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Physiotherapy approach for well-differentiated squamous cell carcinomas of upper anterior alveolus: A case report

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ABSTRACT

HNCs are the sixth most prevalent type of cancer in the globe oral squamous cell carcinomas (SCCs) account for more than half of all reported neck and head cancers, with an estimated 3.1 million cases diagnosed each year and is responsible for 3% of all cancer deaths. We present a case of a 58-year-old woman admitted to the hospital with complaints for 9 years, she has had a non-healing ulcer on the upper front of her jaw and a burning sensation while eating, as well as a change in saliva consistency, on further history she revealed that the patient had a painful, non-healing ulcer on the upper front region of the jaw. On further investigation, the histopath report was suggestive of pseudo epithelial hyperplasia after the review of the slide and block of the right side of well-differentiated squamous cell carcinoma so, under general anesthesia, she had composite resection of the lesion, substructural maxillectomy to pterygoid plates, modified radical neck dissection, and reconstruction with temporalis flap on the right side. After which physiotherapy call was noted and on examination found out that patient has restricted range of motion of the jaw, cervical and shoulder movements with pain. So Physiotherapy management along with other conventional modes of treatment is essential to recuperate from orofacial cancer.

Keywords: Squamous cell carcinomas, upper anterior alveolus, substructural maxillectomy.

1. INTRODUCTION

Head and neck cancers (HNCs) are the world's sixth most common carcinoma. Squamous cell carcinomas (SCCs) of the oral cavity account for more than half of all reported neck and head malignancies, with approximately 3.1 million cases identified each year (Baishya et al., 2019). The impacted demographic group in high-incidence countries like India, Pakistan, and Sri Lanka is below 40 years old. SCC of the oral cavity is responsible for 4% of all cancers in men and 2% of cancers in women (Abraham et al., 2019). 9 percent of all cases of oral SCC are caused by SSC of the alveolar ridge. According to site-specificity, the common SSC is alveolar ridge SSC, with the first being tongue

cancer. Mandibular alveolus neoplasm has the greatest recurring rate when it comes to local recurrence rate by the site (Patel et al., 2019) and is responsible for 3% of all cancer deaths. When compared to other oral carcinomas, oral squamous cell carcinoma of the mandibular region has the lowest chance of surviving. Squamous cell carcinoma of the mouth might take the form of a white plaque to an ulcerated lesion (Siriwardena et al., 2020). Because of the high incidence of smokeless tobacco use in India, oral cancer has arisen as a major health concern (Suresh et al., 2019). The excessive intake of areca nut and tobacco in any form in these locations may be responsible for the higher prevalence of OC. The bulk of OSCC instances (90 percent) are linked to tobacco use in various ways, with alcohol and smoking being key contributing factors. Furthermore, Chronic irritation, poor oral hygiene, occupational exposure, viral infection, malnutrition, low vegetable and fruit diets, and hereditary variables have all been recognised as potential risk factors for the development of oral cancer (Panchbhai and Bhowate, 2020). Because the upper alveolar (ridge) mucosa is so close to upper anterior alveolus can extend to the upper gingivo- buccal sulcus or the top section of the mucosa (buccal), making treatment challenging and to pinpoint the disease's exact origin. Only 3.5 percent of all OCs were found in gingival upper region.

Oral cavity SCC shows a proclivity for lymph node malignancies in the regional area. OSCC frequently causes swallowing and chewing problems, as well as speech and esthetic issues, all of which can reduce a patient's quality of life. Clinical and radiological examinations are both performed (OPG, MRI, CT and bone scans with ultrasound, and PET CT), and histological investigation are all utilised to determine mandibular invasion (Akbulut et al., 2011). Oral carcinomas are frequently misinterpreted as various inflammatory lesions in the mouth, causing delays in treatment. As a result, for the best treatment success, health care providers must diagnose and treat oral cancer early.

2. PATIENT INFORMATION

A fifty eight year-old woman was admitted to the ENT ward with chief complains of non healing ulcer on the upper front region of jaw and burning sensation on consumption of hot and spicy food since 9 years approx and complains of change in change in saliva consistency from thin to thick and ropy since 8 years approx. The patient presents with excruciating pain, non-healing ulcer over the upper front region of the jaw which began small and steadily to its current size of around 53 cms approx. Pain's onset was slow, dull, intermittent and localised in nature. Pain aggravates on mastication and manipulation since 2 months approx and relieves on its own over a time, On NPRS pain was 5, and has history of loss of appetite since 4 years and hence had weight loss.

Figure 1 showing composite resection of the lesion, substructural maxillectomy to pterygoid plates, modified radical neck dissection, and reconstruction with temporalis flap on the right side.

On further investigation histopath report which was suggestive of pseudoepithelial hyperplasia after the review of the slide and block the right side of well differentiated squamous cell carcinoma so she had composite resection of the lesion, sub structural maxillectomy to pterygoid plates of right side, and radical neck dissection (modified) of right side and reconstruction with

temporalis flap of right side under general anesthesia (fig 1). After which physiotherapy call was noted and on examination found out that patient has reduced ROM of jaw, cervical and shoulder movements with pain. So, further management was carried out.

Patient had history of tooth exfloration of lower left back region. 8 years back patient undergone a surgery at Bombay hospital for removal of tumor from upper front alveoulus and then she underwent incisional biopsy from right buccal mucosa "squamous mucosal hyperplasia" on 24/07/2021 after which patient underwent surgical removal of pyogenic nodule under general anaesthesia at akola. Patient is known case of HTN since 3 years and consumes tobacco 3-4 times a day for 10 years approx. There was no relevant family history. There was no sleep discomfort. Bladder and bowel movements are normal.

3. CLINICAL FINDINGS

After taking consent of patient, physical examination was performed. On general examination patient was conscious, cooperative and well oriented with time place and person. Posture was evaluated in which we found patient has forward head and was able to correct with verbal cueing. On manual muscle testing of upper trapezius we found out on the affected side i.e. right side it was 3 and on left side it was 4. Pre-treatment cervical, and shoulder range of motion, and mouth opening was noted and tabulated in table 1.

Table 1 Showing pretreatment range of motion.

	RANGE OF MOTION	
CERVICAL	RIGHT	LEFT
Flexion	58	70
Extension with TMJ open	55	55
Extension with TMJ closed	50	50
Right Lateral Flexion	30	45
Left Lateral Flexion	30	45
Right rotation	60	85
Left rotation	60	85
SHOULDER		
Flexion	Right: 130	Left:150
Abduction	Right: 140	Left:150
TMJ (mandibular depression) (mm)	33mm	

Outcome measure

NPRS: pre-treatment it was 8 and post treatment it was 3.

Mallampati score: on pre-treatment it was grade 3 and post treatment it was grade2.

Timeline are shown in table 2.

Table 2 timeline

Date of Hospital Admission	23/10/2021
Date of Discharge	16/11/2021
Date of Physiotherapy rehab initiated	3/11/2021

Diagnosis

Well-differentiated squamous cell carcinomas of upper anterior alveolus

Therapeutic intervention

The patient received extensive education during the initial examination; including the role of physical therapy in maintaining and regaining function during and after treatment, energy conservation, maintaining an active lifestyle, skin care and impact of nutrition and hydration during treatment. She was told to do cervical active ROM exercises in all directions, including flexion, extension, lateral flexion, and rotation for 10 repetitions, as well as scapular protraction and retraction were taught for 10 repetitions. To maintain cervical mobility, posture, and muscle length during treatment, supine deep neck flexor endurance training and upper trapezius and pectorals stretches were taught, each of which was repeated 10 times. To alleviate upper trapezius weakness, shoulder shrugs were introduced. To increase shoulder range of motion finger ladder (wall) exercises were given in flexion and abduction (figure 2). To make treatment more effective while also saving time a sponge ball was used to improve forearm muscles and neuromuscular retraining to shoulder girdle muscles was offered.

Table 3 showing post treatment range of motion

	RANGE OF MOTION	
CERVICAL	RIGHT	LEFT
Flexion	70	70
Extension with TMJ open	55	55
Extension with TMJ closed	50	50
Right Lateral Flexion	40	45
Left Lateral Flexion	45	45
Right rotation	80	85
Left rotation	85	85
SHOULDER		
Flexion	Right: 145	Left:165
Abduction	Right: 160	Left:165
TMJ(mandibular depression) (mm)	40mm	

Figure 2 showing finger ladder (wall) exercise to increase range of motion.

Mouth-opening activities (oro-motor exercises) were also prescribed for her, including active mandibular depression stressing temporomandibular rotation and gradual relaxation focusing on the muscles of the neck and head, as well as jaw stretchers to increase mouth opening. Along with it 2-3 ice cream sticks were asked to keep in mouth after every 2-3 hours in a day so that it increases mouth opening range. For reducing pain hot packs and TENS (Transcutaneous Electrical Nerve Stimulation) was given to cervical region and along with it patient was given ankle toe movements for 25 repetition of 1 set. Knee bending exercise, static quadriceps, hamstring, glutei, and back was given for 10 repetition of 1 set and was asked to hold for 10 sec.

Dynamic quadriceps, hamstring was given for 10 repetition of 1 set and was asked to hold for 10 sec. Straight leg raise was taught to patient for 10 repetition of 1 set. Thoracic expansion exercises with upper limb mobility were taught for 10 repetition of 1 set and along with it pursed lip breathing was taught which is shown in figure 3. Postural guidance was given to patient to reduce forward head posture for which chin tucks were given and ask them to hold for 5 sec. All these exercises were commended 2 times a day. This intervention was given for 4 weeks and again post treatment examination was conducted and noted that on manual muscle testing right side measured 4 and left side measured 5, posture was corrected i.e erect and post treatment range of motion is mentioned in table 3. After which home exercise program was explained, and all the activities were prescribed as mentioned above which would indeed increase the responsiveness of the exercise program to patient.

Figure 3 showing thoracic expansion exercise to increase thoracic mobility to prevent use of accessory muscles of respiration.

4. DISCUSSION

The most prevalent sites for oral cancer are gingiva, while the second most prevalent location is the mandibular alveolus. The increased usage of tobacco, betel nuts, and hookah or lime to make a quid in parts of Southeast Asia is increasing the incidence and prevalence of oral cancer. Males had an annual incidence rate of 1.1-2.4/1000 and females had an annual incidence rate of 0.2-1.3/1000 of developing potentially malignant illnesses. Morris et al., (2011) had observed that upper alveolus tumours are prevalent in females. While in other studies it is observed that upper alveolus tumours is prevalent in male.

Johnson (2021) found that the most common kind of upper alveolus SCC was the moderately differentiated variation. While in other study most common type of tumour differentiation in the study is WDSCC of the upper alveolus. Proper physiotherapy management was found out to be effective to treat patients with squamous cell carcinoma to increase ROM of jaw, cervical and shoulder movements and to reduce pain efficiently.

5. CONCLUSION

Physiotherapy management along with other conventional modes of treatment is essential to recuperate from orofacial cancer, so physiotherapy conservative treatment was used, including stretching exercise, breathing exercises, bed mobility exercises and strengthening exercises which was found effective.

Patient Perspective

The patient's parents had physiotherapy rehabilitation, which helped them improve their child's development, achieve milestones as well as gain confidence.

Informed consent

Written and oral informed consent was obtained from all individual participants included in the study. Additional informed consent was obtained from all individual participants for whom identifying information is included in this manuscript.

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Author's contributions

Our every author contributed equally in this case report.

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Conflicts of interest

The authors declare that there are no conflicts of interests.

Data and materials availability

All data associated with this study are present in the paper.

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