Acute carotid blowout syndrome (CBS) is the most dreaded complication in an invasive head-and-neck malignancy. The syndrome occurs in 3%–4% of all head-and-neck cancer patients. This report is inquisitive about the effectiveness of preservation of carotid artery during a life-threatening acute carotid blowout in an invasive CBS.

Keywords: Recurrent carotid blowout, recurrent carotid blowout syndrome, Type III carotid blowout syndrome

INTRODUCTION

Carotid blowout syndrome (CBS) is a deadly complication in head-and-neck malignancy. The reported incidence is 3%–4% of all head-and-neck cancers. The proximal part of carotid bifurcation is the most common site of occurrence. This report invites the reader to contemplate on the effectiveness of carotid artery preservation during a life-threatening acute carotid blowout in malignancy.

CASE REPORT

A 61-year-old male presented with large ulcer on the right side of the neck with vanquished superficial tissues (skin, subcutaneous tissue fat, and sternocleidomastoid were absent), strap muscles, and bone with invasion into the carotid sheath. This was diagnosed as basal-cell carcinoma and was treated in the oncology department. The underlying pathology was found to be basal-cell carcinoma of skin. Since the skin and underlying tissue were destroyed, primary radiotherapy for 6 weeks was considered. Total destruction of the anterior carotid sheath was revealed exposing the right carotid artery while on radiotherapy. After three cycles of radiotherapy, he was readmitted for reconstructing the defect with deltopectoral muscle flap. While awaiting surgery, he had an acute blowout of the exposed common carotid artery. Since endovascular stent graft was not available in our center, we planned surgery.

The patient was immediately shifted to the operation theater, with local pressure controlling the bleeder (percutaneous balloon facility for controlling bleeding was unavailable in our hospital). Blood pressure was 60 mmHg (systolic) on table. The patient was intubated with fiberoptic bronchoscopy. With pressure over bleeder by the assistant, the carotid was dissected and controls were taken with vessel loupes, both proximally and distally. Since clinically palpable pulsation was felt on the left side, we could safely snug the loops proximally and distally on the right side after heparinization. A 1.5-mm vertical defect was found over the anterior part of the right carotid artery. Although we had a dilemma over ligation and repair, we opted for a conservative approach and the defect was repaired.

Since the patient was hemodynamically unstable with low BP, a minimal procedure was considered. The small rent was suture closed with 6-0 prolene. Pulsation was felt proximally and distally after closing the defect. Wound flap cover was not considered at the same sitting since his hemoglobin was 5.6 g%. His blood pressures improved to 80 systolic.

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patient was stabilized with multiple blood transfusion. After 2 days, the right deltopectoral flap was used to reconstruct the defect. Immediate postoperative recovery was uneventful. On the 7th postoperative day, the patient developed a swelling under the flap. Since endovascular facilities were absent, the flap was promptly explored and acute blowout was detected near the previously repaired site. Then, the carotid was ligated off. Postprocedure, the patient developed weakness of the left upper arm (power grade was 3), which improved subsequently during his hospital stay. He was discharged on day 14, without any neurological deficits.

**DISCUSSION**

Surgery with en block resection of the involved adjacent structures is the treatment for invasive head-and-neck malignancies with neoadjuvant or adjuvant radiotherapy. CBS occurs with extensive invasion of the carotid sheath by locally invasive malignancies of the head and neck. Other risk factors for CBS in such a setting are following radiotherapy or extensive resection exposing carotids. This is also seen as complication following surgery with flap necrosis, mucocutaneous fistula, wound infection, and recurrent tumor invasion.[2]

In radiation-induced vasculopathy following irradiation for malignancy in the head and neck, free radicals are released causing thrombosis of vasa vasorum, which leads to the breakdown of the carotid artery wall. The patients develop fibrosis and thinning of the carotid arterial wall leading on to blowout.[3] Infecction also leads to thrombosis of the vasa vasorum and arterial wall injury.[2] Incidence of carotid blowout in patients receiving salvage radiotherapy is 10%–17%.[4] Various stages of CBS are as follows: Type I – threatened carotid blowout; Type II – impending carotid artery rupture; Type III – rupture of the carotid artery. Threatened blowout was defined as exposure of the carotid artery because of wound breakdown or as angiographic findings consistent with neoplastic invasion of the carotid system and with nonhemorrhagic pseudoaneurysm. Rupture was almost inevitable if the exposed vessel was not promptly covered with healthy vascularized tissue. Impending carotid blowout consisted of short episodes of acute hemorrhage that resolved spontaneously or with simple surgical packing. The carotid blowout in the current case was due to the tumor invasion by basal-cell carcinoma along with radiation-induced vasculopathy.

Management of CBS depends on the type of presentation and the general condition of the patient. In advanced centers, more than 70% of patients with Type I and Type II CBS are managed with endovascular therapy only (embolization and stenting). However, there is a limited role for endovascular management in an emergent Type III acute blowout. Moreover, stent placement has a higher risk (44%)[5] of recurrent carotid blowout syndrome (rCBS). Surgical repair and ligation are other options.

**Ligation versus repair**

Type III CBS has maximum mortality as death is nearly instantaneous if not managed sensibly. Surgical intervention, either ligation or repair, is the preferred management.

So the question is whether to ligate or repair?

In an emergency situation, carotid artery repair seems to be a logical option, as contralateral carotid is not assessed. Moreover, according to some studies, the probability of neurological morbidity is around 20%–30%, after ligation of the carotid.[5] However, the rationale behind ligation is the increased incidence of rCBS. This is ascribed to the natural progression of disease which is seen in about 65%–70%.[5] rCBS is usually catastrophic, resulting in death especially if the intervention gets delayed due to late arrival in casualty. Furthermore, there are reports, which show no significant difference of stroke between carotid artery ligation and reconstruction.[6,7] Hence, carotid ligation, in an emergency situation as in carotid blowout Type III, can be considered as an admissible lifesaving procedure.

**CONCLUSION**

Considering the mortality risk, for recurrent blowout, in an invasive Type III CBS, ligation of the carotid artery is more acceptable over repair approaches accepting the risk of neurological morbidity.

**Declaration of patient consent**

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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**Conflicts of interest**

There are no conflicts of interest.

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