.
Suturing is needed only for gaping wounds.
Flap, bisecting, through and through wounds, wounds involving the muscular layers or labial margins need suturing and repair.
A localised area of the tongue can be anaesthetised with a lignocaine 2 to 4% soaked gauze for 5 to 10 minutes. Otherwise local infiltration might be required.
Absorbable suture material should be used and the stitch should include at least one half of the thickness of the tongue.

For both mouth and tongue lacerations advice on aftercare should be given like lukewarm water rinses or half strength H_2O_2 washes after meals. Prophylactic antibiotics are considered only for the large through and through lacerations.

(2) GUMS

Gingival Hyperplasia
Causes include anticonvulsants (phenytoin, valproate, phenobarbitone), calcium channel blockers, cyclosporine. It can lead to problems with speech and mastication. Epulis or gingival hypertrophy occurs in pregnancy and can bleed easily.

Treatment: Discontinue medication (only after expert advice) and change to another class.

Gingivitis
Is inflammation of the gums. Usually occurs due to build up plaque and can lead to gum recession.

Presentation: patients complain of severe or generalised pain of the gums, often with a foul taste or odour. The gingiva appears oedematous and red with a greyish nectrotic membrane between the teeth. The gums bleed on touch and there is loss of gingival tissue, especially the interdental papillae. The patient is usually afebrile and shows no signs of systemic disease.

Vincent's angina or Trench mouth has already been discussed above.

Severe Periodontal disease with radiological bone loss will be dealt with in the chapter on Teeth.

Gingivitis and periodontitis are Ddx for the causes of orofacial pain.

Treatment:
Refer to the Dentist.
Instruct the patient to use warm saline rinses along with flossing and gentle brushing using $NaHCO_3$ toothpaste.
In severe pain use viscous lignocaine
In severe cases Antibiotics like Doxycycline OR Penicillin V OR Erythromycin + Metronidazole can be used.

(3) TEETH

Applied Anatomy
There are two complete sets of teeth.
Primary (Deciduous) Dentition (the Milk Teeth) – erupt between 6months - 2 years.
Permanent Dentition replaces the milk teeth between 6 – 12 years.

Primary teeth – 20 (A,B,C D etc…)
Permanent – 32 (4 quadrants of 8 each), upper & lower, left and right.
Each quadrant has central incisor, lateral incisor, canine, 1&2 premolar, 1, 2 &3 molar.

The major component of the tooth is a bone like substance called Dentine. Inside the tooth lies the pulp (blood vessels and nerves). The crown is covered by enamel and the roots are covered by cementum.

Urgent (within 24 hrs) Dental referral: If severe pain cannot be relieved by analgesics. Trauma, especially if avulsion. Orofacial swelling that is new or enlarging. Bleeding that cannot be controlled. Fever due to a dental infection.

Periodontitis
Inflammation of the supporting tissues and membranes around the base of the teeth. Usually secondary to bacteria and plaque.

Plaque is biofilm that contains micro organisms that form on the teeth and between them and the gingival margins. If not removed forms tartar. Can lead to gingival recession and erosion to the bone with tooth loss.

Treatment: Refer to a Dentist. Doxycycline or Amoxycillin with a Compound analgesic helps control periodontitis.

Traumatic injuries to the Teeth
In traumatic injuries the tooth is laterally subluxed, intruded, extruded or completely avulsed from its socket.
An *OPG* is an xray of the jaw which is useful in such cases.

Chipped teeth and *crowns* do not require immediate attention. The patient can visit his/her dentist.
Tooth fracture with involvement of the pulp need to be referred to the maxillofacial on call team.

Tooth Avulsions: Extra articulation, traumatic loss. Complete displacement from its alveolar socket. Check for lacerations. CXR if aspiration suspected. *The tooth should not be allowed to dry. After 30 minutes of dry storage, irreversible damage to the periodontal cells occurs.*
Treatment:
Primary tooth – bleeding control, DO NOT replace tooth.
Permanent tooth – Emergency, tooth to be PLACED BACK ASAP (within 2 hours). If cannot be replaced, keep moist by storing in saline, saliva or milk until review by a dentist. Prognosis better if kept in the mouth under tongue. Best prognosis if replaced.
Technique of tooth Reimplantation: Primary goal is to replace tooth if alveolar socket fracture is not present. Consider tetanus booster and parental Abx is bacteraemia. OPG for fractures. Consider parental analgesia Or topical lignocaine.

Flush the tooth socket to remove clots. Do not vigorously clean the tooth as it may remove vital tissue. Rinse the apex and root of the tooth with saline, avoiding handling the root surface. Hold the tooth with gauze or a tooth forceps and plant the tooth as close as possible to it normal position using finger pressure. Press tooth firmly into its socket simultaneously checking position. Patient should feel a click for ideal positioning and seating. The tooth must be splinted to adjacent stable tooth until patient is seen by maxillofacial on call or dentist. Splinting may be improvised with mouth guards, 'silver' packet from suture material or even chewing gum. Instruct the patient to bite down on gauze or the mouth guard to assist repositioning. Send patient to the on-call dentist.

Unrestricted tooth movement may interfere with vascular supply and jeopardize the survival of the tooth.
Displacement / Subluxation / Concussion: The tooth may be in abnormal position in comparison to adjacent teeth. The patient complains of looseness, improper position, deformity, problem with bite or chewing, there may be sensitivity to pressure and percussion, gingival bleeding.

Intrusive Displacement typically involves disruption of the alveolar socket, periodontal ligaments and injury to underlying marrow. Pulpal necrosis occurs in 96% of intruded teeth.
Concussion refers to injury to the periodontal structures supporting the tooth, but without displacement.

Treatment: as above, leave intruded teeth alone; reposition only *luxated, extruded or avulsed* teeth only. Urgent referral to MaxFax team. If marginal problem only, then patient to see own dentist the next day.

Crown Fractures: 1/3 of the dental injuries. Usually incomplete fracture or cracks in the enamel. Refer to patients own dentist.

Alveolar Fracture: pain likely, detected with palpation of sockets and gum line. Do place broken tooth. Urgent dental referral.

Post Operative Haemorrhage / Bleeding after Tooth Extraction
Bleeding occurring longer 4 hours or delayed recurrent bleeding

Treatment: Pressure. Have the patient bite a tightly folded moistened 2x2 gauze. Recheck in 20 minutes. If unsuccessful, infiltrate 2% lignocaine and adrenaline 1:200000 locally *(palatal / buccal / inferior & superior alveolar nerve blocks)* and wash the socket. Packs with Gelfoam, Surgicel as haemostatic agents are helpful. If still unsuccessful, suture any gum tears with a horizontal mattress suture with an absorbable material. The idea is not to close the open wound but to tense the surrounding mucoperitoneum to produce localised ischaemia to arrest bleeding.
If unsuccessful refer to dentist. Involve Seniors in department.

Periodontal Abscess
Associated with periodontal or endodontal disease or both. Abcess formation in the supporting tissues and membranes around the base of the teeth. Usually caused by dental caries.
Diverse flora: anaerobes, streptococci, bacteriodes common.
If fever, lymphadenopathy, tooth mobility, or odema of soft tissues then a *Periapical abscess* has formed.
The patient has gingival swelling and inflammation, localised pain worse with biting. Pulpal pain is throbbing, radiating (ear, temple, cheek) pain. Worse with cold/heat. There may be purulent exudates or blood when the tissue is palpated. The tooth may be tender to percuss. Communication between the gingival sulcus and the abscess indicates periodontal involvement.
Treatment: Refer to Dentist.
Antibiotics: Penicillin V OR Augmentin OR Erythromycin + Metronidazole. Clindamycin is an alternative. Analgesics._