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Critical Introspection of Neck in Oral Malignancies and Maxillofacial Pathologies

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A B S T R A C T

There are innumerable variety of maxillofacial pathological diseases. In that some of them classically show the involvement of neck along with maxillo-mandibular region. Such disease entities need a special considerations since they may show impact on vital structures in the neck such as trachea, thyroid gland, great vessels, cranial nerves, cervical spine or vice-versa. In such conditions the oral and maxillofacial surgeon must be aware of the way of approaching the proper diagnosis in order to render better treatment along with multidisciplinary approach. This approach is needed in terms of not only diagnosis, but also in securing general anesthesia and performing surgical procedures, in which the neck plays a very crucial part. If any neck pathology is present along with maxillofacial region, it must be differentiated and appreciated thoroughly whether it is a combined or a separate entity of disease. Such approach broadens the treatment horizon for better treatment outcomes. A series of 10 such cases are presented within our clinical experience.

Keywords: Neck evaluation, maxillofacial diseases, oral cancer.

INTRODUCTION

Evaluation of neck plays an important role in view of maxillofacial surgery, general anesthesia and the disease entity involved. Often, the benign and malignant pathological diseases involving the maxillofacial region are associated with neck which need thorough attention. Gross details of important structures like great vessels, trachea, vocal cords, thyroid and pharynx should be paid attention, since these structures are linked to maxillofacial diseases, surgical procedures and general anaesthesia. Such overview helps for better treatment outcomes.

Maxillofacial diseases such as benign and malignant tumors, fascial spaces/jaw infections, obstructive sleep apnoea, temporomandibular joint ankylosis etc, involve neck in inclusion. Less often than not, certain anomalies exist in the neck which are coincidentally identified should be addressed with multi-disciplinary approach. In certain pathological diseases and anatomical aberrations, relevant investigative measures including histopathology give a confirmatory diagnosis.

Self awareness regarding interlink between head and neck pathologies related to maxillofacial region is necessary to differentiate them from diseases of Otolaringological and systemic origin. In this regard radiological investigations and histopthology play an indispensible role. Pathologies arising from maxillo-mandibular region may also compromise the upper aerodigestive tract which urges the maxillofacial surgeon to diversify the focus in treatment

approach. In such conditions, the risk factors such as age, severity of pathological disease, general health and performance status, systemic diseases have also to be considered. The aim of this article is to share our clinical experience with an emphasis on importance of evaluation of neck in oral cancer and maxillofacial diseases. Our insights are presented through the following 10 case reports.

Case 1:

A 75 year old male patient was diagnosed with moderately differentiated squamous cell carcinoma of the right buccal mucosa and retromolartrigone area in the right side of oral cavity. General condition of the patient was fair at the time of patient consultation. Wide local excision and modified radical neck dissection II + reconstruction with Pectoralismyocutaneous flap was performed. The patient developed a surgical site infection at the operated site on the fourth post operative day. The flap gaped with residual large oro cutaneous fistula encroaching the anterior neck inspite of water tight closure. Post operative large oro -cutaneous fistula developed, leading to surgical site infection due to salivary leakage and poor immunity and nutritional status, lack of patient awareness regarding post operative care and maintenance. Patient had no significant medical history.

Diffused discharge of pus was present along with salivary leakage through the oral cavity into the neck. The origin was discreet and no particular local site was seen clinically to identify the site of pus discharge. The pus was sent to culture and sensitivity which showed species of Klebsiella, streptococcus, pseudomonas and clostridium. The infection was unresponsive to cephalosporins, metronidazole, pencillin, except for impinenam. The infection lasted nearly for 45 days which was reducing but not subsiding inspite of giving local dressings twice daily with Eusol and warm saline and betadine at the surgical site. At this juncture, the goal was to seal the oral cavity by creating a barrier with local flap reconstruction if the infection subsided. The oral cavity fistula was closed by primary closure to control the salivary seepage as the pus discharge from oral cavity controlled. The defect of the fistula was 5cm inside the oral cavity and 7cm in the neck. The wound in the neck was left open as the pus was coming diffusedly. Repeated dressings twice daily were advised till the wound granulates, which was the only choice left out. The cause of infection at the surgical site was difficult to figure out even though the surgery was carried out under aseptic conditions .Predictability of body's immune response of the patient was the difficulty that we encountered. It is well known fact that the surgery triggers stress and immune response in the body.

Various causes of surgical site infection were differentiated such as poor nutritional and immune status of the patient, nosocomial infection. With regards to this patient we thought that the cause of surgical site infection was due to his poor innate immunity and nutritional status. It was very critical to observe that the wound infection sub sides such that the fistula could be closed with local flap reconstruction. The patient was from a poor economic background with poor imune compliance to surgery which was noticeable only after performance of the surgery. In spite of the best efforts, the patient was debilitating due to strong pathogenic bacterial resistance towards intravenous antibiotics as mentioned above. The regression with imipenam antibiotic thrice daily (8hrly) was considerably satisfactory but with persistent mild infection periodically. There was no recurrence at the primary tumor site. It was obvious that the fistula closure cannot be done unless the seepage of pus, saliva through the orocutaneous fistula subsides. However the patient developed cervical lymphnode metastasis at level II and III, IV and skin metastasis towards 45^{th} h day. The patient was being fed through nasogastric tube. Since the wound in the neck did not heal due surgical site infection, the patient could not be advised for post operative radiotherapy, and was referred to palliative care unit for further management.

From the experience of this case, we learnt that assessing the immune status of the patient with oral malignancy could give a clue about the surgical outcome to a certain extent. At the base line level,the assessment of immune markers such as differential count, CD3, CD4, CD8(Cluster of differentiation antigens for immuno phenotyping), Macrophage count, immunoglobulins IgG, IgM, IgA, T cell and B cell count and at the specific level CA-125, Ki-67, PD-L1(immune markers) etc could give insight into the immune status of the patient, there by measures to improve immunity can be further planned and implemented.

Case 2:

A 41 year old female, with T4aN2b M0 diagnosed with moderately differentiated squamous cell carcinoma involving the right lower gingivobuccal sulcus, floor of the mouth, retromolartrigone, posterior mandible and skin diagnosed along with multi nodular thyroid goiter (nodule size- 4.3cm in right lobe, 4.5cm in left lobe (papillary carcinoma) of bilateral lobes underwent Tracheostomy+ Wide local excision+ segmental mandiblectomy + MRND type II+ Pectoralis major myocutaneous flap repair along with total thyroidectomy bilateral selective neck dissection (level I-IV on right side II-IV on left side+ central compartment clearance). Tracheostomy was performed in view of narrow and deviated trachea, as well as to prevent tongue fall back and aspiration pneumonia. No other co-morbidities were reported in the patient.

A narrow trachea was present which was identified on chest x ray. Elective tracheostomy was done prior to the commencement of surgery under general anesthesia. Before hand, vocal cords were examined for mobility through

flexible nasal endoscopy for eliciting the recurrent laryngeal nerve status/injury. For induction of general anesthesia, nasal intubation failed due inadequate mouth opening secondary to malignancy. Therefore endotracheal intubation was planned by tracheostomy. Upon exploration a narrow trachea was found of diameter approxiamately 6mm. The patient had a flail chest with a narrow respiratory passages and the patient was thin built. Due to narrow trachea the surgery was planned to carry on with the insertion of cuffed endotracheal tube of 5mm diameter through tracheostomy. The endotracheal tube was replaced by a cuffed tracheostomy tube of 5mm diameter during the time of extubation. Throughout the procedure, the patient had no problem with ventilation of lungs during general anesthesia and surgery. The patient was kept on ventilator post operatively. She was deventillated on 1stpost operative day. The patient developed cough, choking probably due to aspiration on 2ndpost operative day due to accumulation of mucous secretions in the trachea. It was managed by toilet of trachea, humidification, nebulization with salbutamol respules and periodic suctioning. She was kept on ventilator for one day. She was stable on 3rdpost operative day, and was deventillated. There were no signs of hypocalcemia. The patient was stable discharged on 7thpost operative day. Follow up was done at 15th, 30th day intervals. The patient underwent post operative radiotherapy and follow up of thyroid status was done by otorhinolaryngologist.

This case gives an insight regarding the anticipated complications that could be associated with narrow trachea such as aspiration pneumonia, tracheal injury/perforation during thyroidectomy and neck dissection, securing a tracheostomy tube safely in the post operative period, aspiration of liquids into the trachea, tracheal stenosis due to narrow tracheal lumen, hypocalcemia etc.

Case 3:

A 32 year old gentleman with T4aN1Mx disease was diagnosed with well differentiated squamou cell carcinoma of the tongue and floor of the mouth on right side of the oral cavity. No significant medical history was present. During neck dissection it was observed that there was an anomaly in relation to external carotid artery and internal jugular vein. The preoperative MRI scan has no specification about the anomaly in the great vessels. This was coincidentally identified during the neck dissection in view of ligating the lingual artery, since there was a profuse bleeding from the tongue intra operatively. Upon exploration, it was observed that the external carotid was lying in posterolateral position to sternocleidomastoid, parallel to internal carotid artery in the right side of the neck. The external carotid artery was identified based upon the medial branching pattern of it and ligated. Post operatively the patient was subjected to Colour Doppler ultrasound to assess the status of carotid artery and collateral circulation, which confirmed the same. The patient was discharged on the 7thpost operative day and was followed on 15th, 30thpost operative days and was later endorsed for post operative chemoradiotherapy.

Case 4:

A 33 year old lady diagnosed with T2N1 M0 of well differentiated squamous cell carcinoma of right lateral border of the tongue underwent wide local excision+ facial artery myomucosal flap repair+ extended supraomohyoid neck dissection. In 8 months post operative phase, she developed a nodular swelling along the incision line in the neck. Ultra sound scan of neck and FNAC of the nodule, revealed skin metastasis. It was differentiated from inflammatory swelling, lymphnode metastasis to and skin metastasis. Patient had no other medical problems orco-morbidities.The FNAC and biopsy report confirmed skin metastasis. The patient was referred to palliative care for further management. We observed that the patients should be made self aware regarding the changes at the operative site in the oral cavity and neck, as well as a thorough and timely follow up at regular intervals as scheduled.

Case 5:

Carcinoma of the right lateral border of tongue in a 28 year old pregnant lady in second trimester (5th month). On clinical examination, the lesion was appearing as erythroleukoplakia which turned out to be a well differentiated squamous cell carcinoma with T2N0M0 staging. Routine blood investigations and an ultra sonography of tongue and neck were advised. Wide local excision+ extended supra omohyoid neck dissection + primary repair were performed. The duration of surgery was 90 min. The patient had to be operated for the nature of the disease (malignancy). All the precautions were taken for administration of general anesthesia with gynecologist supervision during pre, intra operative and post operative intervals. The lady had no other significant medical history. It was a challenging case in terms of surgery, general anesthesia and the patient's physiological condition. The patient recovered uneventfully post operatively. She was discharged on 10th postoperative day from ward under gynecologist supervision and was followed up at 15 day intervals for one month post operatively. Thereafter the patient was kept on a monthly follow up to check cervical metastasis and recurrence. The primary site and the neck were unremarkable. The patient was subjected to post operative radiotherapy after 15 days of delivery of a healthy baby.

Case 6:

A case of Congenital muscular Torticollis on the right side of neck was operated in a 19 year old female patient. The patient presented with a short neck bent towards right side. MRI scan was advised which showed no adhesion of

muscle to the underlying great vessels and no other neck pathology. Myotomy of the clavicular head of sternocleidomastioid muscle was done which was sutured to the clavicular head. Neck exercises were advised by the physiotherapist from second post operative day. Neck support with cervical collar was advised for one week postoperatively along with physiotherapy. Post operative follow up was done during 7^{th}, 15^{th}, 30^{th} day, 2^{nd} and 3^{rd} and 6^{th} month intervals. the muscle gained strength from 3^{rd} week. Erect position of the neck was achieved with normal flexion and extension.

Case 7:

A case of intraosseous carcinoma in a 54 year male, of approximately 5cm involving the left body of the mandible. To mention, there was no cervical lymphadenopathy. The gingivobuccal sulcus was presented with a bony hard swelling of size 5.5X 5 cm with no discharge on aspiration. A differential diagnosis of malignant neoplasm, squamous odontogenic tumor, ossifying fibroma were made. The lesion on the orthopantomogram was appearing indurated, radioluscent with erosive borders. Contrast enhanced CT scan showed osteolytic lesion with heterogenous appearance. Incisional biopsy confirmed solid variant of primary intra osseous carcinoma in histopahology report.

Primary intra osseous carcinoma is of three types, namely solid variant, of odontogenic cyst origin and benign epithelial odontogenic tumors. Selective supra omohyoid neck dissection prophylactically was done along with wide local excision by sparing 1cm clear marginin the mandible.It is a wise option to open the neck surgically for staging of the neck and therapeutic purposes, to perform supra omohyoid or super selective neck dissection in malignancies of odontogenic origin. In the literature some cases have been reported which were treated by post operative chemo radiotherapy.

Case 8:

A case of left gingivo buccal sulcus of left mandible in 62 years male patient, secondary to tuberculosis of staging T3 N1M0 was treated. The incisional biopsy at the primary cancer site was done which showed moderately differentiated squamous cell carcinoma, tuberculous ulcer was ruled out there by differentially. The patient was under 6 months anti tubercular drug regimen at the time of diagnosis of oral cancer disease. The patient has been taking antitubercular drugs for three months till that time. The patient was referred to a pulmonologist for evaluation of tuberculosis status prior to surgery. There were no active symptoms of the disease at the time of surgery. The patient was evaluated with early morning sputum examination for Acid fast bacilli, tuberculin test, chest X ray, CT scan neck and thorax along with routine blood investigations prior to surgery. The patient underwent segmental mandiblectomy+ MRND type III+ primary closure under general anesthesia. The patient was advised to continue antitubercular drugs pre and post operatively. The patient was discharged on 10^{th} postoperative day uneventfully. Thereafter the follow up was done on 15^{th} and 30^{th} postoperative day. The patient was referred for post operative radiotherapy after consultation with the tumor board.

Case 9:

A case of ectopic thyroid in the right body of mandible was observed in a 65 year old lady. Her complaint was obstruction of the swelling in the oral cavity while chewing food. The patient had occasional pain with no signs of tenderness, inflammation, infection or any sort of discharge The lesion was appearing radioopaque, bilobed on orthopantomogram with well defined borders. Upon incisional biopsy, a diagnosis of ectopic thyroid was confirmed in histopathology report. The patient was hypothyroid as noticed in blood tests. An ultrasound scan of neck showed aplasia of thyroid gland in the neck. The patient was referred to an endocrinologist for further evaluation regarding hypothyroidism and was followed up by us as well. The patient was kept on Levothyroxine-100mcg tablet once daily and was followed up at 7^{th}, 15^{th}post operative day and on a monthly basis for3 months and at 6^{th} month and 1 year intervals. The patient was stable.

Case 10:

A case of Eagle's syndrome in a 55 year old male patient was treated. Patient had pain in the neck which referred to the mandible bilaterally upon flexion and extension of neck. He also had change in voice (hoarseness) and difficulty in swallowing. The patient consulted otorhinolaryngologist at first, and had no concerned findings regarding disphagia as his vocal cords, tracheolaryngopharynx and other structures were normal. The CT scan of neck (plain) advised by otolaryngologist did not comment on elongated styloid process. Cervical spondylosis was ruled out. The patient was referred to us regarding the evaluation of pain in the mandible. An orthopantomogram revealed elongated styloid process bilaterally. Further 3D CT scan showed elongation measuring 3.7 cm on left side and 4.4cm on right side. Thereby a diagnosis of Eagle's syndrome was established. Intoto excision of the styloid process was done under general anesthesia by bilateral submandibular incision. Patient was discharged on the third post operative day as the recovery was good. He was advised neck extension and flexion exercises from second post operative day till two weeks and was followed up every week for the first one month and every 15 days thereafter till 2^{nd} month. Later the patient was followed

up on monthly basis for the next 2 months. Patient was asymptomatic and showed improvement with regards to his previous complaint of neck pain and jaw pain.

Fig 1 & 2: Oro-cutaneous fistula in oral cavity and anterior neck measuring 5X3 cm in oral cavity and 5X6cm in the neck

Fig 3 & 4: Deviation of trachea towards left, as postero anterior view and lateral view of Chest X ray

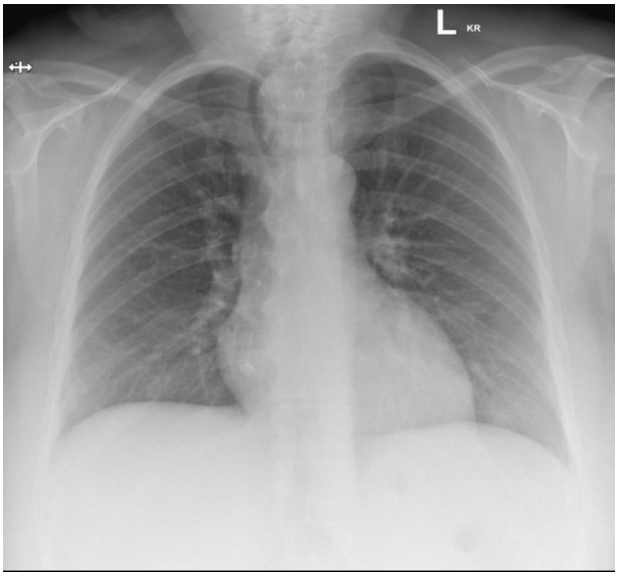

Fig 5: Chest X ray showing a narrow trachea in a thin built malnourished patient with slender neck

DISCUSSION

Head and neck diseases show a diversified pattern under which the diseases of the maxillofacial region occupy a unique subset, occurring as a single entities or as a combined entities or as two separate entities inhabiting simultaneously [1, 2]. Some of the oral cavity lesions may mimic both benign and malignant disease which can be only proved by a biopsy report [3].

Vascular anomalies of internal jugular vein and common carotid artery either unilaterally or bilaterally are not uncommon [4, 5]. Most of these kind are observed upon opening the neck surgically or in the radiological examination. More so particularly, 3D/4D colour Doppler ultrasonography, MRI contrast scan would help assessment of vascular anomalies of head and neck. In view of vascular anomalies and ligation of blood vessel in the neck, the surgeon should insist on the comment of radiologist/ultrasonologist/nuclear medicine specialist in the report. We came across one such case where in external carotid artery was located postero lateral to sternocleidomastoid.

Oral cancer occurring in a pregnant lady is a challenge to operate, where in prognosis depends upon the trimester. Women with oral cancer operated in second and third trimesters showed promising results with calculative risks [6].

There are cases illustrated in the literature where in oral cancer has occurred simultaneously along with papillary carcinoma of thyroid, which was our unique experience as well. Irrespective of the type of disease of maxillofacial region that involves neck in combination, the anatomy or the anomaly (tracheal stenosis) of the trachea is important to assess in terms of securing intubation for general anesthesia or to perform tracheostomy for securing the airway to prevent airway obstruction. Two such cases were presented in our experience which increased our insights in treating them. The surgeon should insist for a comment in a report about, the tracheal width, deviation, compression etc. This reduces the ambiguity and surgical morbidity to a larger extent. In our experience we have come across two unusual cases which made to change the evaluating pattern of neck which made to put an insight into the way of approach to examine the neck clinically and radiologially.

In cases of tracheal deviation or compression due to thyroid neoplastic goiter, it becomes crucial and challenging to perform tracheostomy. Patients of maxillofacial diseases with hyper/hypothyroidism should be monitored in terms of variations in basal metabolic rate, cardiovascular problems or pituitary gland abnormalities in view of general anesthesia. As these both categories come under ASA III, administration of barbiturates, CNS depressants, opioid analgesics, anti anxiety drugs in hypothyroid and atropine in hyperthyroid patients should be restricted [7-9].

The probabilities and possibilities of surgical site infection should be anticipated especially when reconstructive surgery is needed, by keeping in mind, the prognostic factors like, age, nutritional status, immune status, co-morbidities, long duration of surgery etc, particularly when dealing with cases related to oral cancer. It was observed in one study that, increased levels of immunoglobulins with advanced stage of oral cancer are indicative of an adverse prognosis and decrease in survival rate[10].

In Maxillofacial diseases involving the maxilla-mandibular region and neck, the evaluation should be thoroughly complete by clinical, radiological and histopathological means, wherever applicable. More importantly, the factors such as lymph node examination, vascular anatomy of great vessels (internal jugular vein and common carotid artery), width of trachea, congenital anomalies of neck, diseases related to cranial nerves 9,10, 11, 12, tracheal diameter and size thyroid disease/hormone levels should be investigated. Emphasis should be made on neck shapes such as short neck/thin slender neck in anticipating difficulties during neck surgeries. The cervical spine status, sterno-clavicular joint, hyoid bone along with supra and infra hyoid muscles should be examined and commented depending on surgical site. The vocal cord examination by functional nasal endoscopy may also be needed in terms of tracheostomy for endotracheal intubation.

CONCLUSION

Through the clinical experience, the outcome of our study reveals that whether the disease is of congenital, trauma, tumor, infection, irradiation, the critical examination of the neck has to be done in diseases involving maxillofacial region and neck.

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