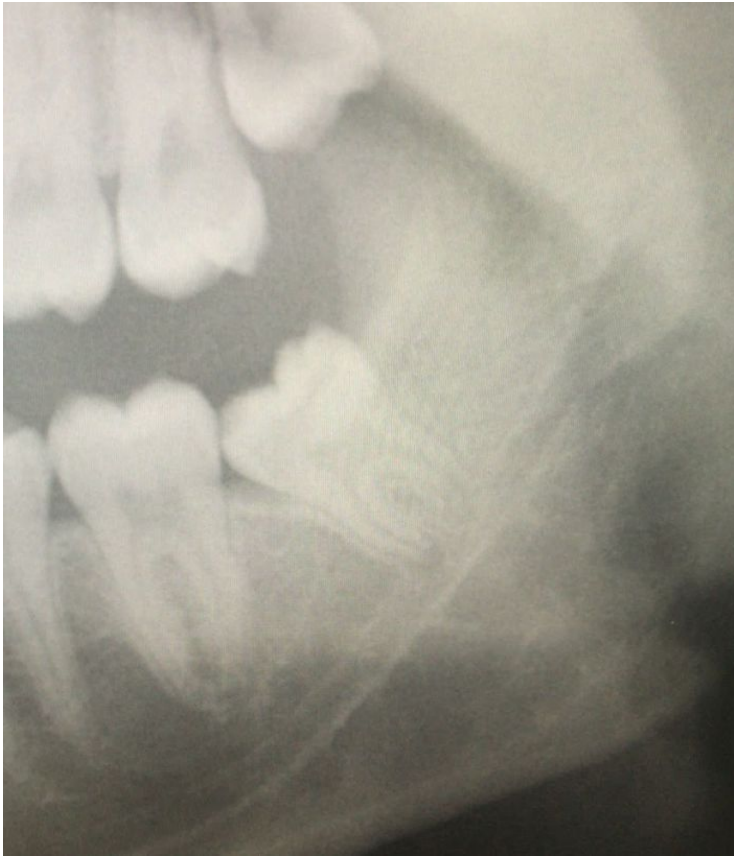


Management of the Medically Compromised Patient

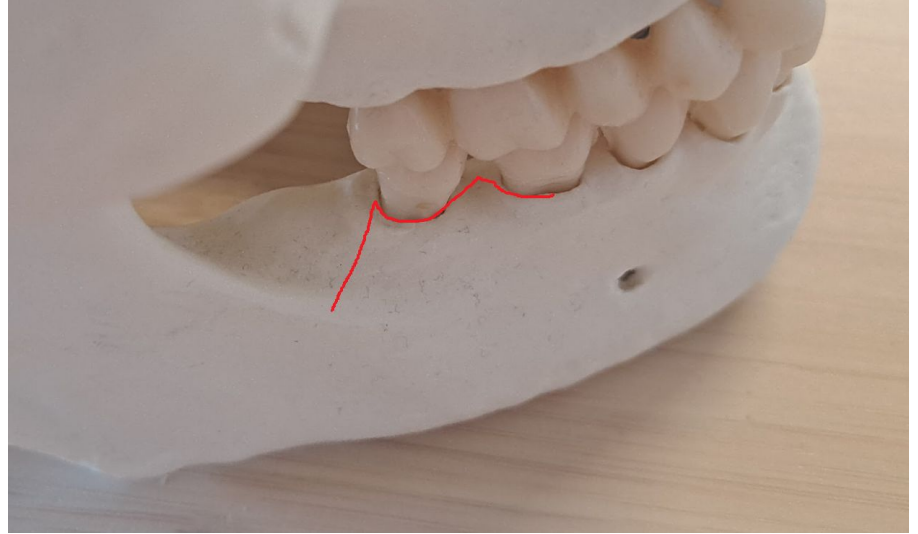
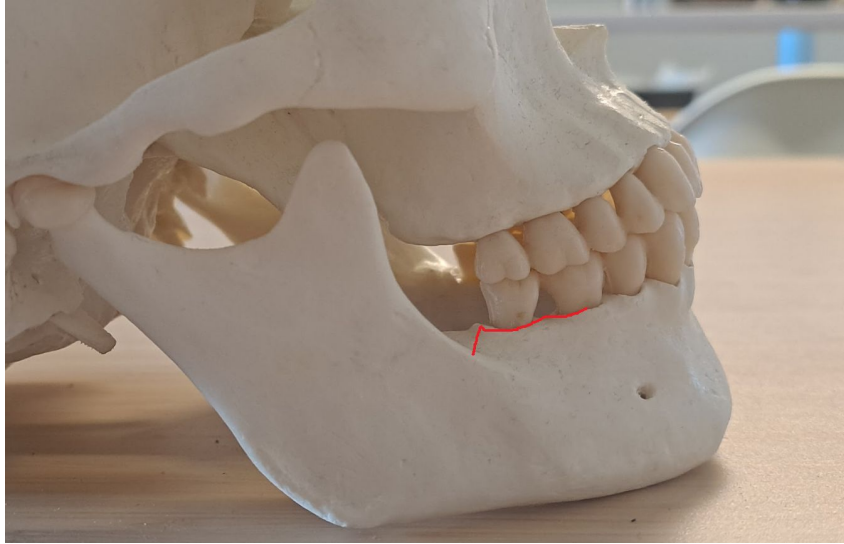
Dr Ven Woo
Dr Ken Lin

Disclaimer

- This talk is aimed to give a practical approach to cases seen in the Oral & Maxillofacial Surgery extraction clinics and potentially in future practice for graduating dentists.
- As accurate as possible (backed by literature) but please do not only rely on this lecture for your exams.
- Contents of the lecture are based on our clinical experience and what we were taught. There may be some discrepancies among preferences and approaches to treatment compared to other clinicians. There are multiple ways to do things.
- The authors of this talk do not accept any responsibility or liability relating to the use of this information.







Lecture Overview

How to take a medical history

Increased bleeding risk

Medication-related osteonecrosis of the jaw (MRONJ)

Osteoradionecrosis (ORN)

Diabetes Mellitus (DM)

Adrenal suppression

Conditions that require antibiotic prophylaxis

Case discussions

How to take a medical history

Patient assessment

Medical history

- Previous and current conditions
- Prior surgical history

Medications

- Prescribed
- Over-the-counter

Drug allergies and reactions

- True allergy vs. adverse event
- Reaction

Social history

- Occupation
- Smoking status
- Use of alcohol
- Illicit substances

Often you will need to prompt patients about their medical conditions and medications that they are taking!

Add Medical History

CARDIAC Yes No N/A Specify Details

Heart Disease

Rheumatic Fever

Blood Pressure Problems

LUNG

Asthma

Other Lung Conditions

ALLERGIES

General Allergy

Medication Allergy

Latex Allergy

OTHER

Diabetes

Epilepsy

Bleeding

Kidney Problems

Hepatitis/Liver Disease

HIV/Hepatitis Test

Pregnancy

Other Medical Problems

Current Medication

Smoking

Prev. Hospitalisation

Parent/Guardian (if child)

Doctor

Specialist

Other Information

Entry Date

Entry Time

Entered By:

OK

Cancel

Increased bleeding risk

Increased bleeding risk may result from either the presence of bleeding condition or use of medications that affect physiological haemostatic process

Bleeding conditions can be either acquired or congenital

Haemostasis

Primary haemostasis: formation of platelet plug from the interaction between von Willebrand factor and injured endothelium

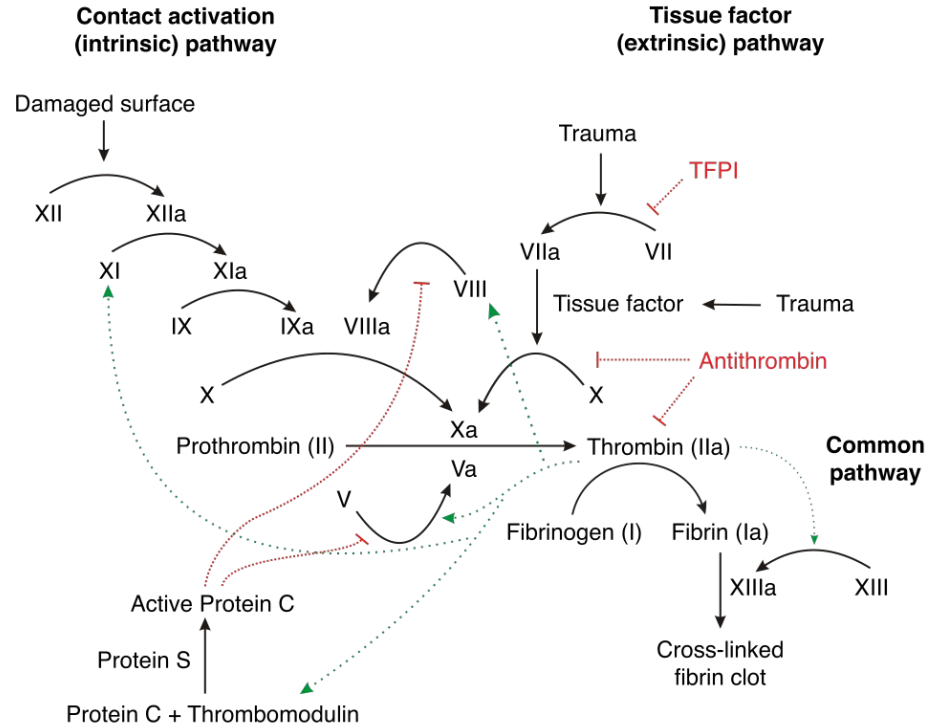
Secondary haemostasis: activation of coagulation factors to form a fibrin mesh to stabilise the platelet plug

Tertiary haemostasis: fibrinolysis is activated to dissolve the platelet plug and return the normal architecture of the endothelium, smooth endothelial lining and normal lumen size.

Phases of haemostatic process:

1. Endothelial injury and formation of platelet plug
2. Propagation of clotting process by the coagulation cascade
3. Termination of clotting by antithrombotic control mechanisms
4. Removal of clot by fibrinolysis

Clotting Cascade



Bleeding conditions

Acquired

- Vitamin K deficiency
- Liver failure
- Thrombocytopenia

Congenital

- Von Willebrand disease (vWD)
- Haemophilia A, B
- Idiopathic thrombocytopenic purpura
- Factor V deficiency
- Factor X deficiency

Conditions mentioned require involvement of a haematologist prior to any dentoalveolar surgery, these patients may be better treated at a specialist service centre

Refer to a specialist service with both haematology and OMFS (tertiary hospital) to allow for coordinated care of the patient and pre-op optimisation

Medications

Antiplatelets

- GPIIb/IIIa inhibitors
 - Abciximab
 - Tirofiban
- ADP inhibitors
 - Clopidogrel
 - Ticagrelor
- COX inhibitors
 - Aspirin

Be aware that patients can be on dual antiplatelets!

Anticoagulants

- Vitamin K antagonist
 - Warfarin
- Direct factor IIa antagonist
 - Dabigatran
- Direct factor Xa antagonist
 - Apixaban
 - Rivaroxaban

Clinical considerations

Need to recognise in workup prior to surgery

- MHx is imperative!

If there is suspicion of major or uncontrollable haemorrhage during a dentoalveolar procedure, the patient must be promptly transferred to a tertiary or specialist setting for management

Blood test

Consider limiting the number of teeth extracted in a single appointment to three or fewer

Pack and suture for all patients with an increased bleeding risk and ensure haemostasis achieved prior to D/C

- Pack haemostatic agent in socket only - do not need to overfill
- Suture across the socket - cruciate/figure-of-eight

Clinical considerations



Haemostatic agents

LA infiltration

Suturing

Gauze pressure +/- impregnation

Cellulose

Gelatin foam

Thrombin

Fibrin

Tranexamic (TXA) mouthwash

Calcium alginate

Bone wax

Haemostatic agents

| Brand name | Material | Mechanism of action |
|--------------------|-------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Spongostan/Gelfoam | Gelatin sponge | Acts as a scaffold for formation of blood clot. Absorbs blood or fluid up to 40 times its weight, and it expands up to 200 percent in its dimensions. |
| Surgicel | Cellulose | Cellulose, oxidized regenerated is saturated with blood at the bleeding site and swells into a brownish or black gelatinous mass which aids in the formation of a clot. |
| Bone wax | Beeswax | Controls bleeding by acting as an impenetrable mechanical barrier at the site of bleeding. |
| TXA | Antifibrinolytic Synthetic derivative of lysine | Reversible competitive inhibitor to the lysine receptor found on plasminogen. The binding of this receptor prevents plasmin from binding to and ultimately stabilizing the fibrin matrix. |
| Silver nitrate | | Chemical cauterisation of blood vessels |

Management of patients on antiplatelets

Use of antiplatelets: prevention of stroke and ischaemic cardiovascular disease

Do not cease prior to dentoalveolar surgery – associated risk for the underlying medical indication exceeds any benefit of the reduction of intraoperative bleeding

Level of bleeding readily controlled with local haemostatic agents

Management of patients on warfarin

INR is used as a surrogate marker of a patient's coagulation function while on warfarin

Warfarin has a narrow therapeutic range, and varies significantly between patients

Effects of warfarin on coagulation is highly susceptible to interactions with other drugs or systemic medical conditions that can affect liver function

INR should be checked 24 hours prior to any dental extractions

- Aim is INR < 4

Need to employ local haemostatic measures: pack and suture, direct pressure with gauze soaked in TXA for 30 minutes post-extraction, use of TXA mouthwash TDS for 3-5 days postoperative

Management of patients on DOACs

Do not require blood monitoring as anticoagulant effect is predictable across individuals taking the same dose of medication

Use the same protocol as for patients who are taking warfarin

- Minor dentoalveolar surgery – do not cease anticoagulant medication, use of local haemostatic measures
- Major dentoalveolar surgery – consult with medical practitioner or refer to OMFS

Postoperative bleeding

Primary haemorrhage:

Bleeding that occurs during the intraoperative period.

Reactionary haemorrhage:

Takes place within 24 to 48 hours postoperatively, where the patient's BP normalises once intraoperative hypotension and vasoconstriction have reversed.

Secondary haemorrhage:

Occurs between 7 to 10 days postoperatively. Often occurs due to postoperative infection that causes erosion of the blood vessels.

Medication-related osteonecrosis of the jaw

Definition - AAOMS

- Exposed bone or bone that can be probed through an intra-oral or extra-oral fistula(e) in the maxillofacial region that has persisted for more than 8 weeks
- Current or previous treatment with anti-resorptive or anti-angiogenic agents
- No history of radiation therapy to the jaws or obvious metastasis to the jaws

Associated with pain, swelling, exposed bone, local infection and pathological fracture of the jaw.

First reported cases in 2003 and 2004 (Carter and Goss, 2003; Marx, 2003; Ruggiero et al., 2004)

Staging

| Stage | Description |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| At risk | Exposure to antiresorptives |
| Stage 0 | Symptomatic Radiographic changes No exposed bone |
| Stage 1 | Asymptomatic Exposed bone No inflammation or infection |
| Stage 2 | Symptomatic Exposed bone Adjacent soft tissue inflammation or secondary infection |
| Stage 3 | Symptomatic Full thickness bone involvement beyond the region of the alveolar bone Pathological fracture Extensive soft tissue infection and fistulae Osteolysis extending to the inferior border of the mandible or sinus floor |

Pathophysiology

1. **Bone remodelling inhibition**
2. Inflammation and infection
3. Angiogenesis inhibition
4. Soft tissue toxicity
5. Innate or acquired immunity dysfunction

Triggers

Dental extractions

Denture trauma including exostoses

Other dentoalveolar surgery including implant surgery

Dental infection including periodontal disease, suppuration

Medical factors: chemotherapy, smoking, corticosteroid use

Patient factors: malignancy, immunocompromised, previous history of MRONJ

Medications associated with MRONJ

- Bisphosphonates
 - Risedronate
 - Alendronate
 - Tiludronate
- RANKL inhibitors
 - Denosumab
- Antiangiogenics
 - Bevacizumab
 - Sunitinib
- DMARDS
 - Methotrexate

History and examination:

- Indication
- Duration
- Dose and frequency
- Who is prescribing the medication?
 - GP
 - Endocrinologist
 - Oncologist
 - Rheumatologist
- Previous history of dental extractions
- CTX results

Bisphosphonates

MoA: inhibitors of osteoclasts

Dose

- Alendronate (Fosamax): oral 70mg once a week
- Risedronate (Actonel): oral 5mg once daily OR 35mg once a week OR 150mg once a month

Half-life

- Alendronate: 10 years
- Risedronate: 20 days

Risks:

- MRONJ (Mavrokokki et al., 2007)
 - 1 in 296-1130 cases oral bisphosphonates (osteoporosis)
 - Cf. 1 in 11-15 IV bisphosphonates (malignancy)
- GI - reflux, oesophagitis, ulcers
- Musculoskeletal pain
- Hypocalcaemia
- Atypical femur fractures

Alendronate higher risk than risedronate for MRONJ

Denosumab

MoA: RANK ligand inhibitor; inhibits osteoclast function and associated bone resorption

Dose: 60mg SC every 6 months

Half-life: 25-32 days with effects dissipating within 6 months of cessation of treatment

Risks

- MRONJ
- Hypocalcaemia
- Increased risk of fractures after ceasing denosumab
- Vertebral fractures
- Atypical femoral fractures

Denosumab

MRONJ on denosumab: 0.68% up to 2.6% (Goss et al., unpublished; Watts et al., 2019)

- Higher risk if denosumab is administered soon after dental extractions or previous history of bisphosphonates

Timing of extractions

- 4-6 months after last Prolia injection
- ?CTX
- Wait one month post-extraction to allow for primary bone healing to occur before recommencing denosumab

Clinical Presentation



Prevention of MRONJ

Risk assessment

CTX

Drug holidays

Oral hygiene optimisation

Atraumatic extraction technique

Prevention of MRONJ

CTX (Marx et al., 2007; Hutcheson et al., 2014)

- < 100 pg/L: high risk
- 100-150 pg/L: moderate risk
- > 150 pg/L: minimal risk

Drug holidays

- To consider ceasing bisphosphonate therapy until fasted CTX > 150 pg/L in patients with a history of bisphosphonates > 4 years or on concurrent glucocorticoids
- One month drug holiday = CTX rise of 25 pg/L (Kunchur et al., 2009)

Prevention of MRONJ

Adelaide MRONJ Protocol

Timing of extractions

- Bisphosphonates: CTX > 150 pg/L
- Denosumab: 1-2/12 before next injection

Intraoperative

- Surgicel, Spongostan
- Sutures - aim for primary closure

Review

- 2/52, 6/52, 12/52
- Dx MRONJ at 8/52 months postoperative

Controversies

CTX:

- Expensive test
- Requires patients to fast
- ?Medicare cover
- Several confounding factors that influence CTX results
- Has been shown to have no predictive value in determining the risk for MRONJ in patients taking bisphosphonates (Dal Prá et al., 2017)

Drug holidays have not shown to alter the risk of MRONJ following tooth extraction – not advised by AAOMS Position Paper 2014

Impact on patients with MRONJ

Reduced quality of life

- Marked weight loss
- Unable to eat
- Unable to wear dentures

Severe jaw and neck infections

No effective treatment for MRONJ – treatment is often refractory

- Aim is to prevent further progression – requires cessation of antiresorptive therapy
- Non-surgical management for Stage 0 and 1
- Surgical management for Stage 2 and 3

| Stage | Treatment |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| At risk | <ul style="list-style-type: none"> No treatment indicated Patient education + warn of risk of MRONJ |
| Stage 0 | <ul style="list-style-type: none"> Analgesia Oral antibiotics |
| Stage 1 | <ul style="list-style-type: none"> Analgesia Oral antibiotics Antibacterial mouthwash (chlorhexidine 0.2%) Patient education and review of indications for continued antiresorptive therapy Clinical follow-up every 3 months until resolution |
| Stage 2 | <ul style="list-style-type: none"> Analgesia Oral antibiotics Antibacterial mouthwash (chlorhexidine 0.2%) Clinical follow-up every 3 months until resolution Debridement to relieve soft tissue irritation and infection control |
| Stage 3 | <ul style="list-style-type: none"> Analgesia Oral antibiotics Antibacterial mouthwash (chlorhexidine 0.2%) Surgical debridement/resection for long term palliation of infection and pain |

NB.

- Regardless of staging of disease, mobile segments of bony sequestrum should be removed without exposing uninvolved bone.
- Extraction of symptomatic teeth within exposed, necrotic bone should be considered since it is unlikely that the extraction will exacerbate the existing necrotic process.

Osteoradionecrosis of the jaw

Irradiated patients

Radiation therapy in conjunction with surgery is an established treatment modality for H&N cancers.

Effects of radiation devastate normal oral physiology, resulting in mucositis in the short term and hyposalivation, caries, periodontal disease and scarring in the long term.

Patients who require dentoalveolar extractions post-radiation therapy are at a risk for osteoradionecrosis of the jaw. ORN can occur spontaneously just as with MRONJ.

Definition

An area of exposed devitalised irradiated bone that fails to heal over a period of 3-6 months in the absence of local neoplastic disease.

The risk of ORN is life long and there is no amount of time elapsed after which is it considered 'safe' to remove teeth in the radiation field.

Risk factors

- Mandible > maxilla
- Cumulative dose of > 60 Gray of radiation
- Staging of tumour
- Malnutrition
- Poor oral hygiene
- Immunosuppression
- Dental extractions

Always ask for the radiation fields and the location of radiation (maxilla, mandible, neck)

Pathogenesis of ORN

Hypoxia-hypocellular-hypovascular tissue theory (Marx, 1983)

1. Radiation therapy
2. Hypoxia-hypocellular-hypovascular tissue formation
3. Tissue breakdown
4. Chronic- non-healing wound

Not a primary infection of irradiated bone
Basis for HBO therapy

Radiation induced fibroatrophic process
(Delanian and Lefaix, 2004)

1. Pre-fibrotic phase
Chronic inflammation resulting in the presence of collagen degradation products and destruction of endothelial cells □ activation of fibroblasts
2. Constitutive organised phase
Dominance of abnormal fibroblastic activity, disorganisation of ECM
3. Late fibroatrophic phase
Formation of friable and poorly vascularised tissue following attempted tissue remodelling

Clinical staging of ORN

Stage I ORN

- Superficial involvement of the mandible only
- Soft tissue ulceration is minimal
- Only the exposed cortical bone is necrotic
- Conservative management



Clinical staging of ORN

Stage II ORN

- Localised involvement of the mandible
- Exposed cortical bone and underlying medullary bone are necrotic
- Due to periodontal disease, non-healing socket after extraction or progression from Stage I
- Conservative management

Division A: soft tissue ulceration is minimal

Division B: soft tissue necrosis, including oro-cutaneous fistula



Clinical staging of ORN

Stage III ORN

- Diffuse involvement of the mandible
- Full thickness bone involvement including the lower border
- Risk of pathological fracture
- Requires surgical intervention

Division A: soft tissue ulceration is minimal

Division B: soft tissue necrosis, including oro-cutaneous fistula



Prevention: Prior to radiation therapy

Prophylactic dental care prior to, during and after RT

Optimal time for dental extractions prior to RT is > 2 weeks

Optimal oral hygiene including fluoride/Tooth Mousse application nightly during RT

Regular dental check ups

Prompt treatment of cervical and root caries, particularly for patients with xerostomia

Prevention: Hyperbaric oxygen therapy

- Postulated that oxygen is required in wound healing
- Complements Marx's hypoxic-hypocellular-hypovascular tissue theory
- Incidence of ORN with the use prophylactic HBO is 4% (Nabil and Samman, 2011)
- For patients who have received > 60 Gy radiation to the maxilla/mandible
- Marx Protocol
 - 20 sessions of 90 minutes at 2.4 atmospheres prior to dental extraction
 - 10 sessions of 90 minutes postoperatively

Current guidelines for patients requiring treatment through SA OMFS Unit

Prevention: Hyperbaric oxygen therapy

- Limitations
 - Requires at least 1 month of preparation prior to dental extractions
 - Not easily available outside capital cities
 - Expensive
- Contraindications
 - COPD
 - Poorly controlled chronic heart failure
 - Active malignancy
- Complications
 - Middle ear barotrauma
 - Myopia
 - Pneumothorax
 - Arterial air embolism
 - Oxygen toxicity seizures
 - Pulmonary oxygen toxicity
 - Acute pulmonary oedema

Prevention: Antibiotic prophylaxis

- Antibiotics used include penicillin or clindamycin
- Use is not supported by pathophysiology
- Used to prevent infection in impaired tissues
- Incidence of ORN with the use of prophylactic antibiotics is 6% (Nabil and Samman, 2011)

Prevention: Intraoperative

Aim for atraumatic extraction

Limit the number of teeth for extraction per session

Consider alveoloplasty and removal of any loose bony fragments

Pack and suture of sockets

0.2% Chlorhexidine mouthwash

Management of ORN of the jaw

Stage I: conservative management

- Hyperbaric oxygen therapy 20/10
- Local wound care including 0.2% chlorhexidine mouthwash
- Antibiotics

Stage II: conservative management

- Hyperbaric oxygen therapy 20/10
- Local wound care including 0.2% chlorhexidine mouthwash
- Antibiotics
- Debridement or sequestrectomy

Stage III: surgical management

- Surgical extirpation of all diseased hard and soft tissue with immediate reconstruction with a free tissue flap

Management of ORN of the jaw: PENTO

Pentoxifylline 800mg + tocopherol (vitamin E) 1000IU (Delanian et al., 2005)

- Pentoxifylline: improve blood flow and viscosity to improve the vascularity of tissues
- Tocopherol: anti-oxidant, thought to scavenge reactive oxygen species

Used to counteract the development of radiation-induced fibrosis

Has been shown that when used in combination can result in bony union of

Stage III ORN (Breik et al., 2019)

Common to now give PENTO for all stages of ORN for at least 6 months

Diabetes Mellitus

Types of DM

T1DM

- Insulin deficiency due to autoimmune pancreatic disease
- Management:
 - Insulin (through injections or pump)

T2DM

- Insulin resistance due to tissue insensitivity to insulin hormone
- Management:
 - Dietary modification
 - Oral hypoglycaemics
 - Insulin

Poorly controlled DM can result in poor wound healing and increased risk of infection

DM medical emergencies

Hypoglycaemia

- Often due to insulin therapy or other hypoglycaemics, fasting/missed meals
- Tremor, irritability, pallor, anxiety
- Diaphoresis, hunger, paraesthesia, blurry vision
- Altered mental consciousness, confusion
- Weakness, slurred speech, seizures

Hyperglycaemia

- Often due to undiagnosed DM, stress, concurrent illnesses including infection, issues with insulin therapy
- Nausea
- Fatigue
- Diaphoresis
- Weakness
- Fruity odour/breath
- Altered mental consciousness, confusion

Clinical considerations

Ascertain if DM is well managed

- BGLs: preprandial 4-7 mmol/L; postprandial 6-10 mmol/L
- HbA1c: < 7%

LA procedures – ideally morning appointments, eat as per normal before procedure

Request for BGLs if patient is not feeling well and are known to have DM

Oral glucose solutions are available in clinic if concerned about hypoglycaemic episode

Hypoglycaemia and hyperglycaemia are medical emergencies!

Adrenal suppression

Adrenal suppression

Glucocorticoids are endogenous hormones that are produced by the adrenal glands

Known for their anti-inflammatory effects

Dose equivalence:

1mg cortisol

= 1mg hydrocortisone

= 0.25mg prednisolone

= 0.04mg dexamethasone

Conditions which corticosteroids are commonly prescribed:

- GI
 - Crohn's disease
 - Coeliac disease
 - Ulcerative colitis
- Respiratory
 - Asthma
 - COPD
 - COVID-19
- MSK
 - Acute muscle or joint injury
 - Inflammatory arthritis e.g. rheumatoid arthritis
- Integumentary
 - Lichen planus
 - Vesiculobullous disease
- Vasculitis
 - Granulomatosis with polyangiitis (Wegner's granulomatosis)
 - SLE
 - Giant cell arteritis
- Adrenal
 - Adrenal insufficiency

Adrenal Crisis

Part of the physiological response to stress is the production and release of glucocorticoids. Glucocorticoids are not stored, but produced when needed, adrenal suppression by primary insufficiency or by exogenous glucocorticoids will result in the inability of the adrenal glands to produce sufficient steroids to meet physiological and homeostatic requirements during stress.

This can result in an adrenal crisis
(**medical emergency!**)

Signs and symptoms:

- Diaphoresis
- Hypotension
- Critical electrolyte abnormalities
- Cyanosis
- Vomiting
- Weakness

Can further progress to hypothermia, severe hypotension, hypoglycaemia, confusion, circulatory collapse and death

Adrenal suppression: dental considerations

Uncommon after dentoalveolar surgery, but awareness is required in every patient taking regular steroid therapy. Patients who are at higher risk are those who use a dose of at least 7.5mg prednisolone per day for at least two weeks.

Greater surgical stress has a higher propensity to result in adrenal crisis. Need to consider the difficulty of the procedure, age of the patient, any existing infection and anticipated postoperative pain.

Patients who are noted to be at an increased risk for adrenal insufficiency following surgery should be considered for a transient increase in steroid dose (“stress dosing”) in the perioperative period (doubling of dose one hour prior to dentoalveolar surgery).

Conditions that require antibiotic prophylaxis

Conditions that require antibiotic prophylaxis

Infective endocarditis (IE)

Dental procedures: only those involving manipulation of the gingival or periapical tissue or perforation of the oral mucosa (e.g. extraction, implant placement, biopsy, removal of soft tissue or bone, SRP, replanting avulsed tooth)

Bacteraemia associated with dental procedures usually involves *S. viridans* which is known to cause IE.

Prophylaxis:

- 2g amoxicillin OR
- 2g cefalexin OR
- 600mg clindamycin

One hour prior to procedure

Cardiac conditions for which endocarditis prophylaxis is recommended for patients undergoing a procedure listed in [Box 2.13](#) (Box 2.12)

Endocarditis prophylaxis is recommended only for patients with the following cardiac conditions (that are associated with an increased risk of developing infective endocarditis and the highest risk of adverse outcomes from endocarditis) who are undergoing a procedure listed in [Box 2.13](#) [NB1] [NB2]:

- prosthetic cardiac valve, including transcatheter-implanted prosthesis or homograft
- prosthetic material used for cardiac valve repair, such as annuloplasty rings and chords
- previous infective endocarditis
- congenital heart disease *but only* if it involves:
 - unrepaired cyanotic defects, including palliative shunts and conduits
 - repaired defects with residual defects at or adjacent to the site of a prosthetic patch or device (which inhibit endothelialisation)
- rheumatic heart disease in high-risk patients [NB3].

NB1: Endocarditis prophylaxis is not recommended for patients with forms of valvular or structural heart disease not listed in this box, including patients with mitral valve prolapse, septal defects or cardiac implantable electronic devices.

NB2: Patients with a heart transplant who have developed cardiac valvulopathy may also be at high risk of adverse outcomes from endocarditis; consult the patient's cardiologist for specific recommendations.

NB3: See text below for discussion of patients with rheumatic heart disease.

High risk population: ATSI, low SES

Conditions that require antibiotic prophylaxis

Relative:

- MRONJ risk
- ORN risk
- Prosthetic joint, particularly knee or hip replacement within the past 6 months (need to communicate with orthopaedic surgeon)
- Immunocompromised patients (need to communicate with treating medical specialist)

Case Presentations

Case 1: Mrs JS

50F

Referred from community dentist for extraction of 16

MHx:

- Type 1 diabetes mellitus
- Atrial fibrillation
- Previous MI 3 years ago, with triple cardiac bypass surgery (CABG)
- Congestive heart failure
- Hypertension
- Osteoporosis

Medications

- Insulin injections
- Apixaban
- Perindopril
- Furosemide
- Denosumab injections for the last 3 years

NKDA

Smokes 10 packs a day for last 20 years

Social alcohol drinker



Things to consider before extracting the 16?

Medical factors

- T1DM
 - BSL level on the day?
 - Has she had something to eat on the day? Did she still take her insulin without eating anything?
- AF
 - On apixaban
 - Bleeding risk, what do we need to test before we can extract her teeth?
 - Do we stop the medication?
 - Are there any reversal agents?
- Previous MI with CABG
 - Does she need antibiotic prophylaxis?
- Congestive heart failure
 - Taking an ACE inhibitor and diuretic, what can't we give her?
- Osteoporosis
 - Taking denosumab, what risk factor are we concerned about here?

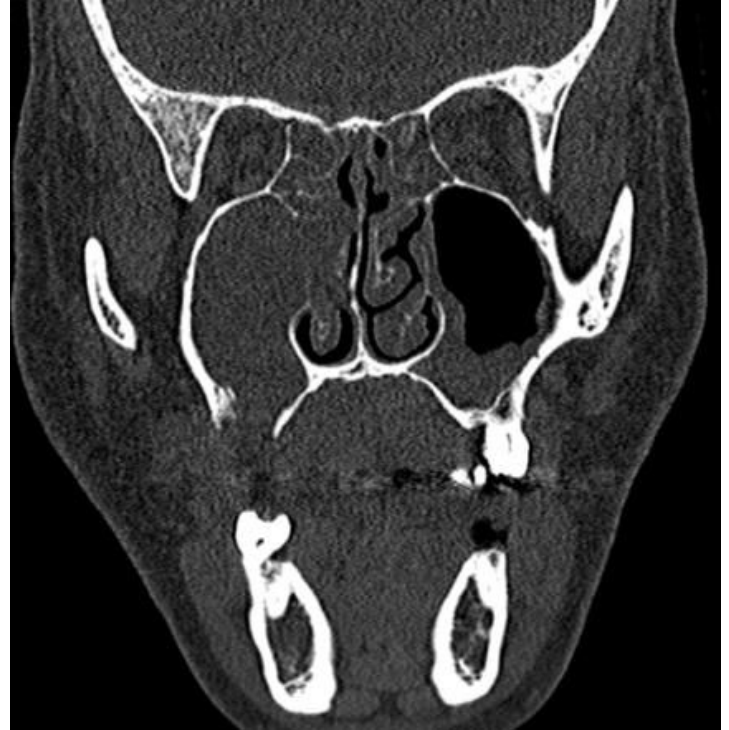
Surgical factors

- Assess OPG
- What risks does extracting the 16 pose?
- How should we manage these risks?

You extract the tooth and she comes back 2 weeks later for review and reports bad smell in nose, bad taste in mouth.

You do a CBCT scan, what do you see?

What would you tell the patient, how would you manage this?



Case 2: FH

70 M

Referred to RDHM from CHC for attempted extraction 38 in February 2021

MHx

- Rheumatoid arthritis

Medications

- Methotrexate
- Prednisolone 5mg for 10 years
- Leflunomide

NKDA

Case: FH



Case: FH

Extraction completed March 2021

1 month later...

Case: FH

Swelling and sore Q3

38 site localised erythema and mild oedema, no suppuration or discharge

Patient then discloses that he is on Prolia injections for osteoporosis

- Last Prolia injection was December 2020

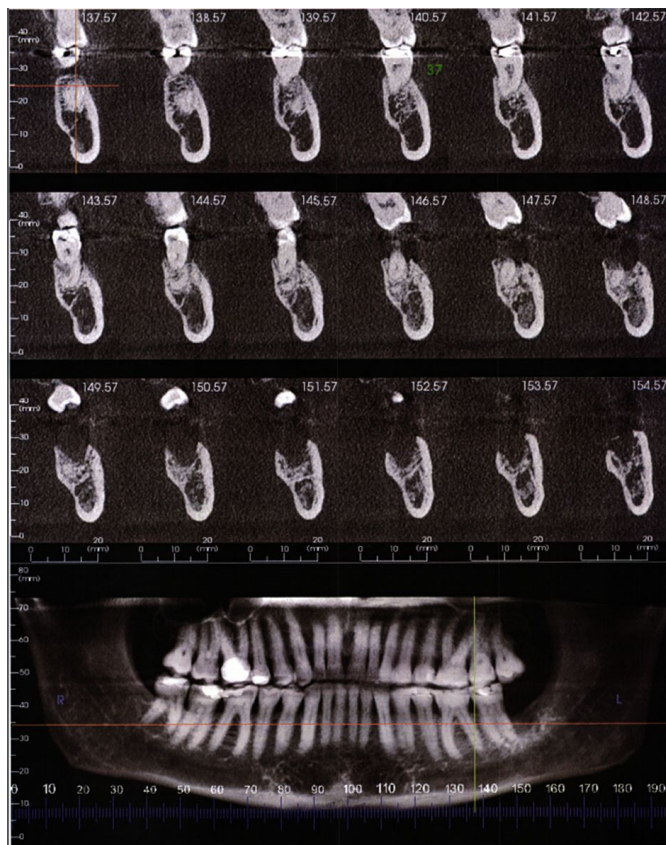
At 8/52, patient is diagnosed with Stage 2 MRONJ

Case: FH



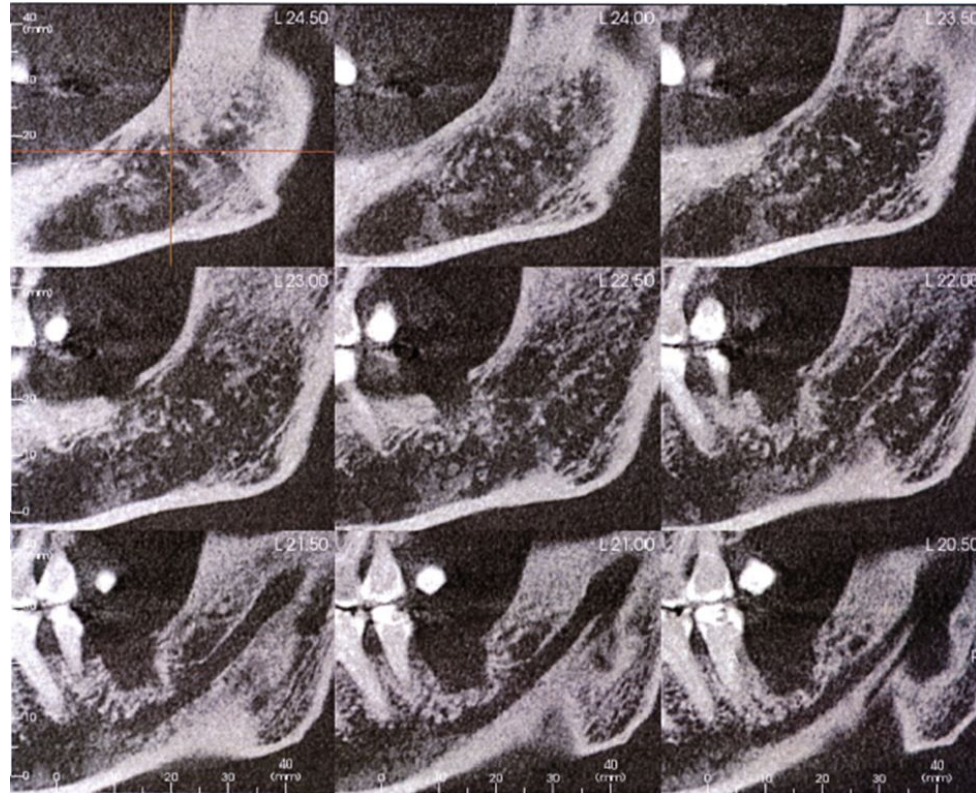
Case: FH

CBCT May 2021



Case: FH

CBCT May 2021



Case: FH

Patient undergoes multiple debridements in June, August, October under LA to remove bony sequestra

Commences golimumab

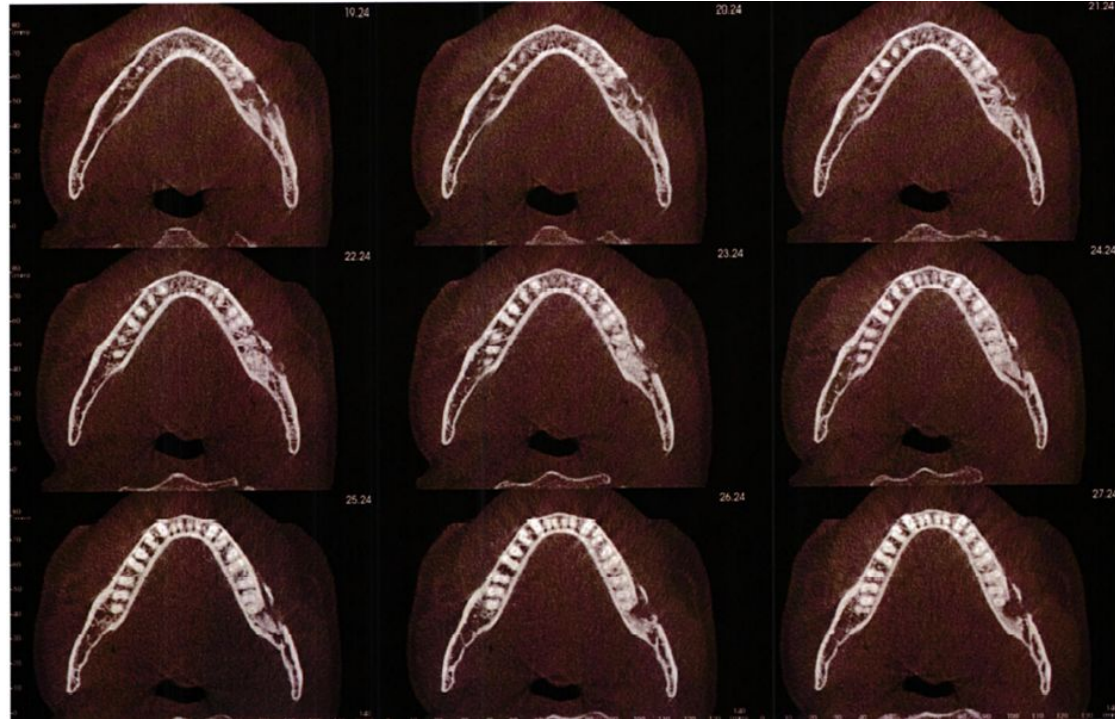
Is on long-term antibiotics (clindamycin)

Ongoing pain, swelling and infection with exposed buccal plate (mobile)

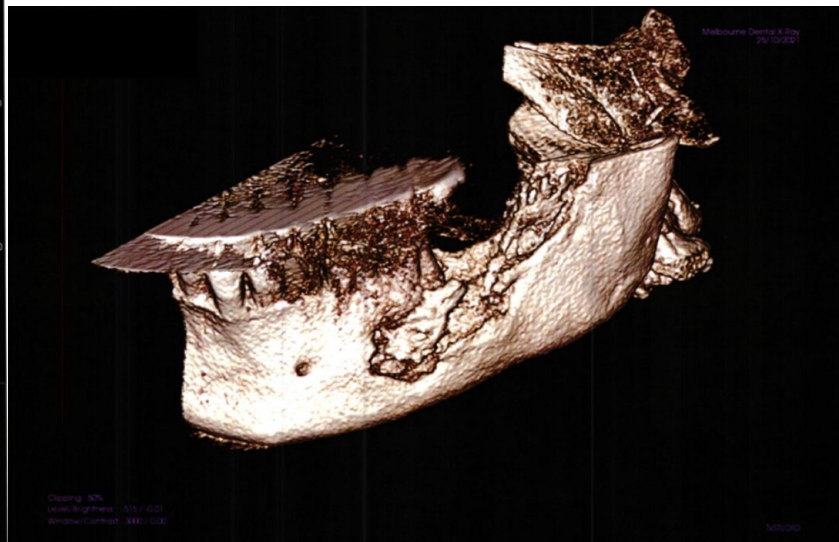
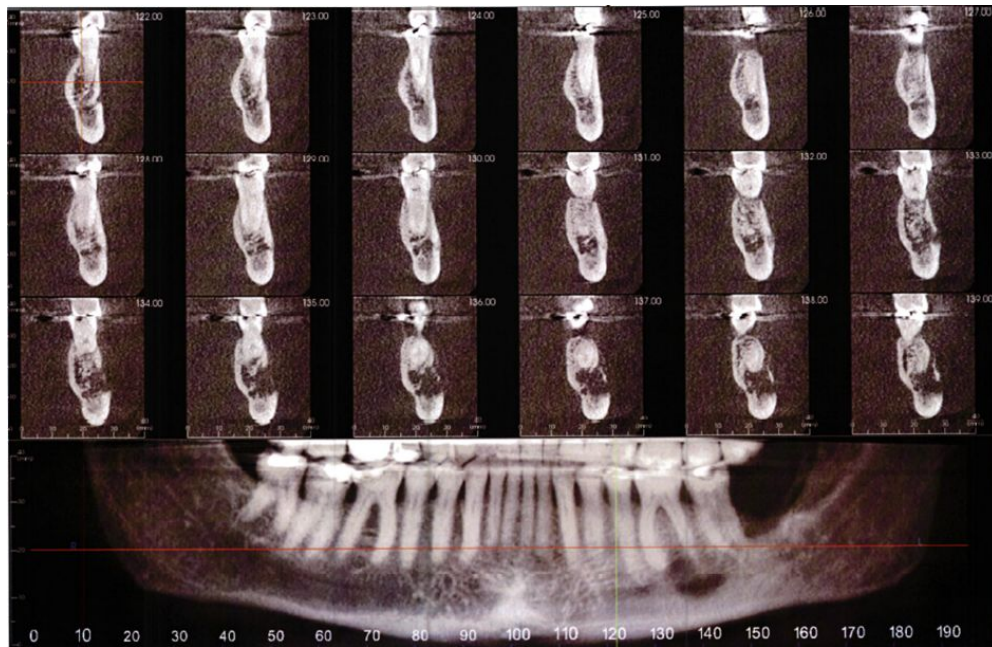
Patient is diagnosed with osteomyelitis October 2021

Case: FH

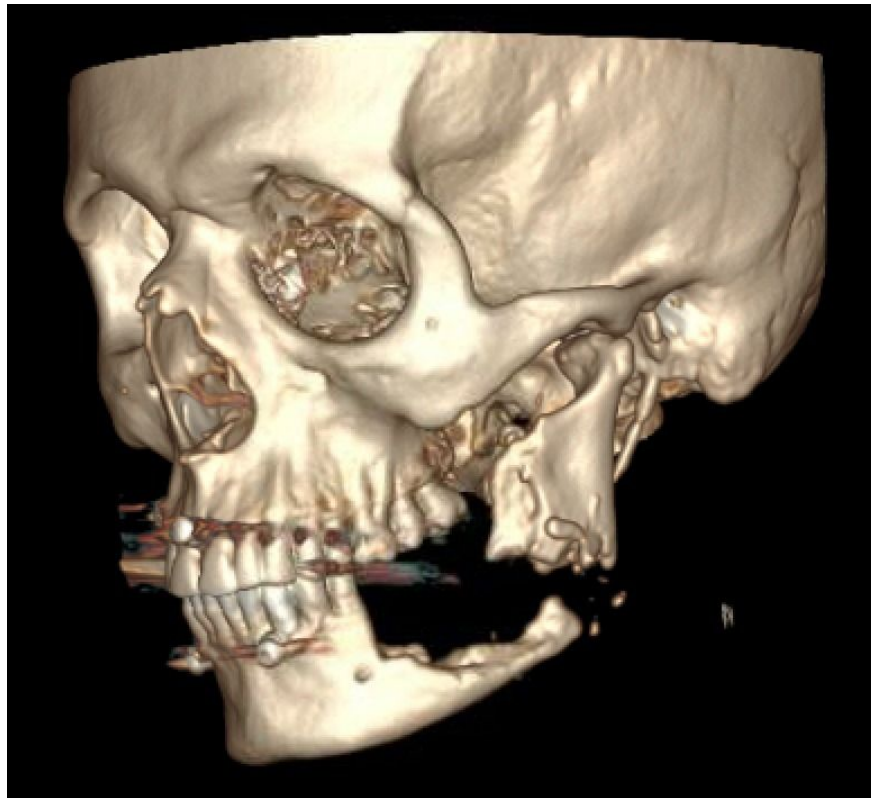
CBCT October 2021



Case: FH



Case: FH



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