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Hand Out

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Sheet

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The principles of surgical management of non-odontogenic tumors.

-In general, lesions affecting the jaws are classified into odontogenic and non-odontogenic tumors.

-In the current classification of WHO 2005, some lesions are *added to* *the tumors*: like keratocystic odontogenic tumors (the para-keratenized type).

* In the current classification, ***non-odontogenic tumors*** are classified into benign and malignant (These are pure non-odontogenic tumors) :

*Benign* tumors like osteoma, Chondroma & Fibroma.

*Malignant* tumors like osteosarcoma & fibrosarcoma.

* Langerhans cell diseases “Histocytosis” are considered as separate entity of this classification.
* Lesions containing multinucleated Giant cells “Giant cell lesions” >> were classified under the head of Bone related lesions. These giant cell lesions are:

1-Central giant cell granuloma

2-Hyperparathyroidism

3-Cherubism

4-Aneurysmal bone cyst

\*\*These types of tumors *usually* affect the long bones not the jaws.

* Reticulum cell Sarcoma, lymphoma, multiple myeloma >> were classified as lymphoreticular tumors. “I’m not sure about them”
* In general, there are three main types of lesions “or tumors or lumps” affecting the jaws. Each type has its own behavior and its own clinical, radiographical and histopathological features. These types are :

1- Very benign non aggressive lesions: like Cystic lesions. Most of them are well defined corticated lesions. Clinically, they are asymptomatic until they are super infected.

2- Aggressive but benign lesions: like benign tumors. They are more aggressive than cystic lesions and affect the surrounding structures more than the cystic lesions; they might displace the surrounding structures like teeth.

*Slight* resorption of teeth *may happen* because they are slowly growing lesions.

3- Malignant aggressive tumors: ill- defined, hazy outline, very aggressive and destruct the surrounding structures. They don’t respect the neurovascular bundles.

* The management according to the lesion we are dealing with, will be:

1- For very benign non aggressive lesions, the treatment is mainly enucleation +/- curettage.

**Enucleation**: The instrument will be at close and direct contact with the lesion while excising it out of the surrounding bone. It is indicated MAINLY for very benign non aggressive lesions.

2- For aggressive lesions we have to remove the lesion with safety margins, which means that my instrument is not in direct contact with the lesion. We excise the lesion with excising part of the surrounding tissue “safety margin” . This is called resection.

**Resection** : Removing the lesion with part of the surrounding tissue “safety margin”.

-If the resection preserves the continuity of the bone (after we remove the lesion with the safety margin, the continuity of the bone is still preserved), it is called *marginal resection*.

-If the resection removes part or segment of the bone “to the midline” and didn’t preserve the continuity of the bone, it is called *partial resection*.

( Even if we remove from the symphysis area to the condyle “hemi-mandibulectomy”, It is also called partial resection because it is just to the midline).

-If the whole mandible is removed, this is called mandibulectomy or *total resection*.

So,

* For very benign non aggressive lesions “Cystic lesions” >> Enucleation and/or curettage.
* For benign tumors “aggressive or non-aggressive” >> Resection: marginal, partial or total.
* For malignant or very aggressive tumors >> *Composite resection*: which means we have to remove everything related to the tumor; hard or soft tissue especially lymph nodes and neurovascular bundles.
* The factors that determine the treatment plan to these lesions are :

1- The histopathology:

The most important factor in determining the type of treatment is the histopathology “as we said above” which shows us the behavior, aggressiveness and prognosis of the lesion. So first we have to take biopsy to know if the lesion is benign, malignant or cyst.

It is the most important factor; however it is not the only factor.

2- The location of the lesion:

Any lesion affecting the maxilla is usually more aggressive than mandibular lesions, because the maxilla has more spaces like the sines, the nasal cavity, the cancellous bone, so it will not have the same resistance as the dense mandibular bone. Of course this will influence my treatment plan by increasing the safety margin in the resection.

 (So the marginal resection may become partial resection when we increase the safety margin in the maxilla).

-If a patient has ameloblastoma in his upper jaw, and other patient has ameloblastoma in his lower jaw, the first lesion would be more aggressive than the second one.

3- If it is adjacent to vital structures and neurovascular bundles:

This might also affect the treatment plan. To preserve the neurovascular bundles and prevent any neurosensory problem, we might accept some compromise.

The best example is the condyle, which is an important anatomical structure. Sometimes we may leave a part of the tumor in the condyle in order to facilitate the reconstruction.

4- Size of the tumor .

 -As we said, if there is very 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.

5- 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.

6- Reconstruction:

We have to take the reconstruction into consideration when putting the treatment plan .

\*\*As a summery,

The main factor that influences my treatment plan and the selection of the proper type of excision of these tumors is the histopathology of the lesion, which can guide us to the aggressiveness of the lesion and the treatment.

IN GENERAL :

 ROUGHLY, odontoma , cystic lesions, ameloblastic fibroma and other very benign non aggressive lesions treated in general by enucleation and/or curettage.

Aggressive benign tumors treated by marginal or partial resection.

Malignant tumors 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.

\*\* If we are asked in VIVA exam about the treatment, we should answer in a systemic way by mentioning: taking the history, the examination, taking biopsy , clinical findings , …

The doctor showed us many cases to see how the previous factors can affect the treatment plan :

\*\* 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 occupying 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 paresthesia or anesthesia.

NOTE that

 - IF the lesion is large and occupying the full thickness of the mandible the treatment will become partial resection and needs reconstructive plate.

-IF the cyst was keratocyst, curettage is needed.

\*\* Case #2:

53 years old female patient. There is a well-defined corticated uniform radiolucency related to the apex of her tooth. No any sign of malignancy.

She has hypertension.

The continuity of the bone could be preserved, so the treatment plan >> Enucleation and/or curettage.

\*\* Case #3:

75 years old male patient. When taking CBCT scan, we found that he has huge dentigerous cyst in the mandible. ID is very close to the wisdom tooth involved in this lesion.

He has very complicated medical history “cardiovascular problems”. When the cardiologist was consulted, he told us that this patient is moderate risk patient.

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

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

NOTE that although if it is asymptomatic, it is a lesion so it should be removed.

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

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

-Moderate risk patient, the percentage of the complications is 15-20%

-High risk patient, the percentage may reach 50%.

\*\* Case #4:

Male patient has a well-defined corticated lesion related to the apex of his tooth. Should be removed by enucleation and/or curettage.

\*\* Case #5:

52 years 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 and full examination to the oral cavity. We found mobile palpable bilateral mandibular lymph nodes “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. We took 2 biopsies, each one included part of the normal and abnormal tissues to compare between them. The result was well differentiated Squamous cell carcinoma.

- Determining the cancer’s stage by many factors.

- The histopathology shows us the aggressiveness of the lesion.

- Checking whether the neck is involved or not to know the stage and put the treatment plan.

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

(As we said, many other factors than the histopathology affecting the aggressiveness of the lesion and the treatment.)

* CT with contrast is the radiograph of choice because it shows us the nose in a good way, 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 he still not fit to CT with contrast. So, CT without contrast was done.

- 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 from 2-4 cm

M0 , No >> No neck metastasis so 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 5mm-1cm 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 be different.

These are called (high risky sites). Even if we have stage 1tumors without nodes involvement in these sites, we have to do elective or prophylactic neck dissection because

in 30% of these cases there would be focal metastasis which doesn’t appear in the CT scan. *So the location affects the treatment.*

\*\* When we excised 1 cm around the lesion, I found that most of the lip is 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 frozen section to the lab, and fortunately the result was negative and the margins were clear.

\*\* We removed the lip and preserved just the commercial area & did what we call: Zigzag flap which is indicated in those lesions occupying at least 2/3 of the full length of the lower lip& releasing incisions 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 the microstomia.

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

((NOTES))

\*\*Usually we take biopsy before CT scan to know what the lesion is.

\*\*While examination: If the lymph nodes are fixed >> poor indicator.

\*\* If the lymph nodes are mobile >> positive indicator, might be infection.

\*\* In general, the most common risk factor to lower lip cancer is sun light exposure.

\*\* 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. We take CT scan, and find multilocular lesion with buccal cortex perforation. So, the tumor is infiltrating the soft tissue which has to be involved in the excision “Have to take some of the gingiva”. 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 &the inferior border is intact.

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

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

The most important factor in the immediate reconstruction is to have availability in the soft tissue

In this case we removed the soft tissue, so the reconstruction will be delayed. But if we didn’t remove the gingiva, we can do immediate reconstruction.

\*\* Case #7:

There is a lesion occupying the posterior part of the mandible. The first thing we should do is taking 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 area that receives at least 3 screws).

At the End, the doctor talked about these types:

* Osteoma : Anyone can have osteoma, but if the number of these osteomas is above 5 in the maxillofacial skeleton, this is an indicator of **Gardner syndrome** .

The clinical significance of this syndrome is the development of familial polyps which are very malignant lesions. So, Prophylactic polypectomy should be done.

* Giant cell lesions which are :

1-Central giant cell granuloma

2-Hyperparathyroidism

3-Cherubism

4-Aneurysmal bone cyst

All these lesions have the same radiographic and histopathological features.

All of them are multinucleated well demarcated. And all of them have the same histopathological report which is: giant cell lesions containing 5-10 nuclei, in fibrous connective tissue.

We should think in these findings with the clinical features to distinguish between the previous 4 types and to know the treatment plan. For example:

* If the patient has abnormal parathyroid function >> It is Hyperparathyroidism. >> should be referred into endocrinologist to control the parathyroid function >> then the resolution of the lesion will happen.
* If the patient is 2-6 years old >> It is Cherubism.