What is an Oro-Antral Communication?

*Communication between the maxillary sinus and the oral cavity*

What is an Oro-Antral Fistula?

*If an OAC is not treated, this can become lined with epithelium. Hence, an oro-antral fistula is an epithelised tract linking the maxillary sinus to the oral cavity*

(Synonyms also include *oro-antral & oral fistulæ, sinus perforations and antra-oral fistulæ*)
Oro-Antral Communications
Photo of an Oro-Antral Fistula, created by the Removal of the UL6

Oro-Antral Fistula - Note the 'hole' is lined by epithelium (hence, fistula)
Why is an OAC a problem (1)?

When an OAC is created, this allows the flow of food, smoke or fluid from the mouth, via the maxillary sinus & into the nose.

Not just these but also bacteria, fungi & viruses. This can set up a maxillary sinusitis, which depending on how long the communication lasts for, may either yield an acute / chronic maxillary sinusitis.
Oro-Antral Communications

- Oro-Antral Communication
- Palate / Roof of Mouth
- Tongue
Why is an OAC a problem (2)?

- Patients aren’t impressed
- Not a practice builder
- Possible hospitalisation
- Possibly medico-legal action
- Removes bone that may be needed for implants (sinus repair & ‘lift’ / augmentation may be needed)
- Remove bony support for dentures (e.g. tuberosity fracture associated with OAC)
Maxillary Sinusitis (1):

- Sinusitis pain may occur in the cheek, around the eye or in the forehead
- Sometimes the pain may be felt in the upper teeth & mistaken for toothache
- Feel malaised, with a headache & perhaps a stuffy nose
- Discharge of pus into the nose is not noticed until beginning to recover
Maxillary Sinusitis (2):

Swelling of the face over the sinus sometimes occurs but is not usually marked.

Some patients have repeated infections & go on to develop chronic sinusitis.

Nasal discharge from the back of the nose down the throat may occur.

Often the condition will flare up, with acute pain.
Ætiology

Unnatural communication between the oral cavity & the maxillary sinus

Oro-Antral Communication
- Extraction of posterior maxillary teeth
- Maxillary sinus infections
- Surgical removal of cysts & benign tumours in the posterior maxilla
- Trauma
- Periodontitis

Oro-Antral Fistula
- Paget's Disease
- Iatrogenic
- Failure of closure of OAC
- Maxillary sinus infections
- Dento-Alveolar infections
- Destruction of maxillary sinus by benign tumour / cyst

Chronic / Mature Oro-Antral Fistula
- Improper treatment of OAC
- Development of chronic maxillary sinusitis as infectious complication of odontogenic pathological process
Ætiology of OAC’s (1):

- The underlying factors were exodontia (48%), tumours (18.5%), osteomyelitis (11%), Caldwell-Luc procedures (7.5%), trauma (7.5%), dentigerous cysts (3.7%) & correction of septal perforations (3.7%)

- Tooth extraction was the most common ætiological factor; malignancy should be excluded in all patients

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Oro-Antral Fistula
UR6 Region
Oro-Antral Communications

Oro-Antral Fistula
UR6 Region
Ætiology of OAC’s (2):

- Perforation occurred in 77 of all 2,038 teeth (3.8%). Of these, 38 teeth were from males (38 / 733; 5.2%), and 39 were from females (39 / 1,305; 3.0%)
- The perforation rate was significantly higher in males
- Perforation occurred most often with extraction of an upper 1<sup>st</sup> molar & in the 3<sup>rd</sup> decade of life
- The perforation rate gradually decreased with higher age

Details from the 1<sup>st</sup> Department of Oral and Maxillofacial Surgery, Tokyo Medical and Dental University 1991 - 1993.
Ætiology of OAC’s (3):

OAC’s occur with a variety of oral surgical procedures:

- Apicectomies of maxillary premolars & molars (perforations occurred in 10.4% of teeth)
- Plunging an elevator through the bony floor during root tip removal
- Forcing root tips or tooth into sinus
- Penetration while exposing impacted teeth
- Perforation during incorrect curettage
- Fracture of segment of the alveolar process containing several teeth with tearing of floor of antrum
Ætiology of OAC’s (4):

- Luxating an impacted 3rd molar into the antrum whilst attempting to remove it

- HIV-associated periodontitis complicated by necrotising stomatitis & the development of an oro-antral fistula

- Enucleating dental maxillary cysts where the partition twixt cyst & antral lining has become blurred

- Destruction of the maxillary floor by chronic apical infection
How Do You Anticipate Potential OAC Situations?

- As always, you have to carefully assess the patient. You cannot be gung-ho or complacent about it.
- You should not consider removing the tooth if you or your staff do not have the expertise / competence / equipment to resolve any untoward events that may develop.
- Refer the patient to Oral Surgeons or to the Oral Surgery Department if in doubt.
Pre-op Assessment of the Patient (1):

- *Does the tooth need to come out?*
- *Medical History & Dental History checked*
- *What does it look like on the radiograph?*
Pre-op Assessment of the Patient (2):

Medical History

- *Underlying systemic disease* (e.g. cardiovascular / metabolic / endocrine / hæmatological)
- *Presence / absence of associated disease* (e.g. cysts / neoplasia)
- *Presence / absence of other local bone / soft tissue disease* (e.g. Paget's Disease / vascular malformations / osteoradionecrosis)
Pre-op Assessment of the Patient (3):

Dental History & What does it look like on the X-ray?

- Previous history of OAC’s
- Bone quantity / quality / density (infective / condensing osteitis; isolated tooth due to extraction of adjacent teeth some years previously; bridge abutments; Pagets Disease; Osteopetrosis)
- Anatomical position (e.g. angulation / rotation leading to limited visual access)
- Previous radiotherapy
- Extent / Proximity of Antrum
Pre-op Assessment of the Patient (4):

- Associated ankylosis / hypercementosis
- Root morphology (divergent roots / curved roots)
- Status of adjacent teeth (e.g. periodontal disease / presence of restoration / function as bridge abutment)
- RCT?
- Periapical infections / Periodontal disease
- Relationship to the tuberosity
- Lone standing tooth or adjacent teeth?
- Patient co-operation / compliance
- Age of patient
As a very broad generalisation, the following may be thought to indicate an OAC-likely situation:

- **Proximity of Antrum**
- **Hyper-cementosis / Ankylosis**
- **Periapical infections / Long-standing Caries**
- **Marked Periodontitis**
- **Proximity to the Tuberosity**
- **Lone-standing / End of Arch**
- **Previous history of OAC’s**
Oro-Antral Communications
Oro-Antral Communications
What To Do Surgically?

- Warn the patient as to what to expect of the procedure & take their consent
- Use a periotome?; dilate posterior aspect of socket
- Raise a flap that can be converted into a buccal flap to close the OAC
- Remove bone from around the tooth in question
- Section the tooth
- Elevate with care
- Check the socket after exodontia
- If no OAF obvious, close as normal
- Post-op advice including no nose-blowing, advice about signs / symptoms of an OAC
How to Recognise the Acute OAC

If OAC possible, then:

- Examine tooth for adherent bone
- “Nose-blowing” test
- Determine the size of the defect
- < 2mm in diameter, no treatment required

NB The majority of OAC’s are not diagnosed as they spontaneously heal.
Suspicion of an Oro-Antral Communication

**Valsava test** results in bubbling of blood from socket
Blood trickling from nostril of affected side

**If not closed:**
Air & fluids pass between the mouth, sinus & nose
Cacogeusia & cacosmia
Unilateral nasal discharge (especially after drinking)
Sinusitis on affected side

Associated with other symptoms:
Severe pain
Epistaxis
Altered nasal resonance
Unilateral nasal obstruction

Negligible pain
Antral polyp
Hoarseness of voice
Nocturnal cough
Earache

Chronic Oro-Antral Communication / Oro-Antral Fistula

Acute Oro-Antral Communication
How to Recognise the Chronic OAC / OAF (1):

The OAC is likely to become chronic / OAF if:

- OAC is greater than 5mm in diameter
- Gingival tissues can’t be approximated
- Post-op régime is not followed
- Wound dehiscence
- Enucleation of a cyst
Oro-Antral Communications

Intra-Oral Examination of Extraction Socket

- Visible Antral Polyp
- Discontinuity of the bony floor of the Maxillary Sinus
- Irregular increase in opacity on the inner aspect of the walls owing to the mucosal thickening
  Radiolucent air shadow obvious in the central of the antral cavity following the shrinkage of the mucosal lining

- Occipitomental views / Panoramic Radiographs / CT / CBCT

- Total opacity within the affected sinus
  Sometimes the opaque zone is limited to the base of the antrum due to the initial collection of fluid

- Large Oro-Antral Fistula

- Small Oro-Antral Fistula
  - Peri-Apical / Panoramic Radiographs / CBCT
  - Disruption of Maxillary Sinus Floor
    - Valsava test
    - Cheek Blowing test
    - "Fine" hissing sound
      Blood, bubbles or mucous secretion arising from fistula
    - Hissing sound due to air leakage from maxillary sinus & nose

- Chronic Oro-Antral Fistula
- "Acute" Oro-Antral Fistula

Oro-Antral Communication / Oro-Antral Fistula
How to Recognise the Chronic OAC / OAF (2):

- May develop 4 – 6 weeks post-extraction
- Problems with smoking, eating or drinking
- Cacogeusia + cacosmia
- Chronic maxillary sinusitis
- Antral polyp herniating into oral cavity
- Purulent discharge from nose
Treatment of the Acute OAF:

- Do not probe the defect
- Promote good blood clot
- Good gingival approximation
- Hæmostatic Agent (Surgicel, Curaspon)
- Antibiotics (Amoxycillin, Vibramycin)
- Nasal decongestants (Ephedrine nasal drops, Oxymetazoline)
- Steam inhalations (Menthol & Eucalyptus)
- Antiseptic mouth-wash (Corsodyl)
- No nose-blowing or smoking
Treatment of the Chronic / Larger OAC / OAF (1):

- Assess the OAC / OAF radiographically by OM’s, OPG’s, PA’s or CBCT’s
- May still spontaneously close if cover plate used
- If OAC / OAF needs closing, pre-op antibiotic & decongestant régime (starting 3 – 7 days pre-op)
Closure of Oro-Antral Communications

- Autogenous
- Allogeneous
- Xeno Grafts
- Synthetics / Metals
- Others

Bone Grafts

Soft Tissue Flaps
- Local
  - Buccal Flap (Rehrmann & Moczair), Palatal Flap & Buccal Fat Pad
- Distant
  - Tongue Flap

Sourced from chin, zygooma, retro-molar region & iliac crest

Collagen, Gelatin Film & BioGuide / Bio-Oss

Gold, Aluminium, Tantalum, Polymethymethacrylate, Hydroxylapatite & Root Analogue

3rd Molar (Wisdom Tooth), Inter-Septal Alveolotomy, Guided Tissue Regeneration, Pro-Laminin Gel & Splint (Cover Plate)
Oro-Antral Communications

Treatment of the Chronic / Larger OAC / OAF (2):

Buccal Flaps

• **Buccal Advancement Flap** most common

• *Described by Rehrmann & made popular by Berger*
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Treatment of the Chronic / Larger OAC / OAF (3):

**Buccal Advancement Flap**

- Broad base providing good blood supply
- Periosteum scored parallel to base of flap to allow greater mobilisation of flap
- OAC / OAF mucosa excised
- Alveolus reduced in height
- Palatal mucosa incised & mobilised
- Flap brought across defect & secured with sutures
- There must be no / minimal tension on the flap.
- Disadvantage of reduction of buccal vestibular depth; reshapes in 4 - 8 weeks as flap adapts to underlying bone
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Oro-Antral Communications
Treatment of the Chronic / Larger OAC / OAF (3):

**Palatal Flaps**

- *Palatal Rotational Advancement Flap* most common
- *Others include Palatal Pedicle Island Flap* (Henderson), *V-shaped Palatal Flap* (Krueger) & *Split-thickness Palatal Flap* (Ito & Hara)
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Treatment of the Chronic / Larger OAC / OAF (4):

**Palatal Rotational Advancement Flap**

- Advantages of insured vascularity (greater palatine vessels) & thickness of tissue more like crest of ridge
- OAC / OAF mucosa excised
- Buccal mucosa incised & mobilised
- Flap brought across defect & secured with sutures
- There must be no / minimal tension on the flap
- Allows for the maintenance of the vestibular sulcus depth
- Indicated in cases of unsuccessful buccal flap closure
- Disadvantage of raw surface left behind; can be covered with a plate or Coe-pack

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Buccal Fat Pad Closure of OAC

- 55 year old male
- Exodontia of UR7 created OAC
- Complaining of stuffy R maxillary sinus, discharge from the sinus & fluid from nose after drinking
Oro-Antral Communications

Upper Right 2nd Molar (UR7) Socket / Site of Oro-Antral Communication
Treatment of the Chronic / Larger OAC / OAF (5):

Post-op Régime:

- **Antibiotics** (Amoxycillin, Vibramicin)
- **Analgesics**
- **Nasal decongestants** (Ephedrine *nasal drops*, Oxymetazoline)
- **Steam inhalations** (Menthol & Eucalyptus)
- **Antiseptic mouth-wash** (Corsodyl)
- **No nose-blowing or smoking**
- **Wearing of cover plate**
Oro-Antral Communications

Thanks
Thank you for your attention

If you do encounter an OAC / OAF, I hope this talk will help you in how you decide to treat it.