ORAL SURGERY II/ Lectures #5-8

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LECTURE#5/ PRE-PROSTHETIC SURGERY:

A-BONE CORRECTION SURGERIES

Alveolar Bone resorption rate depends on:

1- Medical History: to determine the **surgery type** and the patient's fitness for **general anesthesia.**

Uncontrolled diabetes will lead to more bone resorption.

2- Location of resorption (**Mandible resorbs faster than the Maxilla**)

**Most important things before pre-prosthetic surgery are:

1- Right Diagnosis

2- Good history taking which will make the chief complaint and the patient's expectations clear.

Cases that pre-prosthetic surgery should be done for:

I- Excess growth of tuberosity:

It's caused by overgrowth of **soft tissues** and **increase in bone size.**

Diagnosed by and X-ray and periodontal probe.

Not an option for inadequate inter-arch space.

Steps:

1- **IF THE PATIENT WANT AN IMPLANT**

Excise the soft tissues and the level of bone should be evaluated (whether it needs a bone graft or not, whether it needs sinus lifting or not).

Correct over erupted molars.

2- IF THE PATIENT WANTS A REMOVABLE PROSTHESIS:

No need for sinus lifting or bone graft only **Soft tissue excision** and **lowering the occlusal plane for over erupted teeth.**

II- Simple Alveoplasty:

Alveoplasty is to provide an adequate shape of the alveolar ridge bygetting rid of the undercuts and interferences and it is the **MOST COMMON** pre-prosthetic surgery.

Aims of this surgery:

- Remove bone irregularities (that can lead to laceration and accelerates bone resorption)

Steps:

Remove the labiocortical surface of the ridge at the time of extraction or after healing the socket.

****Using a bur or a rongeur.**

Flap type: **Full mucoperiosteal window flap.**

Suture type: **Continuous locking sutures.**

III- Knife edge ridge:

If it was presented with insufficient inter-arch space then we'll do, bone graft and augmentation

It needs **vertical incision** and **subperiosteal tunnel to insert the graft material.**

IV- intraseptal alveoplasty:

Here we remove the interseptal bone by a **rongeur or a bur** then buccal bone is compressed against the palatal bone.

SPLIT RIDGE TECHNIQUE.

It reduces the ridge width.

NO BONE RESOPTION RISK, NO ELEVATION OF A FLAP AND NO DISTURBANCE OF THE MUSCLES ATTACHMENT.

V- Bony exostosis in the tuberosity area:

If the interarch space is decreased then we remove the exostosis if the interarch space is increased then bone graft is needed.

Incision type: **Crestal and releasing incision.**

Using a rongeur or a bur.

VI- Prominent mylohyoid ridge:

Happens after severe resorption of the mandible so the mylohyoid ridge becomes prominent and it will be irritated whenever the patient wears the denture due to the lingual flanges.

VII- Torus palatinus:

Only when the patient is edentoulous, uncomfortable with it and presented in the post dam area.

Incision type: **Midline incision with releasing incisions anteriorly and posteriorly.**

Suture type: **simple interrupted sutures.**

****Subperiosteal** LA should be given.

Pieces of bone are removed with **fine osteome or a bur.**

VIII- Torus Mandibularis:

Should be removed with caution due to the presence of vital structures e.g; lingual nerve, salivary gland ducts and blood vessels.

If it was big DO NOT USE A RONGEUR because you might fracture the mandible.

Incision type: **Crestal.**

Suture type: **locked continuous suture.**

Steps:

Make a trough using a fissure bur between the tori and the lingual plate to separate it, use the osteome to lift it up and smoothen it with a bone file.

B-SOFT TISSUES CORRECTION:

I- Excess unsupported soft tissues (Flappy ridge):

Measure the tissues using a probe.

Incision type: **Elliptical incision (base is narrower than the surface)**

Healing type: Primary intention.

II- Inflammatory fibrous hyperplasia:

If its small: excision and it will close **WITHOUT** affecting the depth of the vestibule.

If its large: excision and it will reduce the depth of the vestibule so the suture is placed on the edges of the incision to supra-periosteum.

Healing type: Secondary intention.

III-Frenal attachment:

Diamond shaped incision around the frenum and remove it, if it was small.

Healing type: Primary intention.

If it was large then the incision will be sutured to the supra-periosteum.

Healing type: <u>Secondary intention.</u>

IV- Lingual Frenum:

Needs TWO ID BLOCKS.

Use the hemostat to compress the frenum for 2 minutes until blanching appears and retracts the tongue.

Incision type: **Transverse incision.**

Ligation is used in case bleeding happened to stop it.

<u>LECTURE #6/ CYSTIC LESIONS</u>

Main goals of surgical procedures for the cysts:

- Eradiction of the pathological condition.

- Functional rehabilitation of the patient.

Cyst: is an epithelial lined sac filled with fluid or soft material, appears radiolucent radiographically and it grows **SLOWLY**.

Two main types of cysts: odontogenic (**Radicular is the most common type**) and non-odontogenic.

Treatment options for cysts:

-Enucleation

-Marsupialization

- Both

- Enucleation with curettage.

I- ENUCLEATION:

Shelling out, which means the whole cyst is remove including the capsule without rupturing the cyst and without removing the surrounding structure.

If the cyst was with a non-vital tooth an Endo treatment should be held after enucleation.

<u>STEPS:</u>

1-Mucoperosteal flap (3 or 4 sided)

2- Reflect the mucosa with the periosteum (the bone should be exposed)

** **RADICULAR CYSTS** lead to bone resorption and bone expansion.

3- Reach the bone by enucleation using a curette or periosteal elevator between the cyst and the bone separating the capsule slowly and pulling the cyst out.

4- Send it to the histopathologist.

Remember in cyst cases in the mandible, even if the procedure was away from the inferior alveolar nerve the patient will have **PARESTHESIA** because of the pressure that was applied.

****AMELOBLASTOMA** cases need a safety margin (0.5-1.0 cm) causing a nerve dissection.

ADVANTAGES OF ENUCLEATION:

- Preserve the adjacent structures

- Conservative

- The whole lesion can be taken out as one piece and sent to the histopathologist

- Considered as an excisional biopsy.

DISADVANTAGES:

- Risk of fracture in cases of big lesions.

- The cyst being close to the vital structures.

II- MARSEPULIZATION:

The cyst is growing from the inside containing fluid that isn't released but it leads to its growth.

So the idea of this procedure is to create a window to evacuate the contents of the cyst and leads to shrinkage in the cyst. (**DECOMPRESSING)**

**Once it shrinks to a smaller size then either wait till it heals completely or till its small enough to do enucleation for it.

After doing this procedure we stitch the capsule of the cyst with the mucosa.

ADVANTAGES:

- Spare the vital structures from damage.

DISADVANTAGES:

- Space in the oral cavity which will lead to food impaction and contamination.

- Needs regular follow-ups, irrigation and dressings (**STEROIDS, CORTISONE AND ANTIBIOTICS**).

- Might give improper diagnosis since only part of the cyst is sent to the histopathologist.

CANINES:

**If the canine was impacted and surrounded by a dentigerous cyst of a good size on its path of eruption then marsupialization is done till it shrinks and then new bone will form and the canine will continue erupting.

**If it was an impacted canine and a dentigerous cyst then enucleation is done and the tooth is removed.

INDICATIONS:

-Assist in tooth eruption

- Proximity to a vital structure

- Reduce the cyst size to avoid mandibular fracture

- Patient is not medically fit to perform an enucleation surgery.

- Surgical access.

If the cystic fluid was **WHITE then this means its an **INFECTION.**

IF THE CYST GOT RUPTURED DURING ENUCLEATION AND DIDN'T COME OUT AS ONE PIECE THEN GO FOR MARSUPLIZATION THEN CURETTAGE.

LECTURE #7

CYSTIC LESIONS IN THE JAW:

The **MOST COMMON** cystic lesion is the **Radicular cyst (70%).**

The **2ND MOST COMMON** lesion is the **Dentigerous cyst (20%).**

The **3RD MOST COMMON** lesion is the **Keratocyst.**

The **4TH MOST COMMON** lesion is the **Nasopalatine cyst.**

Cysts in the jaw are classified according to its origin:

ODONTOGENIC: originated from the tooth germ (tissues around the tooth)

And it is divided into two types; **INFLAMMATORYAND DEVELOPMENTAL.**

NON-ODONTOGENIC: originated from the remnants of the epithelium during growth and eruption.

Such as: **FISSURAL CYST, BONE CYSTS AND SOFT TISSUES CYSTS.**

A-ODONTOGENIC CYSTS:

I- ODONTOGENIC INFLAMMATORY CYSTS:

1- Radicular cyst:

Origin: epithelial remnants of **HERTWIGS SHEATH (the cell rests of Malassez)**

Location: the apex of a non-vital tooth

Age**: 20-50 years.**

Size: **1.5-3 cm (moderate size), the size increases in time if it's left untreated.**

Radiographic features: **Round, well-defined, clear borders, unilocular and uniform radiolucency.**

Effects on the surrounding structures:

-**Displace the teeth without resorbing them.**

- **Bone expansion without perforation**

- **Displacement of the sinus wall.**

Management:

If the tooth is **restorable** then we do **RCT**.

If the tooth is **restorable** and **the root is involved** with the cyst then we do **apicoectomy** and **RCT**.

If the tooth is **mobile** and **non-restorable** then we go for **extraction.**

2- Residual Cyst:

Features are same as the Radicular cyst, but related to an **EXTRACTION SITE**.

Treatment: **ENUCLEATION.**

3-Lateral Radicular cyst:

Features are same as the Radicular cyst but it **differs** in the location, it is presented between 2 adjacent teeth (**not at the apex**) and one of them has to be non-vital.

Treatment: **RCT** and **ENUCLEATION**.

4-Lateral periodontal cyst:

A cyst presented between two adjacent teeth but both teeth are **VITAL**.

II- ODONTOGENIC DEVELOPMENTAL CYSTS:

1-Dentigerous cyst (Follicular cyst):

Location: related to the **CROWN** of an impacted tooth.

(Mainly related to the **lower wisdoms (MOST COMMON LOCATION)** followed by **upper canines** then the **lower 2nd premolars**)

Age: **20-40 years.**

Size: starts small and increases in size if left untreated since it's **ASYMPTOMATIC**.

It's diagnosed accidentally when an OPG is taken.

Radiographic features: **unilocular, well-defined, corticated and uniformly radiolucent.**

Effects on the surrounding structure:

- Bucco-lingual bone expansion.

- Displace the tooth and RARELY leads to resorption.

Names of the cyst according to the location:

CENTRAL: around the crown.

LATERAL: lateral to the crown.

CIRCUMFERENTIAL: the tooth is inside the cyst.

Treatment:

If the cyst is surrounding a 3rd molar and accessible then it's treated **ENUCLEATION.**

If the cyst is very large and not accessible then it's treated by: **ENUCLEATION AND MARSUPIALIZATION.**

If the cyst is accessible and the tooth is important then it's treated by **MARSUPIALIZATION**.

2-Eruption cyst (follicular cyst during eruption):

It’s a dentigerous cyst in the soft tissues.

Age: **Children in mixed dentition stage.**

Cause: **Trauma to the soft tissues which will induce inflammation and fluid accumulation and bluish hematoma.**

Management: if it's **PAINFUL** then topical anesthesia is give.

If it's **PREVENTING** the tooth to erupt then LA is given and a small incision is made on the soft tissues then wait for eruption.

3-Odontogenic keratocyst:

It’s still having a great debate whether it's a cyst or a tumor.

It has a **HIGH RECURRENCE RATE** and it **INVADES THE ADJACENT STRUCTURES.**

The associated teeth are **VITAL.**

Site: **Posterior body of the mandible (MOST COMMONT)** and the **ANTERIOR MAXILLA** in the canine region.

Radiographic features: **multilocular but may be unilocular, Radiodense and uniformly radiolucent.**

Effects on the surrounding structure:

- **RARELY** bone resorption.

- **DISPLACEMENT** of the teeth.

- Grows **ANTERIOR-POSTERIOR** direction inside the **cancellous bone.**

Management: **ENUCLEATION** with curettage using **CARNOY'S SOLUTION.**

CARNOY'S SOLUTION: it is a mixture of chemicals one of these chemicals is **FORMALDEHYDE (**might lead to irritation and trauma to the soft tissues, it's also carcinogenic that’s why it can't be applied to the cysts close to the vital structures) **new generations of this solution are available without formaldehyde.**

Multiple keratocysts are related to GORLIN SYNDROME (nevoid basal cell carcinoma syndrome) it has the following features:

- Multiple odontogenic keratocysts in upper and lower jaws.

- Multiple Basal cell carcinoma in the skin.

- Skeletal anomalies e.g; **BIFID RIBS**, **CALCIFICATION OF THE FLAX CEREBRI** (separation between two lobes of the brain).

Treatment: treat each keratocyst **INDIVIDUALLY.**

4-Developmental Lateral Periodontal Cyst:

Age: **Variable.**

Frequency: **Uncommon.**

Teeth are **VITAL.**

Management: Enucleation.

5-Glandular Odontogenic cyst:

Site: **Anterior area of the mandible and it CROSSES the midline.**

MULTILOCULAR.

It may cause **PARESTHESIA** if it's close to the mental nerve and it is very **AGGRESSIVE** and it may recur.

B-NON-ODONTOGENIC CYSTS:

I- Developmental Cysts:

- Nasopalatine duct cyst

- Nasolabial cyst.

- Median palatine cyst

- Globulo-maxillary cyst.

- Median Mandibular cyst.

1-Nasopalatine duct cyst: **MOST COMMON**

Origin: the duct of **nasopalatine canal.**

Age: **40-60 years.**

Size: **6mm to several cms.**

Shape: **Round, unilocular, well-corticated, HEART SHAPE.**

Effect on the surrounding structures: **Distal displacement of the teeth only.**

Management: **Enucleation.**

2- Globulo-Maxillary Cyst:

Location: **Anterior maxilla** (between the canine and the lateral incisor).

It's only a clinical term to describe the site of the cyst it's **NOT** a true developmental cyst.

3- Nasolabial Cyst:

They are rare cyst that occurs in the soft tissues at the **LATERAL BORDER OF THE NOSE** and appear as a swelling with **NO RADIOGRAPHIC FEATURES.**

II- BONE CYSTS:

1-Solitary bone cysts:

Unknown aetiology may be related to a **TRAUMA.**

Site: **premolar and molar region of the mandible.**

Shape: **Monolocular.**

Treatment: **Aspiration.**

2-Aneurysmal Bone cyst:

(Localized non-neoplastic proliferative lesion of the **vascular tissues** containing **giant cells**)

Age: less than 20 years.

Site: **Body of the mandible.**

Shape: **Monolocular or multilocular, SOAP-BUBBLE APPEARNCE (**HONEY APPEARANCE)

Treatment: Aspiration.

3- Stafne's cyst:

(Lingual salivary gland inclusion defect)

Shape: **Well-defined depression in the lingual surface of the posterior body of the mandible (below IAN).**

It's asymptomatic.

Treatment: **NO NEED JUST FOLLOW UP.**

III- SOFT TISSUES CYSTS:

1- Dermoid:

It is a cystic **TERATOMA** derived from **EMBRYONIC GERMINAL EPITHELIUM.**

Location: **BELOW THE FLOOR OF THE MOUTH.**

DDX: Rannula.

2- Branchial Cyst:

Origin: **remnants of branchial artery**.

Location: **Anterior border of the STERNOCLEIDOMASTOID muscle.**

3-Thyroglossal duct cyst:

Origin: **remnants of the thyroid gland.**

Location: **Midline of the neck** (presented as a lump) in the region of the **HYOID BONE**.

It is usually **PAINLESS.**

The mass on the neck moves during swallowing and during tongue protrusion due to its attachment to the tongue via the tract of thyroid descent.

Treatment: **SISTRUNK PROCEDURE** which is a surgical resection of the duct to the base of the trunk and removal of the central portion of hyoid bone.

This procedure involves:

- Cyst excision

- Excision of the path's tract and branches.

- Removal of the central portion of the hyoid bone.

Thyroid scans and functions are ordered **PRE-OPERATIVELY.**

4- Salivary glands cysts:

This is a mucous cyst that is also known as **MUCOCELE,** it is a fluid filled swelling that occurs on the lips or the mouth.

The cyst develops when the salivary glands become **PLUGGED** with mucous.

Site: **Lower lips (MOST COMMONLY)**

Cause: **Trauma.**

They're usually temporary and painless.

LECTURE 8/ PRINCIPLES OF BIOPSY

Biopsy: is the removal of a tissue from a **LIVING** individual for diagnostic purpose and it should be carried when definitive diagnosis cannot be performed using less invasive modalities.

Biopsy has four major types:

- Cytology (smear and brush)

- Aspiration biopsy.

- Incisional biopsy.

-Excisional biopsy.

I-CYTOLOGY:

Cytology is mainly used in gynecology (**PAP SMEAR for the cervix**)

In the oral cavity it is done by taking a **SCRAP OF CELLS** especially from the **buccal mucosa** or the **tongue.**

It is considered an **ADJUNCT METHOD** and it doesn't substitute taking a biopsy because it's unreliable and has many **FALSE** results.

Indications:

When the oral cavity is having a large mucosal changes and must be monitored for **dysplastic changes**.

Technique: the lesion is scrapped repeatedly firmly with **moistened tongue depressor** in order not to hurt the mucosa, then the cells are smeared on a glass slide then it's fixed and stained to be seen under the microscope.

The brush is more invasive than the smear biopsy.

II- ASPIRATION:

This is a very important biopsy and it's made with a needle (**GAUGE 18**) and a syringe (**5-10ml**) to penetrate the lesion finely.

It cannot be used with a solid/firm lesion the needle won't penetrate.

After aspiration we might see different kinds of fluids:

If it's **STRAW-COLORED** then it indicates a **CYSTIC LESION.**

If contains **PUS** then this is an **INFECTIOUS PROCESS.**

If it contains blood this is ALARMING and might indicate a **BONE CYST** such as Aneurysmal bone cyst, central giant cell lesion or vascular malformation (**DANGEROUS**).

Vascular malformation is dangerous because it might lead to perfuse bleeding especially if its main feeder is like the **EXTERNAL CAROTID.**

NEVER EXCISE A LESION WITHOUT ASPIRATION ESPECIALLY IN VASCULAR LESIONS.

Vascular malformation features are seen with special techniques such as **ANGIOGRAPHY** to visualize the vessels by injecting a **RADIO-OPAQUE** contrast agent into the blood vessels and imaging using X-rays to identify the feeder of the lesion.

Aspiration for a bony cyst could be performed by making a flap and drill a hole in the bone to allow the needle to be introduced into the lesion.

Technique:

-Local anesthesia but if the lesion is **SUPERFICIAL** then there is no need for LA.

-Introduce the needle into the core of the mass and aspirate.

- Send the aspirated fluid to the lab

FINE NEEDLE ASPIRATION:

This technique uses a 20-21 gauge needle and it's different from the one we use for the oral cavity and it's designed to go deeper in tissues and it's guided by **ULTRASOUND** usually done by interventional radiologist.

Indications:

Fluid filled cyst not necessarily in the oral cavity it may be in the maxillofacial area or in the neck, such as: ;lymph nodes lesions, thyroid gland lesions and salivary gland lesions.

We don't use this technique in the oral cavity.

III- INCISIONAL BIOPSY:

This type of biopsy only represents a particular part of the lesion that’s why when the lesion is large we have to take multiple incisional biopsy from different areas.

Indications:

- The lesion is difficult to excise.

- The lesion is presented in a hazardous location.

- When the lesion is suspected to be malignant.

Principles:

It should be biopsied in **WEDGE FASHION**, the material should be taken from the edge of the lesion to include some normal tissues.

IT'S BETTER TO TAKE A DEEP NARROW BIOPSY THAN A BROAD SHALLOW ONE.

IV- EXCISIONAL BIOPSY:

It implies the removal of the entire lesion at the time of surgical diagnostic procedure so it's **DIAGNOSTIC AND THERAPEUTIC.**

Indications:

- Small lesion (**LESS THAN 1 CM)**

- The lesion appears benign.

Technique:

The entire lesion along with 2-3mm of normal appearing surrounding tissue is excised and placed in **10% FORMALDEHYDE** and send it to the lab.

Follow up: **After one week to see the surgical site healing and to inform the patient with the biopsy results.**

ANY BIOPSY NEEDS THIS PROCEDURE:

Anesthesia:

Ring anesthesia around the lesion, the lesion should not be injected with LA because it will distort the specimen.

If it is not applicable then we do LA infiltration but the solution should be at least 1 cm away from the lesion.

Tissue stabilization:

Lips should be immobilized by the **assistant's FINGERS** pinching on the lips on both sides of the biopsy.

Also these can be used; **HEAVY RETRACTION SUTURES** and **TOWEL CLIPS** (to immobilize the tongue or soft palate).

Hemostasis:

It's important to prevent the formation of a hematoma or infection.

SUCTION DEVICE for aspiration of surgical hemorrhage should be AVOIDED so a gauze should be wrapped around the tip of the low volume suction.

Sutures should be everted.

Incisions are made by **#11** and **#15** scalpels.

Ellipse (V-shaped) narrow and deep incision is easy to close and should be PARALLEL to the nerves, arteries and veins to reduce their damage.

Elliptic incisions on the **ATTACHED GINGIVA** and the **PALATE** heal by **SECONDARY INTENTION.**

Electro-surgical instruments are **contraindicated** because they lead to:

Tissue destruction and **distortion of the specimen.**