CASE REPORT

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Salvage Mandibulectomy in an Octogenarian with Recurrent Oral Cavity Squamous Cell Carcinoma: A Case Report

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ABSTRACT

Oral squamous cell carcinoma (OSCC) is the commonest malignant tumour affecting the oral cavity with a poor 5-year disease free survival. We present an octogenarian with a recurrent oral cavity squamous cell carcinoma, treated with salvage mandibulectomy without bony reconstruction. No immediate or intermediate perioperative complications were documented. Subsequent monthly surveillance clinical examination, endoscopy and computed tomography at six months post-operative showed no evidence of residual tumour. Geriatric syndrome, perioperative risk and oncologic stratification are three main cornerstones in evaluating feasibility of oncologic surgery in an elderly patient. A multidisciplinary approach allowed surgical extirpation of OSCC with a good outcome.

Keywords: *Elderly; geriatric; head and neck squamous cell carcinoma; oncology surgery; oral squamous cell carcinoma*

INTRODUCTION

Oral squamous cell carcinoma (OSCC) constitutes more than 90% of all oral cavity malignancies, causing an estimated 177,000 reported global deaths every year (Sung *et al.*, 2021). This aggressive cancer has a 5-year overall survival rate of 39%, which further reduces in advanced stages (Ferreira *et al.*, 2021). Clinically, affected patients present with multiple speech, swallowing and breathing difficulties associated with high incidences of nodal metastasis. Mandibular medullary bony invasion occurs in 32% of OSCC patients undergoing primary surgery and is an independent predictor of overall survival (Fives *et al.*, 2017). The current standard treatment for OSCC should be surgery with or without adjuvant therapy. The indication of adjuvant therapy (either radiotherapy or chemotherapy) is dependent on features detailed in the histopathological report of the resection, which includes histological grading, growth pattern, depth of invasion, status of margin, vascular/neural invasion, bone involvement, nodal status

(number and size of lymph nodes involved, extranodal extension) and pathological tumour, nodes, metastases (TNM) staging (Zanoni *et al.*, 2019). Following a multimodality treatment, more than half of the patients develop recurrence, which carries the poorest prognosis compared to other sites of head and neck (Ferreira *et al.*, 2021).

Best survival benefits have been described with salvage tumour resection with adequate margins (Shetty *et al.*, 2022). While this is technically feasible, such aggressive management poses a significant anaesthetic and surgical risks in an octogenarian with multiple comorbidities. Following removal of malignant invasion of the mandible, bony reconstruction utilising a fibula-free flap is regarded as the best reconstructive strategy. The additional two to four hours of surgery, though, may result in considerable hemodynamic alterations and raise the chance of intraoperative complications, particularly coronary artery disease and cerebrovascular accident. We hereby report an elderly gentleman with non-insulin-dependent diabetes mellitus, dyslipidaemia, hypertension, and chronic renal failure who had good locoregional control and functional outcome following salvage mandibulectomy without bony reconstruction in a recurrent oral cavity squamous cell carcinoma. The perioperative objectives in this complicated case included preventing hypoglycemia, closely monitoring body fluids while maintaining good urine output, minimising variations in hemodynamic markers, and preventing surgical site infection. The use of risk stratification to identify elderly surgical candidates and the perioperative methods used in this instance to accomplish these objectives are covered in depth.

CASE REPORT

An 83-year-old male with underlying non-insulin dependent diabetes mellitus, dyslipidaemia, hypertension and chronic renal failure presented with a two-month history of rapidly enlarging right mandibular swelling. He gives a history of T2N0M0 left lateral border tongue squamous cell carcinoma treated with combination hemiglossectomy, left supraomohyoid neck dissection and adjuvant brachytherapy, completed treatment a year ago. The pathological findings of the first surgery confirmed a T2N0M0 disease with a close resection margin at the tongue and no other negative prognostic factors. He then developed a painless right Level 2 neck swelling seven months after, where a right Type III modified radical neck dissection was performed in another centre, with no adjuvant therapy given. The mandibular swelling has caused some limitation in articulation of speech with no issues in mouth opening, chewing or swallowing. Two weeks prior to his presentation, the skin on his right mandibular region started to ulcerate, and this was accompanied by occasional pain. Otherwise, he has no aspiration, hoarseness, or symptoms to suggest regional or distant metastasis.

Examination revealed a medium-built elderly male with stable vital signs. He was orientated to time, place, and person and the Mini-Cog test revealed a normal screen for dementia. A fungating, hard, and fixed mass with central ulceration was palpable at the right body of the mandible and its posterior border reaching the right angle of mandible, measuring 6 cm × 5 cm (Fig. 1). Medially, the mass encroaches into the right angle of the mouth and inferiorly up to Level II of the neck. No other palpable lymphadenopathies were present underneath well-healed neck incisions on either side of the neck. Oral cavity examination showed reduced tongue bulk on the left side with normal tongue mobility. No mass or ulcer was seen on careful inspection and palpation of the tongue and oral cavity. Lung examination was unremarkable and no hepatomegaly was present.

Fig. 1 Lateral facial profile showing a mass at the right mandible with central ulceration (white arrows) surrounded by indurated skin.

A positron emission tomography scan was performed showing a hypermetabolic subcutaneous soft tissue mass over the right mandible (Fig. 2) with no regional or distant metastatic disease. Magnetic resonance imaging was performed concluding marrow infiltration of the adjacent mandible (Fig. 3). A multidisciplinary team meeting consisting of a radiologist, radiation oncologist, head and neck surgeon, maxillofacial surgeon, anaesthetist, and an intensivist concluded a surgically resectable disease with high risk of reirradiation. Considering the multiple comorbidities, a decision to embark on a salvage mandibulectomy without reconstruction was arrived at to reduce the operative morbidities of long-hour surgery. A thorough discussion of the expected functional deficits in chewing and swallowing was discussed with the patient and family prior to the surgery.

Intraoperatively, he was induced with intravenous boluses of propofol 1.5 mg/kg, fentanyl 100 µg and rocuronium 0.6 mg/kg. Administration of intravenous fluids were guided by hourly urine output monitoring and cardiovascular status. Maintenance of anaesthesia was achieved by a combination of inhalational and intravenous agents. A segmental resection of the mandible was performed en bloc with resection of the tumour (Figs. 4A and B), leaving a bony defect at the mandible, which was left unreconstructed (Fig. 5).

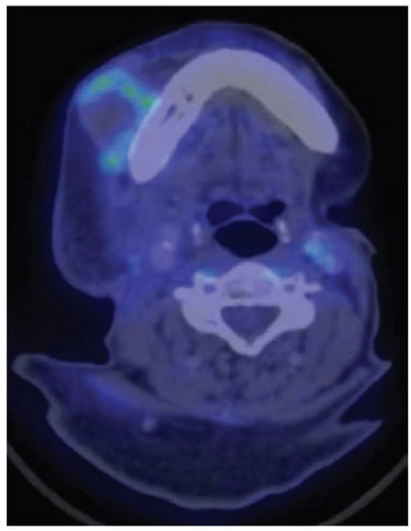

Fig. 2 Corresponding axial section of the PET-CT demonstrating a hypermetabolic mass adjacent to the right mandible.

Fig. 3 Coronal section of the T2-weighted magnetic resonance imaging showing hypodense lesions within the marrow of the right mandible, suggestive of infiltration (white arrow).

Soft tissue reconstruction was achieved using a pectoralis major myocutaneous flap, taken from the right side (Fig. 6). Total operative time was 3 hours 40 minutes with intraoperative blood loss of 500 ml. No perioperative blood transfusion was required. A temporary tracheostomy was performed, and subsequently decannulated at postoperative day five, upon establishment

of cutaneous wound healing. Immediate post-operative care took place in the intensive care unit before the patient was weaned off ventilation 12 hours following the procedure. Subsequent postoperative care took place in a surgical ward. The patient was prescribed breathing exercises, chest and limb physiotherapy as well as compression stockings. Ambulation using four-legged crutches was established on postoperative day four. The patient successfully established peroral feeding with a soft diet at postoperative one week before he was discharged home. He maintained a stable weight under close supervision and dietary intervention. The patient did not develop any major complications in the immediate and intermediate periods following the surgery. Histopathological examination of the resected tumour confirmed a moderately differentiated squamous cell carcinoma with marrow infiltration of the mandible (pT4aN0M0). The tumour margins were more than 5 mm away from the all resected margins. The reconstructed skin and soft tissue showed complete uptake without any wound complications. Subsequent monthly surveillance clinical examination, endoscopy, and computed tomography at six months post-operative showed no evidence of tumour residual. He remained well with good healing and locoregional control at one year post-operative (Fig. 7).

Ethics Statement

All procedures performed on human participant were by the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Written informed consent for publication of clinical details images was obtained from the patient.

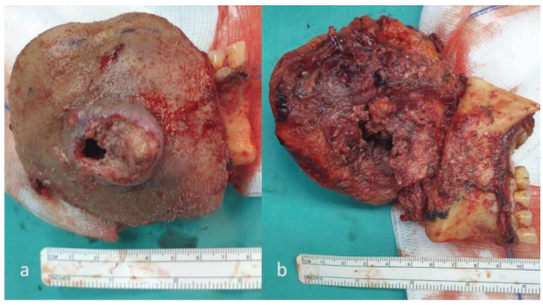

Fig. 4 (A) External and (B) internal views of resected tumour along with the mandible.

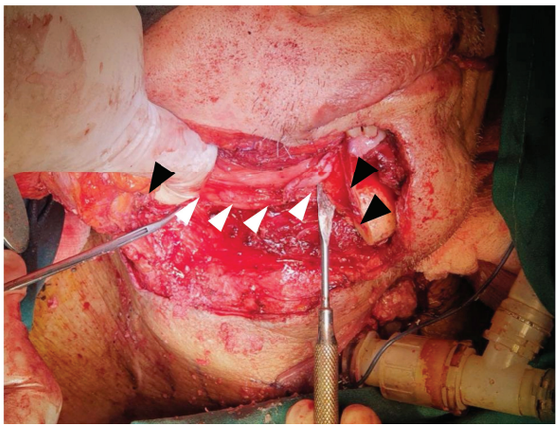

Fig. 5 Lateral view of the surgical bed showing remnant of the mandible (black arrowheads) and preserved buccal mucosa (white arrowheads).

Fig. 6 Skin and soft tissue reconstruction of the resected tumour with a right pectoralis major myocutaneous flap.

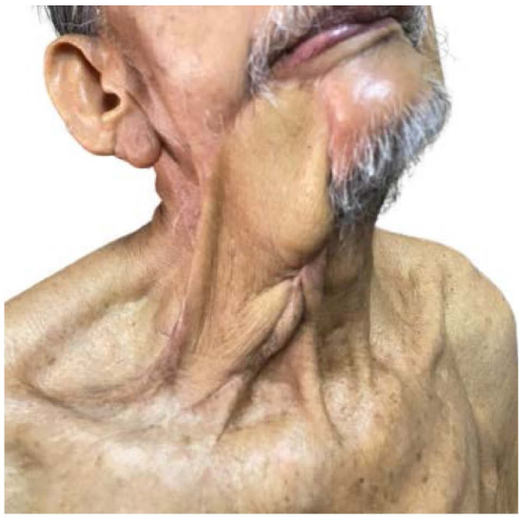

Fig. 7 Lateral profile of the lower face and neck at one year follow up showing good healing and locoregional control.

DISCUSSION

The yearly incidence of OSCC among the elderly (more than 75 years old) has seen a steady rise. An epidemiologic study conducted in the Netherlands concluded a significant increase from years 1989 to 2010 with an average annual percentage change of 1.8% (Al-Jamaei *et al.*, 2022). Another study on 1,064 OSCC patients showed a median age of 81 years old with 32.1% of patients aged between the ages of 80 to 84 years old (Li *et al.*, 2021). The occurrence of OSCC among the elderly often poses significant treatment dilemmas as significant systemic cardiovascular, respiratory, metabolic, hepatic, and renal morbidities may coexist, complicating surgical and oncologic management. Additionally, the functional deficits in cognition and physical status tend to worsen with age. As a result, the rate of curative oncologic surgery in OSCC significantly declines with advancing age (Li *et al.*, 2021).

Solid tumours rarely respond to chemotherapeutic agents making surgical extirpation the superior treatment. Therefore, advanced chronological age should not be the only decisive factor to disavow curative oncologic surgery (Audisio *et al.*, 2004; Korc-Grodzicki *et al.*, 2014). Current recommendations mandate a holistic risk stratification, encompassing geriatric syndromes, perioperative risks, and oncologic stratification before a decision is made to embark on cancer surgery for a potentially vulnerable elderly (Korc-Grodzicki *et al.*, 2014). The geriatric syndrome that predicts poor outcomes in cancer patients includes recent falls, cognitive impairment, depression, and malnutrition (Magnuson *et al.*, 2019). Several screening tools may be used to assist clinicians in detecting poor cognitive function and depression. The Mini-Cog is a useful tool that has been shown to have good sensitivity and specificity for identifying dementia (Borson *et al.*, 2003). This test requires the patient to complete a three-word delayed recall and a clock-drawing test within two minutes. The Hospital Anxiety and Depression Scale is another widely used screening tool for detecting depression. A score of six or more would indicate a need for psychological evaluation and intervention (Singer *et al.*, 2009). Frailty measures have also been

described as predictors of perioperative complications in oncologic surgery of the head and neck region. In a prospective study of 274 geriatric patients, a higher frailty score using Fried's Frailty Index and less independence on the Lawton Brody and Barthel Index were predictors of increased length of postoperative hospital stay (Goldstein *et al.*, 2020).

Following a comprehensive risk stratification for perioperative morbidity and mortality, relative to predicted oncologic outcomes, the head and neck surgeon faces further challenges to make the appropriate surgical decisions and establish realistic goals and expectations for the patients and their families. As seen in this case, the extent of surgical resection and type of reconstruction have to be tailored to the risk of complications, the goal of oncologic treatment, and the expected quality of life outcomes. Although reconstruction of the resected mandible in OSCC is usually achieved with a microvascular fibula bone graft followed by dental implants (Fives *et al.*, 2017), the increased length of surgery will eventually cause a higher risk of cardiovascular complications. Additionally, elderly patients especially those on a baseline soft diet from poor or no dentition may not experience an improvement in function from the elaborate reconstructive procedure compared with younger patients (Korc-Grodzicki *et al.*, 2014). Therefore, a much safer and quicker reconstruction to restore cosmesis is a pedicled pectoralis major flap (Korc-Grodzicki *et al.*, 2014). Common perioperative complications that may affect the elderly population with OSCC include delirium, cerebrovascular accident, myocardial infarction, deep vein thrombosis, upper gastrointestinal bleeding, hospital-acquired pneumonia, and wound complications. Specific management described in this report targets these complications including compression stockings, early ambulation, chest, and limb physiotherapy, early weaning off the ventilator, early commencement of oral feeding, and early discharge from the intensive care setting.

The pathologic depth of invasion and extranodal extension are two important prognostic factors in OSCC (Zanoni *et al.*, 2019). Geriatric patients with oral cancer are at increased risk for increased depth of invasion due to age related atrophy of the epithelium and decreased vascularity and elasticity of the oral mucosa. Additionally, the lymphatic vessels in geriatric population may be less effective in transporting lymphatic fluid and immune cells, which can allow tumour cells to escape and spread beyond the lymph node (González-Loyola & Petrova, 2021).

Improved survival outcomes are seen among elderly patients with OSCC who were treated with a surgical intent. Multivariate analysis showed that compared to surgery groups, the hazard ratios for no-surgery groups were significantly higher for overall and cancer-specific survival (Li *et al.*, 2021). As seen in this case, multidimensional risk stratification and optimal perioperative care produced good outcomes in an octogenarian with acceptable morbidity and mortality, compared with their younger counterpart. Therefore, if surgery is determined to be the appropriate treatment modality, patients should not be denied this option because of their chronological age.

CONCLUSION

Geriatric syndrome, perioperative risk, and oncologic stratification are three main cornerstones in evaluating the feasibility of oncologic surgery in an elderly patient. A multidisciplinary approach allows surgical extirpation of OSCC with a good outcome.

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