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Oral Surgery II

**University of Jordan**

**Faculty of Dentistry**

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Hand Out

Slide

Sheet

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This is part 2 of two back-to-back lectures given by Dr. Zaid about Oral Cancer  
Please refer to the handouts while reading.

-Cancer is a common disease that can hit anyone in anytime.  
The current perception is no more about dead or alive, rehabilitation is important.

-Cancer needs to get controlled both in the primary site as well as in the loco-regional areas ; as an example of a loco-regional control of disease is surgeries in the axial lymph nodes as in cases of breast cancer (a very common disease).

-In Oral cancers ; the site of metastasis is the neck region. So , it’s very common in oral cancer surgeries to clean the neck area (i.e. neck dissection which means opening the neck and cleaning the nodes).  
These lymph nodes drain the mouth , that’s why cancer cells tend to creep to this area . If left untreated , they can grow into big tumors in the neck area.

-Crile in 1906 ; was the 1st to suggest exploring the neck area .

-There’s a statistic showing that if the patient has (N+) , part of providing a curative treatment is to cure the neck and it’s not enough to cure the primary site alone .

-Mandibular surgical approaches provide an access to the neck .

-There are superficial and deep lymph nodes in the neck ; Levels of the neck , which are divided into ;  
1) level 1 //submandibular triangle  
2) level 2 //upper jugular  
3) level 3 //middle jugular  
4) level 4 //lower jugular  
5) level 5 //posterior triangle  
🡪This is the simplest classification .  
🡪These areas are relevant to surgery , it’s very important to know the type of neck dissection with the LNs which need resection according to the type of tumor as well.

-The neck has so many vital structures (i.e. the carotid artery and its branches , the jugular veins , vagus nerve , cervical plexus , … , etc) . It’s a risky business , the surgeon must be competent in what he’s doing . The more the LNs out , the better the surgery’s outcome is .

-In Oral cancers ; the submandibular triangle, upper , middle and the lower jugular are mainly involved in neck dissection surgeries . The posterior triangle is rarely messed up with unless there’s adequate evidence of regional metastasis .  
N0 🡪 no metastasis

-How to assess if there is metastasis in the neck region?  
Palpation ; feel the LNs and properly examine your patient , starting systematically with the submental LNs going to the submandibular , upper cervical , upper jugular , mid jugular and lower jugular ... etc .  
🡪 Two important questions after palpation ;  
1) Do the examiner feel anything abnormal ?  
2) Whether the area is tender or not ? (Tenderness has an inflammatory cause , most probably there’s an infection) .

-This is not Enough . If you suspect oral cancer , you have to utilize imaging modalities to confirm your diagnosis .

-The most appropriate Imaging modality used in Oral cancer Diagnosis ; Conventional CT with contrast .  
A thin-sliced (heavy dose) CT scan with soft tissue contrast  
🡪 this technique can show you the LNs up to 5mm (1/2cm) .

-Alveolar tumor near the lower 6 region ; 1st LN suspected here is ; submandibular LN .

-“Skip Phenomenon” ; very important in breast cancer metastasis .  
The tumor cells may go to LNs other than those which drain the primary site .  
Imagine that you exactly know the 1st node that drains a particular site and a patient presented with T1 or T2 tumor with  
 –ve neck bipalpation exam , it’s important to examine this 1st LN area to be sure there’s no metastasis .  
🡪 However , this is not always relevant in oral cancer cases . As you may find a patient with mid or lower jugular LN metastasis . The cancer went all the way down from level 1 to level 4 .

-LNs may enlarge due to many reasons ; i.e. sinusitis , toxoplasmosis , viral infection(EBV) , … , etc . That’s why you need to carefully examine the neck with good radiological assessment .

-When do I decide to open the neck?  
This is an area of controversy in oral cancer research . As cancer is almost always a loco-regional disease .

-Cancer Diagnosis + Tx are multidisciplinary ; the histopathologist is very important , he’s the one who can tell whether there’s muscle invasion or not for example as well as the tumor’s depth .

-If the patient has clinically or radiographically +ve N , you need to open the neck .

-Prophylaxis ;  
1) T1 tumor with clinically+radiographically –ve N , you may get away with not opening the neck .  
2) A tumor in the lower lip doesn’t have a great tendency to metastasize to the neck as a tumor in the tongue’s ventrum or in the floor of the mouth .  
3) A biopsy with signs of aggressiveness or peri-lymphatic invasion indicates possible neck invasion , thus ; you need to open the neck .

-The neck can have no LN metastasis or … (refer to the handout page 8)  
N1  
N2a  
N2b   
N2c 🡪 floor of the mouth “may be bilateral”

-CT imaging determines the tumor’s size . You can take it all the way to the chest to check the lungs (as they’re a possible site of distant metastasis ) .

-Classification of Neck Dissections ;  
A) Comprehensive ;   
+ve N  
the Radical subtype is associated with a lot of morbidity , difficult recovery , no longer used   
the other 3 types mainly preserve 3 structures in the neck ; SCM , internal jugular vein & spinal accessory nerve  
B) Selective ;  
small tumors   
used in exploratory , prophylactic & diagnostic neck dissections  
you select a certain level and open the neck

-If the surgeon could clear the LNs without damaging vital structures it’s better but this is not always possible as LNs are closely attached to one of them , so , you have to resect one of them to clear any neck metastasis .

-Surgical Approaches ;  
A) Y-shaped 🡪 the joining angles in surgeries aren’t favorable as it’s a weak point , sometimes you have to use it .  
B) Apron technique is most commonly used .

-Don’t be afraid to examine the head and neck area of your patient .

-Complications of neck dissections may include ; Recurrence and death , bleeding , sclerotic areas , emboli and strokes , chest perforations and pneumothorax , cerebral edema (esp. in bilateral neck dissections , resulting from damage to the internal jugular vein) , salivary fistula (if you manipulate with the parotid gland) , shoulder syndrome ( damage to the spinal accessory nerve , pain in the ??) .

-Cancer Tx is multi-modal involving ;  
Oncologists are medical physicians “internists” who are specialized in oncology treatment .  
Pathologists  
Radiotherapists

-Surgery is the mainstay therapy of solid tumors .  
-Other Tx Modalities include ; chemotherapy , radiotherapy <U.K,AUSTRALIA>// radiation therapy <U.S.> , targeted therapy .  
-Radiotherapy is all about using ionizing as a part of tx .  
How does it work ?  
Its end results 🡪 cancer cells’ DNA damage , inducing apoptosis ; thus eliminating the whole clone of cells .  
\*2 ways of achieving this ;  
A) Indirect 🡪”conventional radiotherapy” , Photons (or Photons with electrons) // gamma rays at high speeds yield free radicals in water , damaging DNA and inducing apoptosis .  
B) Direct 🡪 “particle therapy” , heavy particles such as protons are used to hit DNA directly to cause apoptosis .  
  
-Radiotherapy does not discriminate between normal and abnormal cells , but why cancer cells are more susceptible to radiotherapy ?  
A) not as mature as normal cells .  
B) high proliferative rate .  
🡪 thus ; their damage susceptibility is higher .

- With advancing software technologies , it’s now possible to conform the shape of radiation beam to the tumor’s shape itself .  
  
-Charged particles are ; proton , boron , neon & carbon ions .  
The good thing about particles is that they have less scatter than photons(weightless and may scatter everywhere) .   
  
  
 remain focused on the tumor   
    
 > expensive & < side-effects

-Radical Radiotherapy ; maximum dose / purpose ; cure .  
-Palliative Radiotherapy ; a big-sized tumor in stage 4 , close to vital structures , the patient isn’t fit for surgery / purpose ; shrink tumor’s size .

-In cases of small “oral cancer” tumors , you may give radiotherapy as the only tx without surgery .  
There’s evidence showing that 🡪 T1 tumors have the same chance & prognosis in both radiotherapy and surgery .

-What’s the problem with radical radiotherapy ?  
Here ; you’re giving the maximum dose , so ; the patient lost the option of radiotherapy as a tx if he returned with recurrence at the same site after a 5-yr interval for example .

The patient should decide what’s the tx option in cases of T1 tumors .

-How is radiotherapy given ?  
\*Breast , liver cancers 🡪 radiation tubes are inserted in the tissues and are left inside for a period of time in order to have continuous radiation ( hitting the tumor from its inner portions ) .  
This is known as “***Brachytherapy***” .  
In head & neck cancers , it’s uncomfortable to use such modality .  
\*Oral Cancer 🡪most commonly used radiation modality is “***Teletherapy***” ; it’s like the usual XRay beam we know .

-Whenever a patient tells you that he received radiotherapy , you should assume it’s the “***Conventional External Accelerated Beam Radiotherapy***” ; this is a single radiation beam (photons) with a possibility of changing its direction . It’s a well-established technique unless the center has more advanced equipment .  
The patient wears a mask (metal shield) with an opening to the intended site of radiation .

-IMR 🡪 3D conformational radiotherapy 🡪 radiation beam shape=tumor’s shape 🡪 minimizing scatter .  
Used in liver tumor cases .  
Sophisticated software shaping of the radiation beam to concentrate tx on cancer cells minimizing damage and scatter .

-Radiation Dose ; in Grays .  
Radiotherapy has a cumulative effect .  
Maximum Dose ; the dose beyond which damage is permanent and may induce other tumors .  
Maximum Dose = (60-80)Gy // for curative purposes .

-Radiotherapists tend **to fractionate** this max. dose and give it to the patient (divide it into fractions) = not given as a single shot .  
\*Biological Reasons for this ;  
A) Water is needed , in order for the tumor to be susceptible to radiotherapy .  
Water is delivered to the tissues through the blood .  
🡪once a tumor grows big , it becomes distant from the blood supply and there’s central necrosis .  
So ; inner portions of the tumor are not susceptible to radiotherapy .  
**Fractionation allows the blood to renourish these areas again as it attacks the tumor in stages .**B) The Scatter Problem   
Once you fractionate , you’re allowing normal tissues to heal .  
\*Skeptics ; they depend their opinions which are against the concept of fractionation by saying that ;  
“fractionating the radiation dose allows tumor cells to proliferate .  
\*Traditional Fractionation   
Dividing the (60-80)Gy over a period of 6 weeks .  
2 Gy/day for 5 days /week for 6 weeks 🡪 30 fractions in 30 sessions   
\*Unconventional Fractionation  
Inconvenient   
let the patient take the daily 2 Gy 2 times a day   
  
-Radiotherapists are the ones who decide the tx modality and the fractionated doses to allow soft tissue healing and time needed before doing surgeries .  
  
-The Approach is ; Surgery then Radiotherapy .  
  
-CHART 🡪 a simple concept “ you attack while giving a chance for revascularization to take place”

over a period of 12 days  
3 fractions are given / day <<60Gy/12>>

“In-patient’  
costy  
scientists who agree with this method claim that “best results can be achieved if radiation fractions are given continuously”  
This modality can only be applied in private centers not under governmental protocols as it’s very expensive “Health economics Vs. Scientific evidence”

-Chemotherapy plays a lesser role …  
A)Works through chemical interactions .  
B)like radiotherapy , it’s not selective (affects any cell) with side-effects .  
C)In solid tumors , it’s used as adjuvant therapy   
D)Shrinks tumor’s size –use in oral cancer’s tx // without using radiotherapy  
E)less effective in treating oral cancer but most effective in hematopoitic cancers   
F)IV access   
G)Commonest chemotherapeutic agent ; Cis-platin   
H)In some countries , to make the chemotherapeutic agent more selective to oral cancer tx with less side-effects ; they tend to inject it in the lingual or the facial artery .   
I)Given as one shot/ every 3 weeks   
J)Oncologists decide where to give it   
  
-Targeted Chemotherapy = Adjuvant Chemotherapy  
  
-Targeted Immunotherapy ; Adjuvant and NOT CURATIVE  
A)Used mainly in colon cancers and breast cancer as well  
B)The agent (drug) used in oral cancer is Cetuximab / IgG1 monoclonal antibody , for distant metastasis ?(not sure)  
  
-***Again , Oral Cancer is a solid tumor and surgery is the mainstay for SCC  
Radiotherapy is almost always there   
Chemotherapy has a role  
Targeted therapy as well  
Stage 4 needs extensive tx ; palliative mostly !  
Neck Dissection is almost always done   
In rare cases 🡪 there’s no need to do neck dissection  
Radiotherapy is given to both ; site + neck (locoregional)***

-Factors that dictate the use of radiation at the primary site and the neck /// refer to the slides please   
Extra notes on this ;  
+ve margins ; clean but close // give radiation therapy   
tumor cells outside the margin of LNs // give radiation therapy  
  
Good Luck Seniors :D