Case study

Post operative physiotherapy management of carcinoma of squamous cell: A Case Report

ABSTRACT:

Buccal mucosa carcinoma of squamous cell is an uncommon kind of oral cavity cancer that is known to be dangerous. It's also linked to a high probability of local regional recurrence, and it's more likely in persons who chew tobacco and/or smoke, whether or not they drink alcohol. A 48 year patient is an elderly man who works as a farmer, mesomorphic built with buccal mucosa carcinoma of squamous cell came to the oral surgery department with buccal mucosa skin involvement and underwent surgery with clinical symptoms of discomfort, limitation of movements at the operated site, chest pain, and limited mouth opening, with an emphasis on physiotherapy care after surgery.

Key words: Buccal mucosa, carcinoma of squamous cell, physiotherapy, quality of life

INTRODUCTION:

The most common kind of oral cancer is oral carcinoma of squamous cell, which accounts for the great majority of cases .(1) Whereas the oral cancer is quite common, prevalence of oral cancer varies widely throughout the world, it is generally agreed that the oral cavity is the 6th to 9th most frequent anatomical site for cancer, depending primarily on the nation (and even geographical area in certain countries) and gender of the patients.(2)

Chewing tobacco, kharra, and consuming alcohol are all known risk factors for oral carcinoma of squamous cell.(3) Oral carcinoma of squamous cell is a condition that affects adults and the elderly, with the most frequent clinical

manifestation being an ulcerated tumor with a necrotic core region and raised rolling borders.(2)

Buccal mucosa carcinoma of squamous cell is believed to be aggressive oral cavity cancerous malignancy and has a proclivity for recurrence.(1) The most common postsurgical oral problems after any surgical technique includes pain, infection, swallowing problems, speech difficulties etc. The most fundamental concept of surgical oncology is to remove the primary tumour while leaving a broad margin of healthy tissue [3]. Yet, particularly in Buccal mucosa, carcinoma of squamous cell, it is unclear what defines a sufficient acceptable margin. (4) Surgical procedures for buccal mucosa carcinoma of squamous cell includes various techniques compartmental resection of lesion, segmental mandibulectomy, partial or complete maxillectomy, modified radical neck dissection etc. and surgical reconstruction with the major pectorals flap of muscle and skin.

For post operative rehabilitation, with oral or buccal mucosa carcinoma of squamous cell, physiotherapy plays an important role, which includes various techniques such as mouth opening exercises, shoulder shrugs and shoulder mobility exercises, head and neck mobility exercises, pursed lip breathing exercises, thoracic expansion exercises, bilateral upper and lower limb strengthening exercises etc. Physical therapy management should include mobility exercises as a fundamental element.

Patients should be given exercises in which they make use of their own muscles to accomplish motions in their full movement range, and outer forces can be applied to strengthen masticatory musculature. The jaw-closing muscles and jaw opening muscles are strengthen by these activities. (5). It helps to prevent and/or treat a variety of side effects that might occur as a result of cancer treatment. Physiotherapy therapeutic interventions assist cancer survivors, particularly postoperatively, in regaining normal movement range and thereby enhance the standard of living.(1,6)

Patient information:

A 48 year patient is an elderly man who works as a farmer, mesomorphic built and right-hand dominance came to the tertiary care hospital with complaints of painful ulcers in upper left Jaw's front portion, which was relatively small initially and further increases to 6 x 4 cm approx., since last 4 months. Pain was dull aching, periodic, and localised in character, with a slow start. Pain got aggravates on consumption of hot and spicy food, mastication and manipulations and relieves by analgesics. With that, patient was also complaining of increased salivation and difficulty in mastication. Patient has given a history of 7-8 times tobacco chewing each day, and alcohol consumption from last 10 years. There was no history of hypertension, diabetes, asthma and tuberculosis. Patient has prescribed some medications for the same but it again appear within a few days, he was then recommended to do diagnostic procedures including a biopsy, and it shows carcinoma of left buccal mucosa (T4a N1 Mx) in oral cavity. After that patient has undergone compartmental resection of lesion. Modified Radical neck dissection performed over left side, and bite composite resection of lesion was performed. Segmental mandibulectomy done from 32 to sub sigmoid notch of left side and maxillary alveolectomy done from 25 to tuberosity of left side. After that surgical site packed with warm saline guaze and defect measured and transferred over chest over left side. Standard marking for Pectoralis Major Myo-cutaneous Flap done over left side, then flap harvested and tunneled over clavicle to approximate over the defect, after that reconstruction done with Pectoralis Major Myo-cutaneous Flap done over left side.

On the first postoperative day (POD), physiotherapy evaluation was performed, and the patient complained of discomfort, limited movements of the upper extremities, swollen areas of the neck and shoulders, eating difficulties, limited mouth opening, drowsiness, muscle pain.

Following the patient's informed permission, a clinical assessment was carried out. On general examination, the patient was awake, cooperative, and well-oriented in terms of time, place, and person, and was at ease in supine position. The Glass-Gow Coma Scale score was 15. With an abdominothoracic pattern, he had a pulse rate of 78 beats per minute, blood pressure of 122/82 mm Hg, and a respiratory rate of 18 breaths per minute. Pallor, icterus, clubbing, cyanosis was

absent in patient. On inspection, there were no deformities or muscle atrophy, and the scar was approximately 10 cm long with a bandage. On respiratory assessment, patient had mild cough and his chest wall during the nervous system assessment. Heart sounds were normally heard during cardiovascular assessment. On intraoral examination, mouth opening was reduced approximately 7 mm and tenderness was present over left side of mouth.

Timeline:

Patient was operated on 08-09-2021, from the post operative day 1 to day of discharge that is post operative day 7, physiotherapy treatment protocol was given to the patient in hospital phase.

Fig 1. Patient morphology

Diagnostic Assessments:

Table 1. Musculoskeletal examination of patient:

Variable	Movement	Post operative Day 1	
		Right side	Left side
Pain		8/10	
Range of motion (cervical)	1.Fexion	35	30
	2.Extension	30	25
	3.Lateral flexion	30	30
Range of motion (upper limb)	1.Shoulder flexion	135	120
	2.Shoulder extension	45	45
	3. Abduction	90	70
	4. Adduction	30	25
	5. Medial rotation	40	85
	6. Lateral rotation	50	30
Temporomandibular joint (cm)	Mouth opening	2	
Manual Muscle Testing (MMT)	1. Cervical flexors	2/5	2/5
	2. Cervical extensors	2/5	2/5
	3. Side flexors	3/5	2/5
	4. Shoulder flexors	3/5	2/5

	5. Shoulder extensors	3/5	2/5
	6. Abductors	3/5	2/5
	7. Adductors	3/5	2/5
	8. Medial rotators	2/5	2/5
	9. Lateral rotators	2/5	2/5

Therapeutic Interventions :

Education of patient regarding his post operative condition is the main short-term goal of physiotherapy management. Patient education can assist clinicians in informing and reminding patients about how to properly self-manage their treatment and avoid unnecessary rehospitalizations. The goals of physiotherapy management also include, pain relief, improving the mouth opening, increasing movement of cervical and shoulder joint. For enhancing the quality of life, increasing and regaining the strength of muscles are all includes in physiotherapy rehabilitation of patient.

Treatment Protocol:

1. WEEK 1:
    - Day 1:
      Chest physiotherapy: deep breathing exercises 10 repetitions 1 set
      Bed side mobility
      ROM: Mouth opening and closing exercises
      Cervical ROM exercises
      Active assisted shoulder exercises
      (10 repetitions 3 sets)
      Strength: Toe curls
      Ankle toe movements
      Heel slides
      Ball squeeze
      10 repititions 3 sets

- Day 2:

  Chest Physiotherapy: Deep breathing exercises

  Bed side mobility including supported sitting and standing

  ROM: Mouth opening and closing exercises

  Cervical ROM exercises

  Active assisted shoulder exercises

  (10 repititions 3 sets)

  Strength : Toe curls

  Ankle toe movements

  Heel slides

  Ball squeeze

  (10 repititions 3 sets)

- Day 3:

  Chest Physiotherapy: Deep breathing exercises

  Bed side mobility including standing without support and ambulation

  ROM: Mouth opening and closing exercises

  Cervical ROM exercises

  Active assisted shoulder exercises

  (10 repitations 3 sets)

  Strength : Toe curls

  Ankle toe movements

  Heel slides

  Ball squeeze

  (10 repititions 3 sets)

- Day 4:

  Chest Physiotherapy: Deep breathing exercises

  ROM: Mouth opening and closing exercises

  Cervical ROM exercises

  Active assisted shoulder exercises

(10 repitations 3 sets)

Strength: Toe curls

Ankle toe movements

Heel slides

Ball squeeze

(10 repitations 3 sets)

- Day 5:

Chest Physiotherapy: Deep breathing exercises

ROM: Mouth opening and closing exercises

Cervical ROM exercises

Active assisted shoulder exercises

(10 repitations 3 sets)

Strength: Toe curls

Ankle toe movements

Heel slides

Ball squeeze

(10 repititions 3 sets)

- Day 6:

Chest Physiotherapy: Deep breathing exercises

ROM: Mouth opening and closing exercises

Cervical ROM exercises

Active assisted shoulder exercises

(10 repitations 3 sets)

Strength: Toe curls

Ankle toe movements

Heel slides

Ball squeeze

(10 repititions 3 sets)

- Day 7:

Chest Physiotherapy: Deep breathing exercises

ROM: Mouth opening and closing exercises

Cervical ROM exercises

Active assisted shoulder exercises

(10 repitations 3 sets)

Strength: Toe curls

Ankle toe movements

Heel slides

Ball squeeze

(10 repititions 3 sets)

2. WEEK 2:

   Neck isometric exercises

   Mouth opening exercises (use of bunch of 7 ice-cream sticks)

   Remaining treatment protocol is same as week 1

3. WEEK 3:

   Neck resisted exercises

   Mouth opening exercises (use of bunch of 10 ice-cream sticks)

   Remaining treatment protocol is same as week 1

4. WEEK 4:

   Neck resisted exercises

   Mouth opening exercises (use of bunch of 15 ice-cream sticks)

   Remaining treatment protocol is same as week 1

RESULT:

Table 2. There is significant increase in mouth opening, ROM of cervical and shoulder joint in patient undergoing physiotherapy treatment.

Variable	Movement	Pre-treatment Day 1		Post-treatment Day 7	
		Right side	Left side	Right side	Left side
Pain		8/10		3/10	
Range of motion (cervical)	1.Fexion 2.Extension 3.Lateral flexion	35 30 30	30 25 30	70 80 48	65 80 45
Range of motion (upper limb)	1.Shoulder flexion 2.Shoulder extension 3. Abduction 4. Adduction 5. Medial rotation 6. Lateral rotation	135 45 90 30 40 50	120 45 70 25 85 30	160 70 130 35 70 60	155 70 90 30 90 45
Temporomandibular joint (cm)	Mouth opening	2		4.5	
Manual Muscle Testing (MMT)	1. Cervical flexors 2. Cervical extensors 3. Side flexors 4. Shoulder flexors 5. Shoulder extensors 6. Abductors 7. Adductors	2/5 2/5 3/5 3/5 3/5 3/5 3/5	2/5 2/5 2/5 2/5 2/5 2/5 2/5	3/5 3/5 3/5 3/5 3/5 3/5 3/5	3/5 3/5 3/5 3/5 3/5 3/5 3/5

	8. Medial rotators 9. Lateral rotators	2/5 2/5	2/5 2/5	3/5 3/5	3/5 3/5

DISCUSSION:

This case report details the patient's entire physical rehabilitation requirements after undergoing surgery for buccal mucosa carcinoma of squamous cell which includes composite resection of lesion, segmental mandibulectomy, MRND of left side and reconstruction under PMMC flap. Survivors with cancer face a high rate of morbidity due to different therapies including surgery radiation and chemotherapy. Positive outcomes from rehabilitation after surgical activities have been reported, suggesting that they enhance the standard of living in these patients. The findings of this study revealed improvements in mouth range of motion using Thera-bite range of motion scale, shoulder and cervical movement using goniometer, and strength of muscles using manual muscle testing.(7) Post operative physiotherapy treatment also improves the standard of living of patient, this has been assess by quality of life scale. The QOLS was initially a 15-item questionnaire that assessed five different aspects of standard of living: interpersonal connections, material and physical well-being, interpersonal connections, social, communal, and civic engagement, personal development and fulfilment, and enjoyment .(8)

Physical therapy has been found to promote physical and functional well-being by relaxing muscles, developing joint flexibility, reducing tiredness, increasing awareness of changed posture, walking, and breathing patterns, managing problems swallowing and mouth opening, and so on. used difficulty in eating and talking. (9)(10) In palliative care, the therapeutic consequences of physiotherapy treatment techniques to reduce cancer pain have been thoroughly established. Physiotherapy for the chest, muscle stretching, and mobility exercises have been identified as the most effective rehabilitation approaches.(11) Multidisciplinary rehabilitation including physiotherapy should be considered an

intrinsic element of the whole care of cancer survivors for reducing further complications and improving quality of life of patient

CONCLUSION:

The value of a well-designed physiotherapy management during the inpatient phase and follow up for buccal mucosa carcinoma postoperative patients in terms of pain reduction, progress in upper limb and cervical movement, mouth movements are highlighted in this case study. Because of the risk of recurrence during the remission of long-term health difficulties, postoperative consequences associated to carcinomas and its therapies, such as surgery and chemotherapy, must be addressed. However, clinical studies in a comparable clinical setting employing a similar therapist-designed procedure might support the findings of the investigation.

Reference:

1. Pattanshetty R, Mathias OD. Postoperative physiotherapy management for complications related to cancer of buccal mucosa (head and neck cancer). Indian J Phys Ther Res. 2019 Jul 1;1(2):126.

2. PIRES FR, RAMOS AB, de OLIVEIRA JBC, TAVARES AS, da LUZ PSR, dos SANTOS TCRB. Oral squamous cell carcinoma: clinicopathological features from 346 cases from a single Oral Pathology service during an 8-year period. J Appl Oral Sci. 2013;21(5):460–7.

3. Squamous cell carcinoma of the buccal mucosa: Analysis of clinical presentation, outcome and prognostic factors [Internet]. [cited 2021 Nov 15]. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3915914/

4. Ren Z-H, Gong Z-J, Wu H-J. Unit resection of buccal squamous cell carcinoma: Description of a new surgical technique. Oncotarget. 2016 Dec 25;8(32):52420–31.

5. Abboud WA, Hassin-Baer S, Alon EE, Gluck I, Dobriyan A, Amit U, et al. Restricted Mouth Opening in Head and Neck Cancer: Etiology, Prevention, and Treatment. JCO Oncol Pract. 2020 Oct 1;16(10):643–53.

6. Hsiang C-C, Chen AW-G, Chen C-H, Chen M-K. Early Postoperative Oral Exercise Improves Swallowing Function Among Patients With Oral Cavity Cancer: A Randomized Controlled Trial. Ear Nose Throat J. 2019 Jul;98(6):E73–80.

7. Figure 5 TheraBite range-of-motion (ROM) scale. When measuring mouth... [Internet]. ResearchGate. [cited 2021 Nov 21]. Available from: https://www.researchgate.net/figure/TheraBite-range-of-motion-ROM-scale-When-measuring-mouth-opening-the-notch-at-the_fig5_263517592

8. Burckhardt CS, Anderson KL. The Quality of Life Scale (QOLS): Reliability, Validity, and Utilization. Health Qual Life Outcomes. 2003 Oct 23;1:60.

9. Article Detail [Internet]. International Journal of Advanced Research. [cited 2021 Nov 15]. Available from: https://www.journalijar.com/article/

10. Rigshospitalet, Denmark. Physiotherapy Versus no Physiotherapy to Patients Suffering From Head and Neck Cancer Undergoing Radiotherapy Treatment [Internet]. clinicaltrials.gov; 2013 Jul [cited 2021 Nov 14]. Report No.: NCT00780312. Available from: https://clinicaltrials.gov/ct2/show/NCT00780312

11. Sugita K, Mori Y, Kanemoto K, Sugita S. Physiotherapy and Head and Neck Cancers. J Nov Physiother [Internet]. 2017 [cited 2021 Nov 15];07(02). Available from: https://www.omicsgroup.org/journals/physiotherapy-and-head-and-neck-cancers-2165-7025-1000337.php?aid=85562