

# Intro to Oral Surgery

Lecture 9: Post Operative Management

Dr. Caroline Zeller



# Objectives:

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- Recognize the normal post operative experience for the surgical patient
- Identify post operative risks, complications, and management thereof
- Specific management of bleeding, pain, swelling, dry socket, nerve injury, oral-antral communication, root displacement, non-healing

# Risks and Complications of Dentoalveolar Surgery

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selection

education

prevention

management

# Normal Post-op Experience

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## What it feels like

bleeding < 24 hrs

pain

swelling

bruising

trismus

changes to diet and OH

## "Is it healing?"

socket heals from bottom up

two processes: **gums** and **bone**

**gums** won't cover the bone until **3-4 weeks**

**bone** fills the socket at **4-6 months**

# Normal Post-op Experience

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what to expect

There should be no surprises.

The patient should be aware  
and not surprised by a normal  
post-op experience, OR by a  
complication.

## Normal Post-op Experience

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### pain

goal is pain management, not elimination of all discomfort

- ibu/acet (60/90min onset) before LA wears off - much more difficult to manage once pain becomes severe
- worst pain 12-24 hours after extraction, goes down 2 days after surgery
- if choose to rx something stronger, should not be for more than 3 days worth

# Normal Post-op Experience

## bleeding

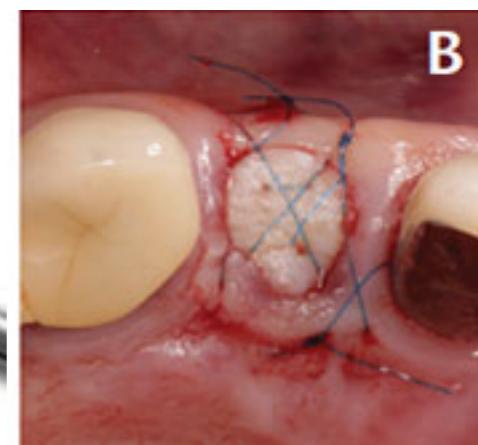
Describe normal:

1. oozing for 24 hrs
2. pressure with moist gauze
3. What to do if it begins to bleed again at home...

"Dont spit, rinse mouth lightly with chilled water and bite for 30 minutes, again with tea bag. Come in. Go to ER if after hours and concerned.

Prevent Excess:

1. Ask about bleeding history
2. Stop (at one) if it looks concerning
3. Remember sources of bleeding: bone, granulation tissue, gingiva
4. If unsure, pack: gelfoam, surgicel, collagen plug



# Hemostatic Agents

bleeding

- Local to be placed directly in socket



Gel Foam



Collagen plug



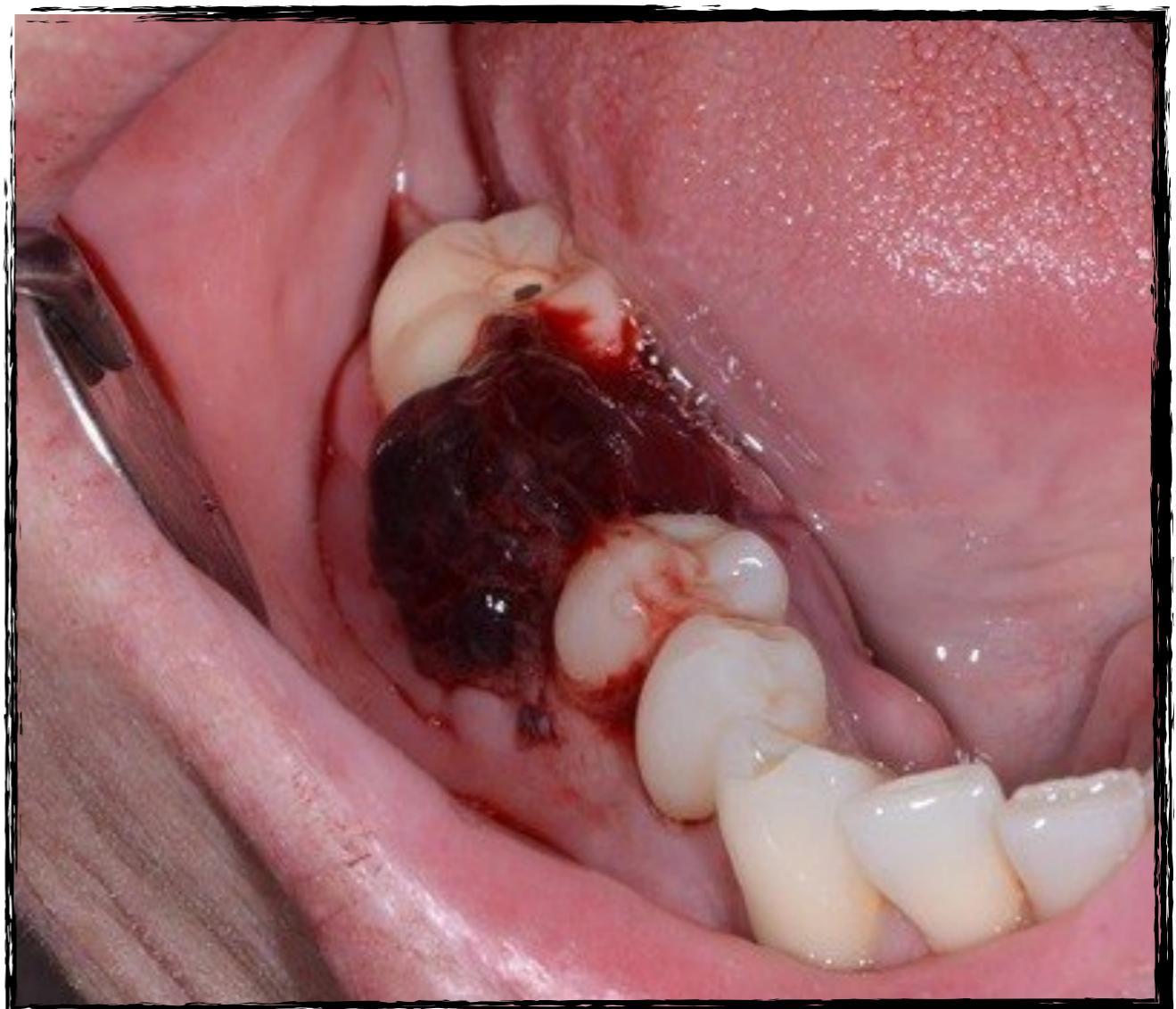
Surgicel

- Electrosurgery
- Vitamin K, thrombin: liquids added to mouth rinse or gauze

# Liver Clot

bleeding

bleeding occurred with  
poor gauze  
placement and/or  
insufficient pressure



# Normal Post-op Experience

## bleeding

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If patient returns:

1. clean, manual pressure for five minutes, inspect for liver clots
- 2. if doesnt work - re-anesthetize, remove clot, find source of bleeding, hemostatic agent and figure 8. Watch for 30 minutes.**

## **Normal Post-op Experience**

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swelling

# Normal Post-op Experience

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## swelling

- max at 36-48 hrs - increased swelling beyond this point could indicate infection
- more in morning
- ice day one - vasoconstriction for bleeding
- nothing day two
- heat day three - vasodilation for swelling

## Normal Post-op Experience

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bruising + trismus

normal

# Normal Post-op Experience

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oral hygiene + diet

Get out of your body's way to do good work.

stay healthy  
glucose control  
normal meds  
eat well  
drink water  
sleep

# Risks & Complications

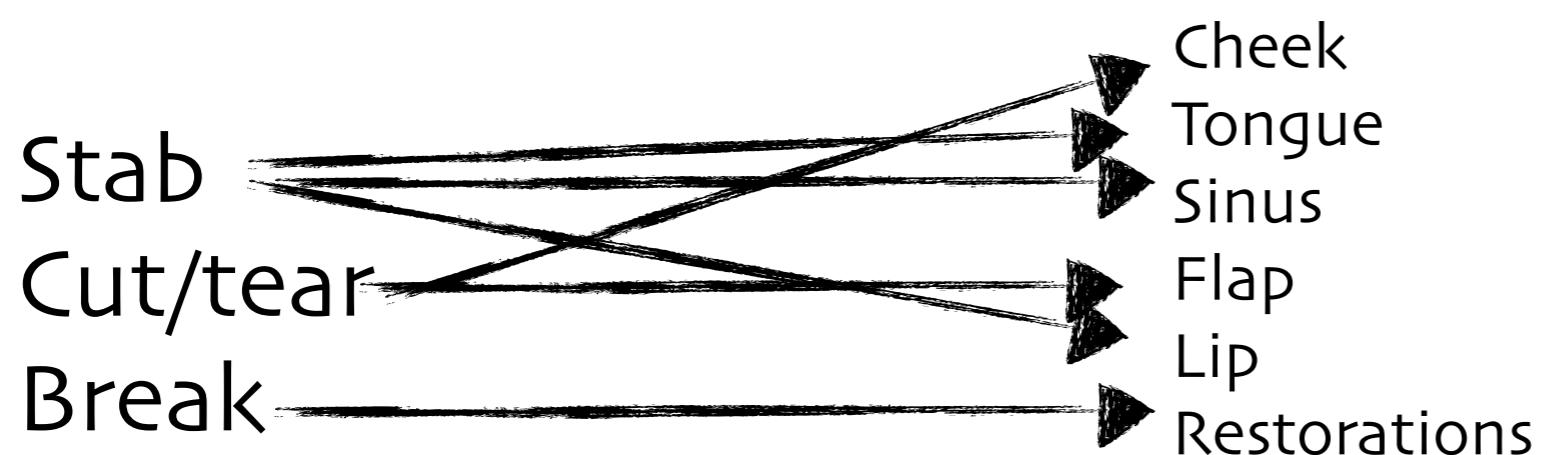
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- “tunnel vision” errors
- alveolar osteitis
- leaving a root tip
- bleeding
- infection
- nonhealing wound
- osteonecrosis
- OA communication
- swelling and trismus
- nerve injury

# Complication Prevention & Management

“tunnel vision”

Too focused on working end of instrument that you...



1. Inform patient
2. Apologize
3. Close/restore if it can be closed/restored

# Complication Prevention & Management

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“tunnel vision”

Extraction of wrong tooth



A note about blame culture in dentistry



Medical errors occur from lack of good protocols and systems

# Complication Prevention & Management

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## alveolar osteitis

### **Efficacy of different methods used for dry socket prevention and risk factor analysis: A systematic review**

Maria Taberner-Vallverdú,<sup>1</sup> Mª Ángeles Sánchez-Garcés,<sup>2</sup> and Cosme Gay-Escoda<sup>✉3</sup>

#### **Conclusions**

All treatments included in the review were aimed at decreasing the incidence of dry socket. Locally administering chlorhexidine or applying platelet-rich plasma reduces the likelihood of developing this complication. Antibiotic prescription does not avoid postoperative complications after lower third molar surgery. With regard to risk factors, all of the articles selected suggest that patient age, history of previous infection and the difficulty of the extraction are the most common predisposing factors for developing dry socket. There is no consensus that smoking, gender or menstrual cycles are risk factors. Taking the scientific quality of the articles evaluated into account, a level B recommendation has been given for the proposed-procedures in the prevention of dry socket.

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# Complication Prevention & Management

## alveolar osteitis

diagnosed on symptoms

appears empty, possible exposed bone, or full of debris

irrigate, dry socket paste on gel foam

does not indicate infection

“The solution is time.”



### Common Complaints

1. Radiating pain to ear (mandibular) or eye (maxillary)
2. “keeps me up at night”
3. “pain meds do nothing”

# Complication Prevention & Management

OA communication

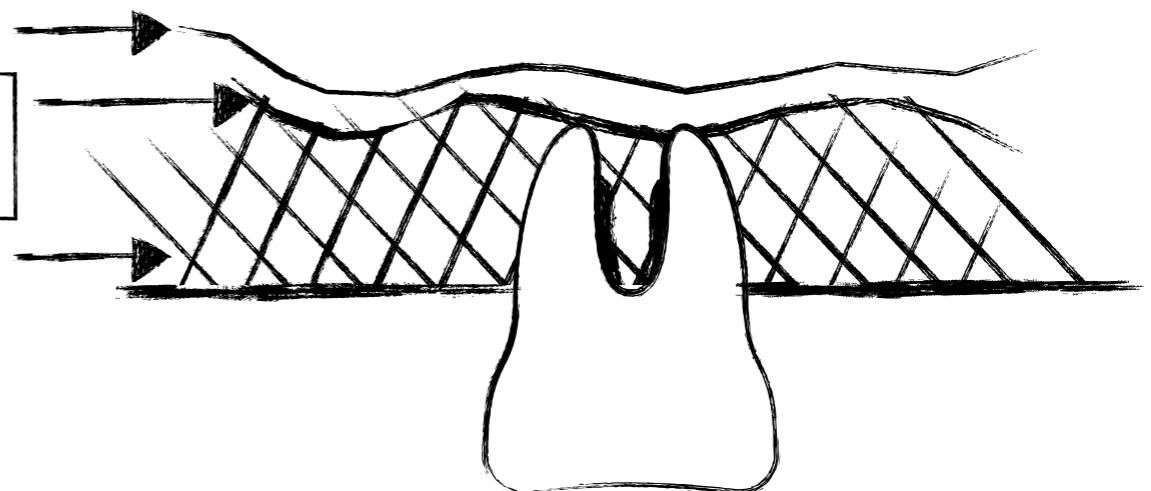
## Oral-Antral Communication



Schneiderian  
Membrane

Floor of  
Maxillary Sinus

Alveolar Bone



# Complication Prevention & Management

## OA communication



## Oral-Antral Communication

Hole can be created from instrument, abscess, or root being removed.

Need hole to close to reduce infections in sinus

Size of opening dictates management

Evaluate image prior to extraction to assess risk.

Risk factors: excessive force, proximity to floor, divergent roots unsectioned (removes interseptal bone)



# Complication Prevention & Management

## OA communication

[Int J Implant Dent.](#) 2019 Dec; 5: 13.

Published online 2019 Apr 1. doi: [10.1186/s40729-019-0165-7](https://doi.org/10.1186/s40729-019-0165-7)

PMCID: PMC6441669

PMID: [30931487](#)

## Decision-making in closure of oroantral communication and fistula

Puria Parvini,<sup>1</sup> Karina Obreja,<sup>✉1</sup> Amira Begic,<sup>1</sup> Frank Schwarz,<sup>1,2</sup> Jürgen Becker,<sup>2</sup> Robert Sader,<sup>3</sup> and Loutfi Salti<sup>1</sup>

### Etiology

Go to:

Identifying the etiology of the OAC is essential to create an effective procedure. Harrison demonstrated that the bone lamella between the maxillary posterior teeth and the maxillary sinus is occasionally 0.5 mm [4]. Thus, the first premolars accounted for 5.3% of OACs, the second molars were the most frequently with an incidence of 45%, followed by the third molars 30% and the first molars 27.2%. It was reported that about 2.2% of the first molars apices perforated the maxillary sinus floor, followed by the second molars 2% of the described cases [4]. Due to the close relationship of the roots to the antrum and partially very thin maxillary sinus floor, the extraction of the upper molars and premolars, especially the extraction of the first molars, is considered the most common etiology of OAC [5–7]. Pathological lesions in the sinus, trauma, and failed external sinus floor elevation and augmentation can also lead to the formation of an OAC. Oroantral communication may be developed as a result of prevalence of the inflammatory odontogenic pathologic processes through the maxillary alveolar process to the Schneiderian sinus membrane. Periodontal infections and other factors are the least prevalent. Further complications of OAC may result from the removal of cysts or tumors, implant placement, maxillofacial surgery (Le Fort osteotomies), and pathological procedures like osteomyelitis. In addition to the size of the defect, possible maxillary sinusitis, odontogenic infections, cysts, tumors, foreign bodies in the maxillary sinus, and osteitis and osteomyelitis changes also likely play a crucial role in the formation of a chronic oroantral fistula. Furthermore, improper treatment of OAC can produce maxillary sinusitis and become chronic [8]. Figure 1 illustrates the etiologic factors of OAC/OAF/chronic OAF.

# Complication Prevention & Management

## OA communication

A physical barrier must be created to separate the two spaces to decrease infection risks.

Size dictates treatment.

< 2mm = can close on its own, often place barrier (gel foam or plug)

3mm - 6mm = place barrier and close with suture

>6mm = will need primary closure by advancing buccal flap

Often prescribed abx to decrease infection risk (Augmentin).

Sinus precautions always a good idea.

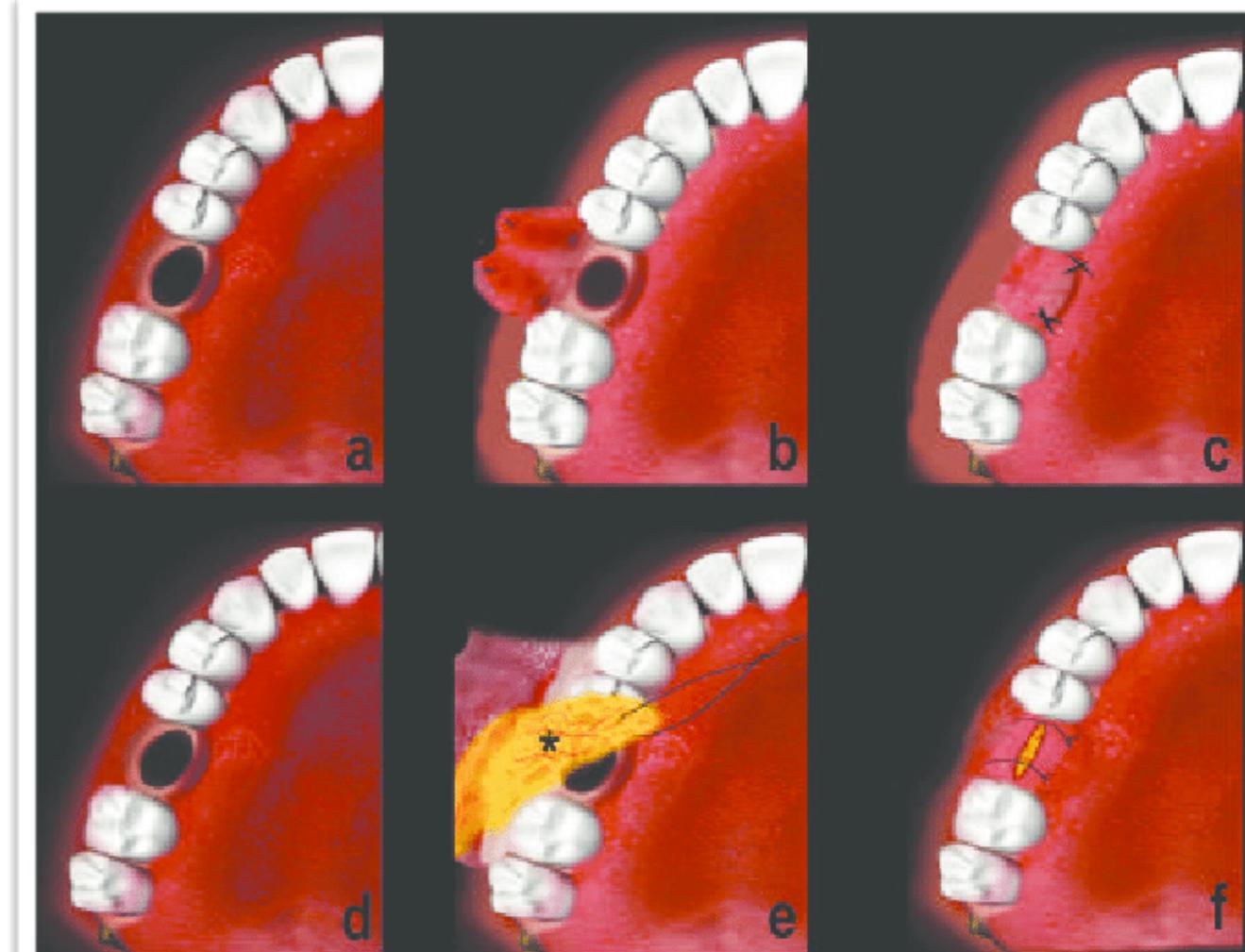
No sneezing, smoking, blowing nose, drinking through a straw, spitting.

# Complication Prevention & Management

## OA communication

### Signs of Successful Closure

1. Disease-free sinus
2. Coverage of the OAC with primary closure
3. Tension free closure
4. Patient is a non-smoker
5. Patient follows sinus precautions



# Complication Prevention & Management

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root displacement

# Complication Prevention & Management

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## root displacement

root displacement into sinus:

1. evaluate size: assess tooth removed and take xray
2. may suction and assess for removal
3. if unsuccessful, leave, refer, place on Augmentin

# Complication Prevention & Management

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## root displacement

- root displacement into sinus:



# Complication Prevention & Management

## root displacement

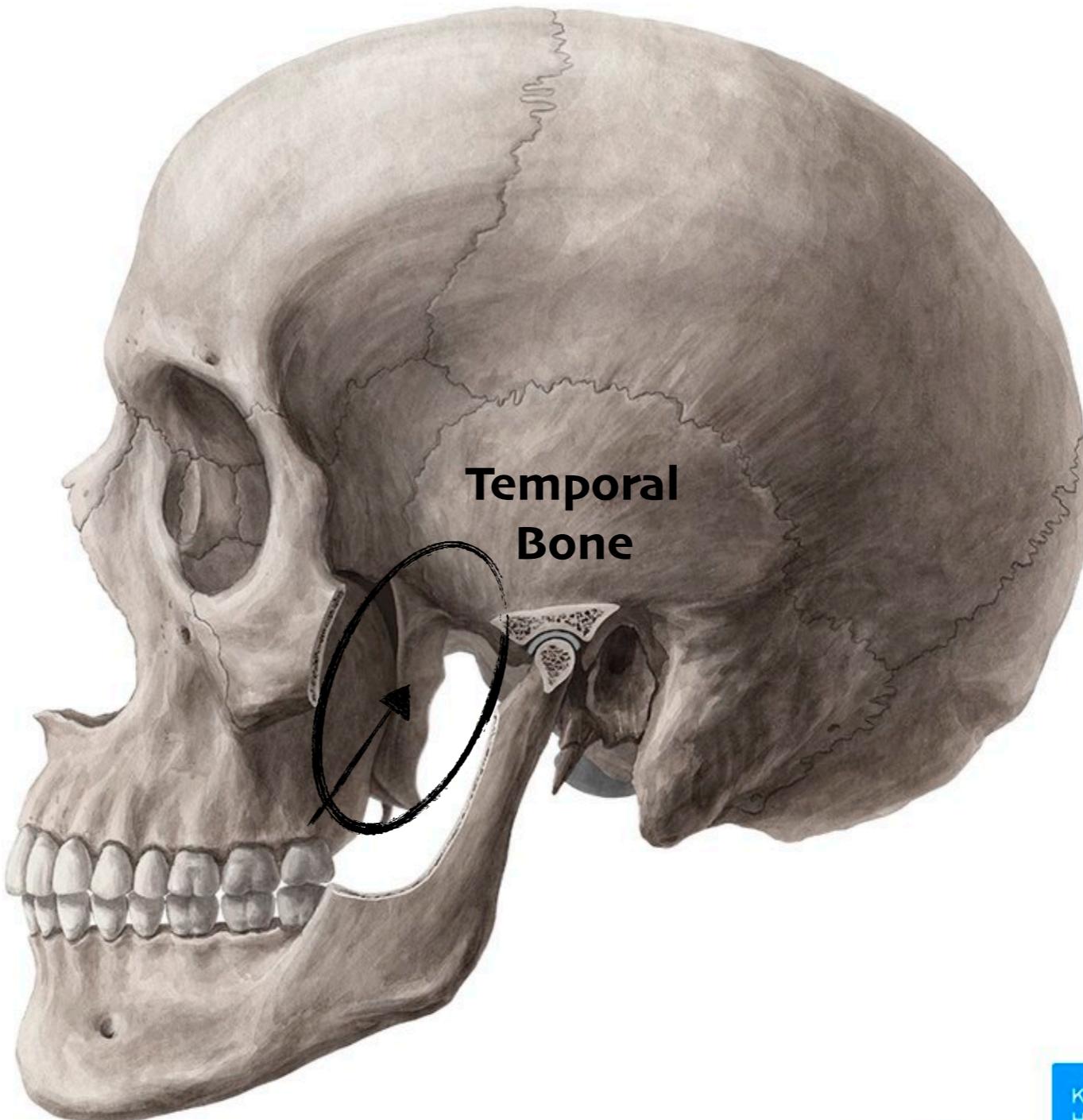
root displacement into sinus:

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maxillary wisdom tooth into sinus or infratemporal space - close and refer

# Complication Prevention & Management

root displacement



# Complication Prevention & Management

## root displacement

root displacement into sinus:

1. evaluate size: assess tooth removed and take xray
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maxillary wisdom tooth into sinus or infratemporal space - close and refer

mandibular wisdom tooth into lingual space

# Complication Prevention & Management

root displacement



- mandibular wisdom tooth into lingual space

# Complication Prevention & Management

## root displacement

root displacement into sinus:

1. evaluate size: assess tooth removed and take xray
2. may suction and assess for removal
3. if unsuccessful, leave, refer, place on Augmentin

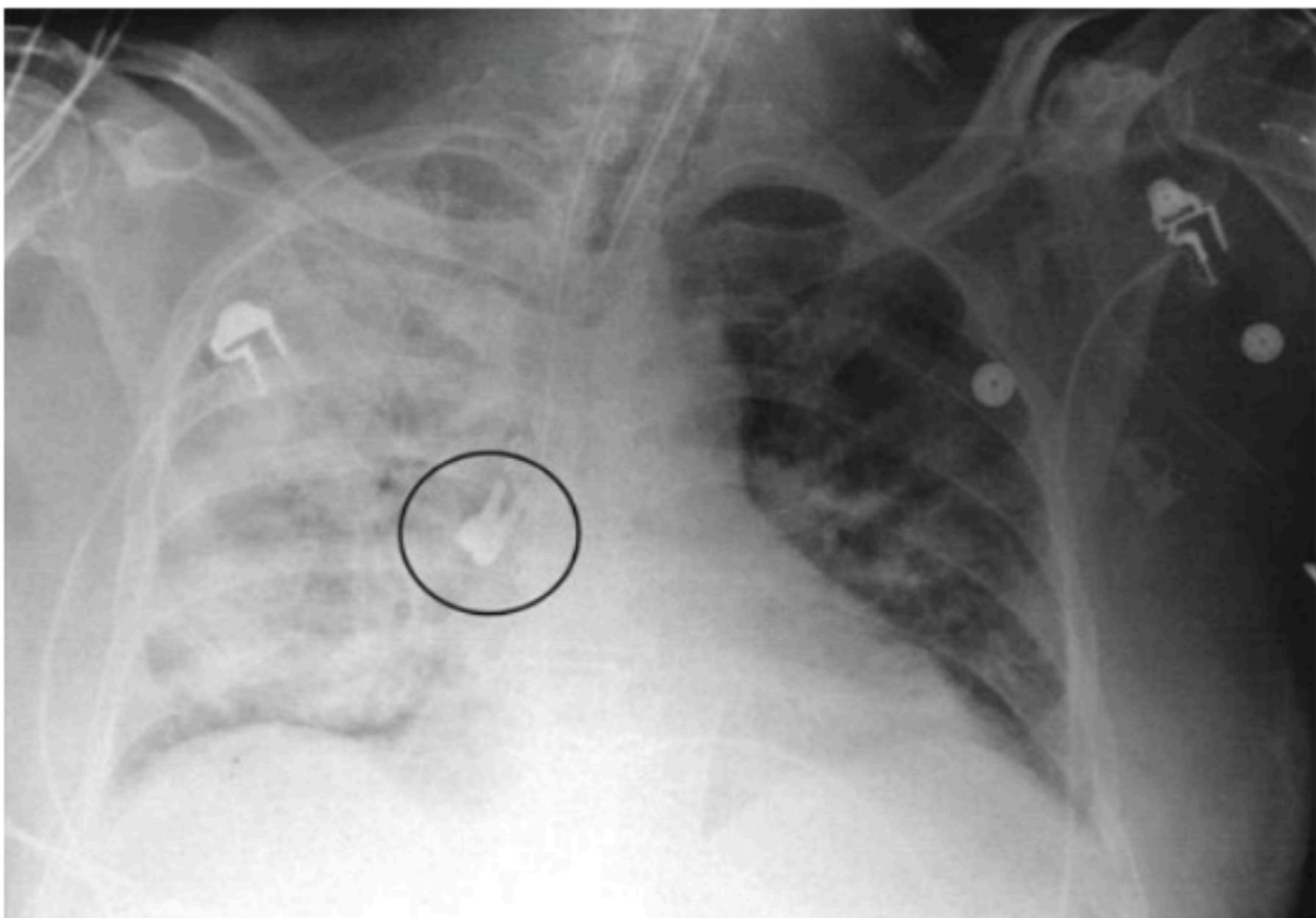
maxillary wisdom tooth into sinus or infratemporal space - close and refer

mandibular wisdom tooth into lingual space

tooth in pharynx - always send for chest xray (throat pack to prevent)

# Complication Prevention & Management

## root displacement



Infection  
aspiration  
pneumonia

tooth in pharynx - always send for chest xray (throat pack to prevent)

# Complication Prevention & Management

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leaving root tips

When?

Where?

Better to prevent

# Complication Prevention & Management

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non-healing

osteonecrosis  
osteomyelitis

Both can occur spontaneously or prior to an extraction as well.

# Complication Prevention & Management

## osteonecrosis



Figure 2

Bone dies due to poor blood supply.



# Complication Prevention & Management

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## osteonecrosis

Osteoradionecrosis - osteonecrosis due to radiation to jaw

MRONJ - medication related osteonecrosis

# Complication Prevention & Management

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## osteoradionecrosis

- Radiotherapy - consider extractions of poor prognostic teeth prior to treatment
- If patient presents after receiving radiation to head and neck - refer
- If patient presents with exposed bone in jaw, with history of radiation - refer

# Complication Prevention & Management

## MRONJ

Take home points:

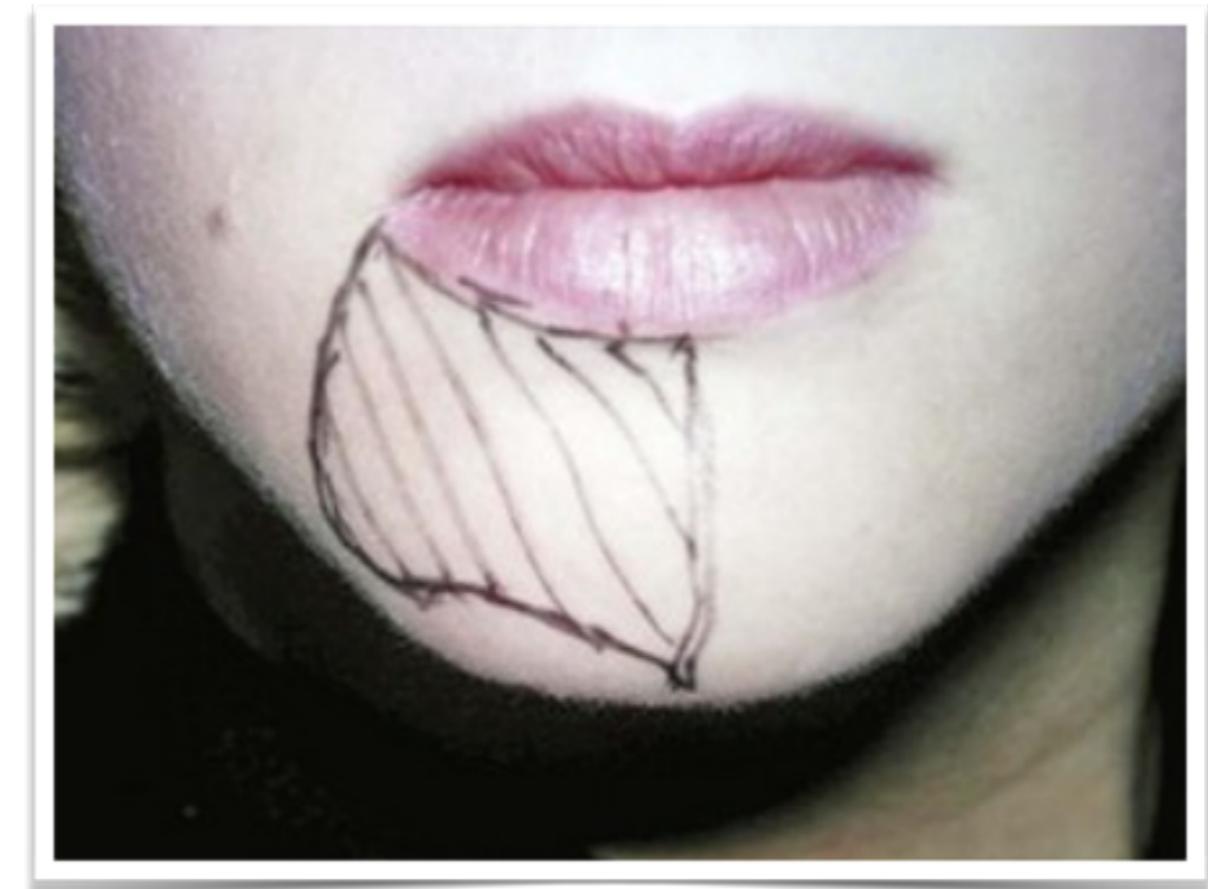
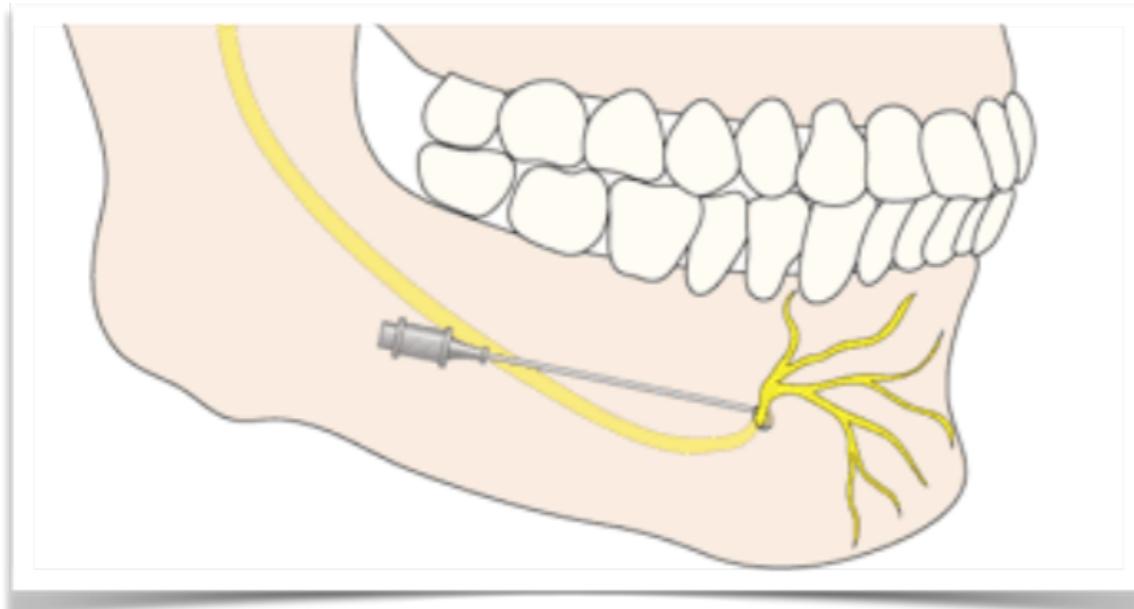
1. If you know patient has taken, is taking one of these medications refer
2. If you know patient has history of osteoporosis, bone cancer, hypercalcemia, or cancer, dive deeper before treatment
3. Highest risks of osteonecrosis are associated with bone cancer treatment
4. IV bisphosphonates can stay in your system for 7 years
5. Complete "traumatic" treatment prior to starting these medications

1. **Bisphosphonates** : osteoporosis or bone cancers
2. **Denosomab** : osteoporosis, hypercalcemia, bone cancers
3. **Antiangiogenics** : cancer fighting drugs by stopping tumors from growing blood vessels

# Complication Prevention & Management

## nerve injury

- Mental n. - know location (2nd PM in soft tissue), can cause paresthesia with swelling, returns unless incised



# Complication Prevention & Management

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## nerve injury

- Lingual n. - retromolar pad, compression injury from molar extraction, unlikely to return when gone
- Inferior Alveolar N. - either from extracting wisdom teeth in close proximity to nerve or from injection (needle) or blocking with Articaine

# Complication Prevention & Management

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## soft tissue tear

- Periosteal elevator not used thoroughly, especially in areas with perio dx and naturally more challenging areas
- Not reflecting or extending a flap when working on underlying bone

# Complication Prevention & Management

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## alveolar process fracture

- Excessive force - often fractures buccal plate (bad for future implant option)
- Risk Factors:
  - maxillary canines and molars, mandibular anteriors (thin buccal bone)
  - maxillary 1st molars, close proximity roots to sinus
    - if tooth does not budge right away - section
  - maxillary 2nd & 3rd molars - tuberosity fracture (poor denture retention)
  - age
- If alveolar process is fractured but still remains attached to periosteum and when left alone situates in original position: leave and allow bone to heal.

# Complication Prevention & Management

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## tmj injury

- Due to - excessive force
- Always use bite block to support mandible (especially with apical elevator force)
- Immediately following procedure: heat, soft diet, rest, 600 Ibu every 6 hours for a week

# Conclusions

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1. Most complications can be prevented with case selection and risk assessment.
2. Patients should have no surprises during their post-operative experience.
3. If concerned about healing or post-operative experience, refer for management
4. Don't assume ill-intent with patients or colleagues