The untold stories of cancer survivors: A case series

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Abstract:

The prevalence of oral cancer is high in India due to heavy tobacco consumption. Globally, it is the sixth most common cancer, but in India it ranks in the top three. Treatment generally comprises of combinations of surgery, radiotherapy and chemotherapy. The five year survival rate is at 50% and the survival comes with its own set of complications, attributed to both the condition and the treatment modalities used which can impair the quality of life. Disfigurement, speech impairment, difficulty in mastication, loss of soft tissue and bony architecture are common complications of surgical management. Radiotherapy commonly results in radiation mucositis, radiation dermatitis, xerostomia, radiation caries. Any trauma after radiotherapy can result in osteoradionecrosis. Chemotherapy treated patients suffer from altered taste sensation, immunosuppression, hair loss, mucositis, candidiasis, etc. This presentation includes a series of cases of such complications in cancer survivors focusing on the clinical features and management.

Introduction :

According to the International Classification of Diseases (ICD) Coding scheme, oral cancer has been defined as the cancer of lips and oral cavity.[1,2] The mainstay treatment for oral cancer involves surgery with/without adjuvant radiation and chemotherapy. The intent of surgical management is to remove the cancerous tissue with histologically normal margins while attempting to preserve normal anatomy and function. Radiotherapy and chemotherapy deals with the destruction of the dividing cancer cells to manage the locoregional spread and metastasis.[3] With the progress and recent research (Improved reconstruction procedures, Intensity guided radiotherapy [IGRT], Intensity modulated radiotherapy [IMRT], altered fractionization, neoadjuvant chemotherapy and targeted therapies)[4] in the field of cancer care, the long term survival of patients has increased, particularly for early cases.[3,5] However, the cancer survivors after battling this deadly disease, are presented with other hurdles, namely the impact of the disease and the complications caused by the treatment modalities used.[6] These adverse effects include an influence on the physical appearance as well as basic daily activities of human life such as eating, drinking and speaking and the patients need to learn to adapt to the effect of these on their everyday lives.[6] Thus, these complications not only have physical effects but also impact psychological and social life of the individuals and significantly impair the quality of life of individuals.[3,4] Hence, the aim of this case series is to highlight the various morbidities in post cancer patients which impair the quality of life these patients. In this review, through seven cases, a total of ten such complications have been highlighted and discussed among the post cancer treatment patients.

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Case 1

A 67 year old male patient with reported with the complaint of difficulty in intake of food and water. Patient had h/o of tobacco chewing and bidi smoking since 40 years and was diagnosed with well differentiated squamous cell carcinoma on the right maxillary alveolus involving the hard palate and infiltrating into the maxillary bone 1 year back and the treatment for the same consisted of right partial inferior maxillectomy with adjuvant radiotherapy. The radiation therapy included a total dose of 60 Gy divided into 30 fractions was given to the face and neck. Examination showed presence of an oro-antral communication (Figure 1) in the right maxilla. There was also fibrosis of the buccal mucosa resulting in trismus and dryness of mouth noted, all of which impacted his masticatory abilities. Based on the history and clinical examination, the fibrosis and xerostomia noted was determined to be the deterministic effect of the radiotherapy which patient had underwent as a protocol for treatment of oral cancer and the surgical removal of the cancerous growth resulted in loss of soft tissue and bony architecture of the right maxilla resulting in the present oro-antral communication. Treatment advocated for the patient included prosthetic rehabilitation and salivary substitutes.

Case 2

A 49 year old male presented with the complaint of difficulty in mastication. He was diagnosed with squamous cell carcinoma of the lower lip two years back and was treated for the same with surgical removal and adjuvant radiotherapy. A total dose of 60 Gy divided into 30 fractions was given following the surgical removal. One month ago, he underwent total extraction of the mandibular arch. On examination, disfigurement of face due to the surgical defect (Figure 2) over the lip was noted. Intraoral examination revealed fibrosis of the buccal mucosa, dryness of mouth, multiple carious teeth involving the smooth surfaces suggestive of radiation caries and secondary oral candidiasis. Also, there was presence of exposed, non-tender, necrotic bone over the mandibular arch bilaterally suggestive of osteoradionecrosis. Orthopantogram(OPG) showed presence of altered bony

trabecular pattern in the mandibular arch. Loss of soft tissue followed by healing by scarring resulted in disfigurement of face after surgical removal. Radiation caries and secondary oral candidiasis could be attributed to the salivary dysfunction caused by radiation therapy. The treatment constituted of topical antifungals, saliva substitutes, surgical removal of sequestrum followed by prosthetic rehabilitation and restorative and preventive measure for the carious teeth.

Case 3

A 61 year old female reported with the complaint of pain and burning sensation over the left buccal mucosa and tongue since 15 days. Patient had h/o of tobacco chewing since 15 years and was diagnosed with moderately differentiated squamous cell carcinoma of the left mandibular alveolobuccal complex three months back. Her treatment included left marginal mandibulectomy with left modified radical neck dissection followed by adjuvant radiotherapy given in 30 fractions with a total dose of 60 Gy. She was also on medication for hypertension. Examination revealed that the skin of the left side of the face and neck was dry, flaky and discoloured suggestive of radiation dermatitis (Figure 3). Introrally, the left buccal mucosa and tongue demonstrated erythema and multiple ulcerations suggestive of radiation mucositis (Figure 4). Also, saliva was thick and stringy and candidal infection (Figure 5) was noted on the palate which could be attributed to salivary dysfunction caused by adjuvant radiotherapy. Benzydamine mouthwash and topical antifungal was given to counteract the burning sensation and a moisturiser was opted for radiation dermatitis.

Case 4

A 57 year old male reported with a complaint of a growth over the mandibular anterior region. He gave h/o of pan chewing habit since 14 years and also, h/o of carcinoma of lower lip treated with surgery and radiotherapy five years back. Disfigurement of face due to surgical scar over the lower lip was seen. Intraoral examination revealed an ulceroproliferative growth with granular surface and rounded, indurated margins over the right mandibular alveolar region. Mobility of mandibular anteriors and right first molar was noted. Xerostomia, radiation fibrosis (Figure 6) resulting in trismus and restricted movement of the tongue was also noted, all of which could be attributed to previous radiotherapy. OPG demonstrated an osteolytic lesion with irregular borders suggestive of malignancy. An oncologist referral was advocated in view of suspected recurrence of the malignancy.

Case 5

A 72 year old male reported with complaint of pain and discharge from the right mental region since 3-4 months. He was diagnosed with grade two oral squamous cell carcinoma of the base of the tongue 4 years back. Patient underwent surgical excision with adjuvant chemotherapy (Inj Paclitaxel and Inj Carboplatin; 2 cycles and Inj Cisplatin weekly for five weeks) and adjuvant radiotherapy (A total of 66 Gy divided over 33 fractions). Past medical history included hypertension and was under medication. Patient had habit of bidi smoking which he had discontinued only 4-5 months ago. He also gave h/o of multiple extractions 1 year back. Examination revealed extraoral draining sinus with pus discharge. Intraorally, exposed, discoloured, necrotic bone (Figure 7) was noted on both the arches bilaterally. Xerostomia and altered taste sensation was also noted which could be attributed to chemoradiation. OPG showed altered trabecular pattern of both maxillary and mandibular bone. A diagnosis of osteoradionecrosis was given based on its history, clinical and radiological findings. Treatment involved saliva substitutes, antibiotic therapy, sequestrectomy and hyperbaric oxygen therapy.

Case 6

A 53 year old female patient reported with the complaint of difficulty in mastication. Patient had a habit of mishri application since 15 years but had discontinued the same one year ago. She was diagnosed with carcinoma of the floor of the mouth 1 year back and was treated with surgical excision and radiation therapy which involved a total of 60 Gy divided in 30 fractions to the tongue and 46 Gy divided in 23 fractions to the bilateral lymph nodes with intensity modulated radiotherapy (IMRT). Examination revealed multiple carious teeth with involvement of smooth surfaces, inflamed oral mucosa, depapillation of tongue, reduced salivary flow and angular cheilitis bilaterally. Apple core appearance of the teeth was noted in radiograph. Based on history, clinical and radiographical findings a diagnosis of radiation caries was given. Salivary dysfunction due to radiotherapy resulted in reduced salivary flow, in turn reducing the cleansing and protective effects of saliva resulting in increased incidence of caries. Treatment advocated included endodontic and restorative management of the caries teeth with topical antifungals and salivary substitutes.

Case 7

A 42 year old female patient reported with complaint of pain with right back region of the upper jaw since 2 days and difficulty in mastication. Patient had habit of mishri application since 10 years but discontinued the same 6 years back. She was diagnosed with carcinoma of left buccal mucosa and operated for the same 8-9 months ago. Her treatment included wide buccal excision with marginal mandibulectomy and supraomohyoid neck dissection and reconstruction with the help of left medial sural artery perforator (MSAP) flap followed by radiotherapy. On examination, surgical scar was noted over the left half of the face extending from the lower lip till the left side of the neck. The skin on the left side of the face and neck was discoloured, dry and cracking as compared to the right suggestive of after effects of radiotherapy. Fissuring of the corners of the mouth suggestive of angular cheilitis. Intraorally, occlusal caries were noted with right maxillary first molar and second premolar. There was significant reduction in the mouth opening and salivary flow. There were multiple missing mandibular teeth and complete loss left mandibular alveolar ridge with partial loss of right mandibular alveolar ridge. To overcome the loss of soft tissue architecture due to surgical removal, a skin graft was placed over the left buccal mucosa and lower lip. Surgical scar was also noted over the donor

site. Treatment advocated for the patient included proper dietary and oral hygiene counselling salivary substitutes, topical antifungals, restoration of the carious teeth, fluoride treatment.

Discussion :

Various adverse effects have commonly been found in patients surgery and post chemoradiotherapy.[7] In this case series, complications identified included disfigurement, loss of soft tissue and bony architecture, xerostomia, radiation mucositis, radiation dermatitis, radiation fibrosis, radiation caries, osteoradionecrosis, altered taste sensation and candidiasis. Most of these patients presented with difficulty in regular intake of sustenance, a basic endeavour of human life. The loss of cleansing and buffering action of saliva due to reduced salivary secretion as a result of salivary gland dysfunction, a deleterious effect of radiotherapy, predisposed the individuals to a higher risk of caries and could result in tooth loss, xerostomia in turn could cause inflammation of the oral mucosa and an increased risk of fungal infections, trismus and restricted movements of tongue noted due to fibrosis, all of which cause the difficulty in mastication and might also affect speech. Also, patients with disfigurement tended to face social stigma requiring them to cover their face in public for a significant time period of their lives causing psychological distress. All this in turn could affect their work as well as personal relationships.[4] Other than the ones above mentioned, there are various other complications have also been associated with treatment modalities used for oral cancer and summary of the overall complications of surgery, radiotherapy and chemotherapy associated with post cancer patients has been given in tables 1,2 and 3 respectively.[7-13] All of these complications have deleterious effect on the physical and psychological well-being of the individuals. Depression has been commonly noted in head and neck cancer patients.[4] Thus, the quality of life was advocated as an end point of the treatment[4] and emphasis not only on treatment of oral cancer but also on the post treatment life of individuals is important.

Though all these complications cannot be completely avoided, they certainly can be minimized. Early diagnosis of cases could limit the adjuvant therapy, in turn reducing the deleterious effects. In this, the oral physician plays an important role, as just a conventional examination of the oral cavity might be able to give an indication of the disease and also, premalignant lesions could be easily identified due to their discrete clinical features.[14] This would not only reduce the morbidity of the condition and its treatment, but also the economic burden on the individual. Early dental care and dietary and oral hygiene counselling were considered imperative to circumvent the post-operative complications.[9] During radiotherapy the tumour sensitivity could be increased, in turn protecting the normal cells by the use of radioprotectors, radiosensitizers and radiation mitigators, thus in turn reducing the dosage and duration of radiotherapy in turn sparing the adjacent normal tissue from damage resulting in reduction of radiotherapy associated effects (Table 4).[15] Intensity modulated radiotherapy(IMRT) and Image-guided radiotherapy(IGRT) are also used to limit the damage to the normal tissues.[16] Pentoxifylline and Vit E were considered for prevention of radiation fibrosis but there was no significant level of evidence for the same.[9] Increasing awareness among the population, especially the low socio-economic groups, about the clinical symptoms, self-examination and tobacco counselling might assist in early diagnosis as well limit the number of cases.[14]

Conclusion

This case series presented the various detrimental effects noted in post cancer patients. Surgery, radiotherapy and chemotherapy are the basic treatment modalities used for cancer patients and are known to give rise to various post-operative complications. This case series presented some of the various detrimental effects commonly noted in oral cancer patients post treatment and also ways to reduce or prevent these complications were discussed as a means to improving the quality of life of individuals.

Figure 1: Oroantral communication over the right maxillary region (Patient treated with surgery+radiotherapy for carcinoma of right maxillary alveolus) {Case 1}

Figure 2: Surgical defect after surgical removal of carcinoma of lip {Case 2}

Figure 3: Radiation dermatitis: Dryness and desquamation of the skin noted with pigmentation. {Case 3}

Figure 4: Radiation mucositis: Erythema and ulcerations noted over the buccal mucosa and tongue. {Case 3}

Figure 5: A post treatment patient of oral cancer demonstrated secondary oral candidiasis of the palate {Case 3}

Figure 6: Fibrosis of the left buccal mucosa with a surgical defect noted in a cancer patient post radiotherapy {Case 4}

Figure 7: Osteoradionecrosis: Exposed, necrotic bone over the mandible {Case 5}

Table 1: Surgical complications post cancer patients

Sr no	Complications
1.	Disfigurement due to scarring
2.	Loss of soft tissue and bony architecture

Table 2: Overall complications due to radiotherapy in post cancer patients

Complication	Mechanism	Clinical findings	Management
Radiation Dermatitis	Radiation exposure, either by direct or indirect effects[7] damages the basal epithelial cell layer of the skin. Inflammation and vascular response give rise to erythema. There is increased deposition of melanin by melanocytes and once the subdermal lymphatics become exposed, it results in moist desquamation and at higher doses, necrosis.[8]	Early (within 10 weeks): Erythema, hyperpigmentation, epilation and desquamation. Dry desquamation occur after 45 Gy whereas 50-60 Gy might give give rise to moist desquamation. Late (after 10 weeks): Xerosis, atrophy, telangiectasia, subcutaneous fibrosis, and necrosis.[8]	Keeping skin clean and dry. Maintain skin hydration through the use of moisturizers, barrier creams, aloe vera, lanolin, and steroid creams as it maintains the epithelization. Dressing might be required to prevent infection and maintain hydration in moist desqamation.[8]
Mucositis	Radiation affects the rapidly dividing basal cells oral mucous membrane[7]	Redness and inflammation are noted at the end of second week of therapy, followed by formation pseudomembrane and ulcerations.[7]	It is majorly symptomatic. Pain control by 0.2% morphine mouthwash, benzydamine mouth wash, etc. has been advocated Zinc supplements have been found to be assist in these patients.[9]
Candidiasis	Radiation causes alteration of the oral environment predisposing towards the growth of candida species. Also, xerostomia due to affected salivary gland function reduce the cleansing and protective effects of saliva. [10]	Symptoms tend to vary ranging from no symptoms to burning sensitivity and pain. White pseudomembranous coating of candida might be noted, along with odynophagia, dysgeusia.[9]	Topical antifungals. Severe cases might require systemic antifungals.[9]
Loss of taste	Destruction of the taste buds due to radiation[7]	Generally occurs in the second to third week. Is reversible and recover after 60-120 days.[7]	
Salivary gland dysfunction	Radiation exposure causes inflammation, destruction of acini and ducts, followed by marked fibrosis.[7]	Thick, stringy saliva Xerostomia	Artificial saliva substitutes. Sialagogues.[9]
Radiation caries	Reduced flow, decreased pH, reduced buffering capacity, increased viscosity of saliva and altered flora predispose patients to develop this rampant form of dental decay.[7]	Type 1: Involvement of the cementum and dentin at the cervical region and extends circumferentially. Type 2: Involves all the surfaces. Type 3: Dark brown-black colour changes seen in the crown.[11]	Dietary and oral hygiene counselling. Topical fluoride application. Use of sialogogues to increase the salivary flow. Artificial saliva substitutes.[9]

Complication	Mechanism	Clinical findings	Management
Radiation fibrosis	Radiation causes tissue damage resulting in inflammation, differentiation of fibroblast to myofibroblasts, which produce excess collagen and extracellular matrix, resulting in fibrosis.[12]	Trismus Restricted tongue and lip function	Stretching exercises for the muscles of mastication. Pentoxifylline and Vit E are said to reduce the incidence.[9]
Osteoradionecr -osis (ORN)	Radiation tends to make the bone hypocellular, hypovascular, hypoxic, hypomineralized and making it susceptible to infection.The triad of Trauma+infection +radiation therapy results in ORN.[7]	More common in mandible Exposed necrotic bone h/o trauma	Hyperbaric oxygen therapy (HBO). Sequestrectomy. Prevention: Dental care before radiation therapy. Oral hygiene and dietary counselling.[9]

Table 3: Oral complications associated with chemotherapy[13]

Sr no	Complication
1	Altered taste sensation
2	Mucositis
3	Dysgeusia or ageusia
4	Salivary gland dysfunction
5	Predisposition to viral, bacterial and fungal infections
6	Dysphagia
7	Osteonecrosis

Table 4: Radiosensitizers, Radioprotectors and Radiation mitigators[15]

Radiosensitizers	Radioprotectors	Radiation mitigators
Sensitize tumor cells to radiation e.g.:Hyperbaric oxygen Carbogen Nicotinamide	Reduce damage in normal tissues e.g.:Amifostine Nitroxides (tempol) Anti-oxidants (glutathione, lipoic acid)	Minimize toxicity after radiation e.g.:Palifermin Halofuginone

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