Management of non-odontogenic tumors

Classification: benign (less aggressive)

Malignant (more aggressive)

Clinical picture even benign tumors can b very aggressive

Benign lesions (non aggressive lesions) means that the clinical behavior of this lesion is not aggressive, now it might be aggressive locally, but generally it's benign tumor.

less aggressive : cystic lesions, characterized by radiolucency, never radio opaque or even mixed radiopacity, well defined margins (corticated)

The same features can be found in other benign lesions with more defined cortication indicating the chronic profile of the cyst.

Benign tumors or even malignant ones don't show any signs or symptoms until later stages or if they got super infected

So benign or malignant tumors are detected or discovered by the appearance of signs and symptoms in the later stages or if they get super-infected earlier or by chance

Radiographic features

1. Well demarcation or cortication is characteristic of benign tumors.
2. Root resorption is a feature of benign tumors.
3. displacement (whether mild or severe): benign feature, non cystic
4. Clinical picture: benign tumors do respect the neurovascular bundle, it may push them (displace them) but never penetrates them. So when a

parasthesia (neuro) or a non-healing ulcer (vascular) is detected, malignancy here is more probable than a benign tumor.
These signs are considered very important to check when dealing with any tumor clinically.

Benign and malignant tumors have different clinical presentation; that's why it's worth it to talk about general guidelines or principles to get to a unified treatment plan for each presentation of any of these tumors. According to the classification, the treatment plan is set for the best management to be taken.

Two main different techniques can be used in the excision of any tumor:
Enucleation or dissection

Enucleation: general surgical technique refers to the surgical removal of a mass without cutting into or dissecting it, so there's direct contact of the surgical instrument with the wall of the lesion. Enucleation could be with or without curettage depending on the size and aggressiveness of the lesion. Enucleation is the first option for any cystic lesion, also for some benign tumors like Ameloblastoma.

Dissection: applied to the tissues or the bone surrounding the lesion. No direct instrumentation with the wall of the lesion. Dissection can be marginal, partial, total or composite; also depending on the aggressiveness of the tumor

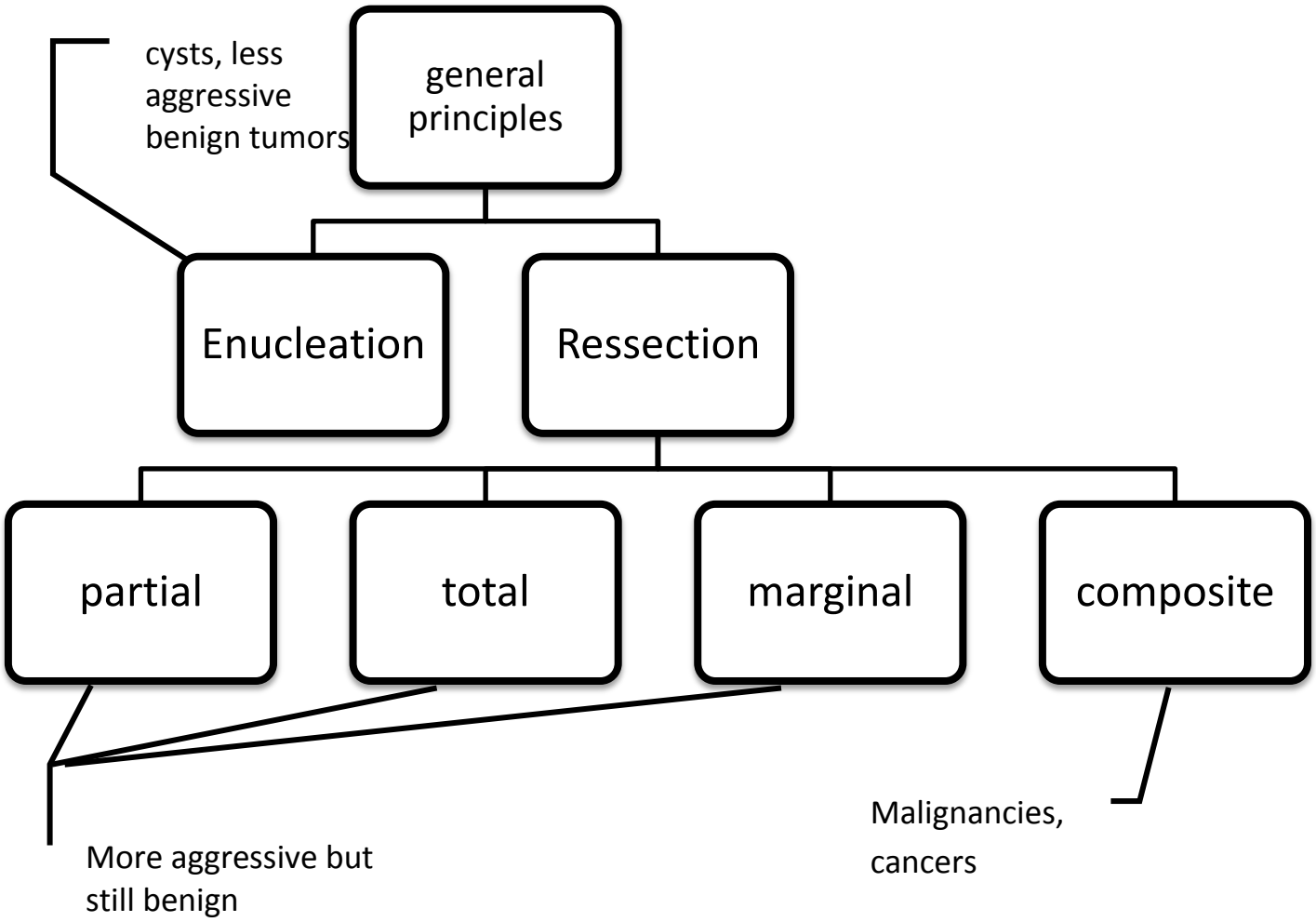
Marginal resection: excising the lesion preserving the continuity of the bone (be careful! in the book it's referred to as segmental resection, but it's not. segmental resection is the partial resection not the marginal)

Marginal = preserves the margin (the continuity of bone)

Segmental = partial not marginal (no preservation of the bone margin) ex. removing a whole part of the mandible. Hemimandiblectomy => cutting out

half of the mandible. Even when removing the whole mandible and preserving a tiny part like the condyle, it's still called partial resection. So, total resection indicates removing the whole mandible (not the whole lesion) without leaving any bone behind.

Composite resection: used only for malignant tumors, removing all different types of tissues from the same area (Bone, muscles, epithelium, lymph nodes,etc) that's why it's applicable foe cancers, when we have to remove everything around the lesion whether it's soft or hard tissues



*__aggressiveness of the lesion__ is the most important factor in planning the treatment.

99% of the time it's determined by looking at the histopathological features

But sometimes the clinical presentation is more important. Ex. Giant cell lesions, it has 4 types they all look the same on histopathological samples, the only way to distinguish between them is by the clinical presentation [Aneurysmal bone cyst, cherbusm, giant cell tumor, hyperparathyroidism]

***Anatomic location of the lesion:**

-Maxilla vs. mandible

- Intra-osseous vs. extra osseous

-Anterior vs. posterior.

Anterior vs. posterior: the difference is in the accessibility and so the resectability. Being an anterior lesion makes a tumor easily accessed and resected, but if the very same lesion was located in the posterior area (ex. nasopharynx) it would be very hard to approach and excise accordingly the treatment will be only palliative, meaning to reduce the size of the tumor to facilitate breathing.

Size of the tumor is very significant in determining the type of treatment.

reconstructive point of view: sometimes the lesion is huge and removing it as a whole would jeopardize future reconstruction (ex. leaving the condile in a mandible affected all over by a tumor, to alleviate future reconstruction) because surgical treatment plans of tumors is not only getting rid of them or their symptoms, what happens to the patient after the surgery has to be

taken into consideration too. They can't be left without a mandible!! That's why planning reconstruction before the excision surgery is vital as well.

size of the lesion: it gets more significant when it becomes closer to vital structures, furthermore, when getting too big in size that it affects function after excision if planned, hence planning reconstruction. Benign cystic lesion occupying small area or not the full thickness of the mandible, the treatment will be Enucleation, but if the cyst is occupying the full thickness of the mandible, the treatment may become partial resection.

Maxilla vs. mandible: Any lesion is more dangerous in the maxilla than in the mandible. The reason behind that is the low density of cancellous bone in the maxilla compared to compact bone in the mandible hence less resistance against expansion of the lesion. The presence of maxillary sinuses makes almost no resistance against tumor growth and even it happens asymptomatically, with symptoms occurring late. Lesions in the Maxilla are usually discovered in later stages (advanced stages).

Intra-osseous and extra-osseous location: If the tumor is extending out of the bone and perforates the cortex, this indicates aggressiveness of the lesion and should be treated more aggressively.

Lesions treated with Enucleation, curettage or both: ROUGHLY, odontoma, cystic lesions, ameloblastic fibroma and other very benign non aggressive lesions like keratinizing and calcifying odontogenic cysts, adenomatoid odontogenic tumors and cementoblastomas. What's common between all these lesions is the low recurrence rate.

Lesions treated by marginal or partial resection are generally Aggressive benign tumors like: the ameloblastoma, the odontogenic myxoma, the

calcifying epithelial odontogenic tumor, the squamous odontogenic tumor, and the ameloblastic odontoma.

We go for partial or marginal resection after a lesion has been confirmed by histopathology or by clinical exam to be *aggressive.* And that's when its consistency makes it difficult to be removed by enucleation or curettage.

Malignant tumors are treated by composite resection.

Other factors should be also considered in the treatment plan like: the *age, size and location of the lesion, proximity to neurovascular bundles and reconstruction.*

The following part of the lecture is a discussion of **clinical cases**, unfortunately we don't have any photographs so you have to use your imagination!

**** Case #1:**

Panoramic radiograph, well defined corticated uniform radiolucency in the mandible related to the apex of the lower 7, limited in size. Doesn't occupy the full thickness of the mandible, *mostly it is radicular cyst*.

The treatment in this case is enucleation.

They lesion is near the neurovascular bundle, we can do retraction to the neurovascular bundle and do enucleation but this might lead to post-operative parasthesia or anesthesia.

- NOTE that if the lesion is too large, and occupying the full thickness of the mandible, the treatment will become partial resection and would need a reconstructive plate.

-IF the type of cyst was *keratocyst*, curettage is needed, hence high recurrence rate.

**** Case #2:**

A 53 year-old hypertensive female. There is a well-defined corticated uniform radiolucency related to the apex of her tooth. There are no signs of malignancy.

The continuity of the bone could be preserved, so the treatment plan is Enucleation with or without curettage.

**** Case #3:**

A 75 year-old male. On CBCT scan, a huge dentigerous cyst in the mandible was found. ID nerve is very close to the wisdom tooth (involved in this lesion).

The patient had a complicated medical history “cardiovascular problems”. When the cardiologist was consulted, he implied that this patient is a moderate-risk patient.

So, the doctor did it under local anesthesia but with monitoring of blood pressure.

-Limited neurovascular sensory dysfunction happened because the ID was very close.

Note that although it was asymptomatic, it was still a lesion that can be still growing, getting closer to vital structures so it had to be removed.

Remember: For medically complicated patients or patients with cardiovascular problems, the fitness for surgery and anesthesia (GA) is classified into:

-Low risk patient, the incidence of having complications as a result of GA like MI or stroke doesn't exceed 5%.

-Moderate risk patient, incidence of complications is 15-20%

-High risk patient, incidence may reach 50%.

**** Case #4:**

Male patient has a well-defined corticated lesion related to the apex of his tooth that had to be excised by enucleation without curettage.

**** Case #5:**

A 52 year-old male patient, heavy smoker. Has a lump in his lower lip over the last 6 months.

- **First step**: Taking the history and assess the risk factors "like smoking" and do proper full examination to the oral cavity. A mobile palpable bilateral mandibular lymph nodes were found. "When they are mobile, it is a positive indicator because it might be infection".

The size of the tumor was about 4cm.

- **Second step**: Taking biopsy. 2 biopsies were taken, each one included parts of normal and abnormal tissues to compare between them. The result was well differentiated Squamous Cell Carcinoma.

- staging the Cancer (identifying the stage that it has reached)

- The histopathology shows the aggressiveness of the lesion.

- Checking whether the neck is involved or not (if they're involved it has to be stage three or above), to know the stage and verify the treatment plan.

Of course, treatment of stages 1&2 is different than stages 3&4.

As mentioned, many other factors than histopathology may affect the aggressiveness and the treatment of the lesion.

- CT with contrast is the radiograph of choice because the nose shows clearly on it, but the patient wasn't fit for CT with contrast because he has kidney problems "High Creatinine and Potassium levels".

- The patient was admitted to hospital to correct the Creatinine and kidney function, but even after that he was still not fit for CT with contrast. So, CT without contrast was taken.

- Fortunately, the report was negative, No nick lymph nodes involvement.

- Now we can determine the stage which is >> T2M0N0, Stage 2

T2 >> the tumor was 2-4 cm

M0, N0: No neck metastasis, that is to say no distal metastasis.

-After knowing the stage, when we go to any guideline we find that the treatment of stage 2 is surgical excision without any radio/chemo-therapy. But we have to excise 5-10mm around the lesion as a safety margin.

** IF the same lesion “stage 2” is located in the posterior lateral part of the tongue or the floor of the mouth, the treatment would brutally differ.

These are called (high risky sites). Even if we have stage 1 tumor without lymph node involvement, we have to do elective or prophylactic neck dissection because in 30% of the cases there would be focal metastasis which doesn’t appear in CT scans. So the location affects the treatment.

** When we excised 1 cm around the lesion, most of the lip tissues were excised and reconstruction is necessary.

So, size of the lesion and the reconstructive factor will affect my treatment plan and the flap selection.

** Then we sent a frozen section to the lab, and fortunately the result was negative and the margins were clear.

** We removed the lip and preserved just the commissural area & did what we call: Zigzag flap which is indicated in lesions occupying at least 2/3 of the full length of the lower lip. Releasing incisions were also done to close the flap.

If the lesion occupies just one third of the lip, other types of flaps are indicated like: Abbe flap.

What we have to know is that the size of the lesion affects the type of the flap.

Notice that many factors are affecting every step in the management.

** The only problem that may happen to this patient after the flap closure is microstomia.

Splints should be made for him and after 6 months. commissuroplasty should be done too to achieve adequate mouth opening.

**** Case #6:**

There is swelling affecting the anterior part of the mandible. The clinical features show us displacement of the teeth. This is a feature of benign tumors. There is expansion in the bone.

OPG is not useful in these cases. CT scan was taken and multilocular lesion with buccal cortex perforation were seen. So, the tumor is infiltrating the soft tissue which had to be involved in the excision “some parts of the gingiva had to be taken too”. So the type of treatment is affected.

-As we said, extraosseous lesions are more dangerous than intraosseous lesions.

But in this case it is with a limited size and the inferior border is intact.

-After taking the biopsy we found that it was an ameloblastoma. The treatment is marginal resection “because the lower border is intact”.

Then reconstruction should be done. Could be immediate or delayed.

The most important factor in the immediate reconstruction is to have availability of soft tissues.

In this case we removed the soft tissue, so the reconstruction had to be delayed. But if we didn't remove the gingiva, we could have done immediate reconstruction.

**** Case #7:**

There is a lesion occupying the posterior part of the mandible. The first thing we should do is taking a biopsy.

We found perforation in the buccal cortex when we took CT, which is an indicator of soft tissue involvement. The treatment was partial resection "No continuity of the bone in this case, the size affects the treatment".

Of course reconstruction is needed. The condyle is preserved to be able to put screws for reconstruction.

(In reconstruction, we should have an area that receives at least 3 screws).

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