**Carotid Artery Resection and Reconstruction in Advanced Stage Head and Neck Cancer: Postoperative morbidity in the first 90 days**

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**ABSTRACT**

**Introduction:** Carotid artery involvement in advanced head and neck cancer represents stage IVb disease, and carries a grave prognosis with increased risk of sudden death by arterial wall invasion and resultant carotid blowout. En bloc resection of the tumor and involved carotid artery has been advocated for complete local/regional control and shows a modest survival benefit, but presents the significant risks of postoperative stroke, graft infection and graft blowout. For these reasons, carotid artery resection in head and neck cancer remains controversial. In order to convey the safety of performing such aggressive resections, we report a case series on postoperative outcomes of carotid artery resection and reconstruction for advanced stage disease.

**Methods:** Case series and literature review.

**Case Series:** Two consecutive patients, aged 57 and 78, with carotid involvement from advanced stage head and neck cancers were treated over a 12-month period. The head and neck cancer multidisciplinary team reviewed all cases, and surgical extirpation was recommended. Both patients had T4N3M0 disease with bulky extension to involve the great vessels in the left neck. Squamous cell carcinoma of an unknown primary represented an initial diagnosis in one patient, with the other presenting with a contralateral neck recurrence after undergoing previous neck dissection with postoperative chemoradiation therapy twelve months prior. Both patients underwent composite resection with single-stage carotid resection / reconstruction and myofascial pectoralis flap for coverage.

**Results:** Two patients underwent carotid resection and reconstruction for advanced stage head and neck cancer. All procedures were single stage and there were no immediate or delayed signs of neurological dysfunction. There were no instances of graft failure or infection. Postoperative pain scores relative to preoperative levels showed noted improvements when using a visual analog scale.

**Conclusions:** Carotid resection and reconstruction for advanced stage head and neck cancer is a safe procedure with minimal postoperative morbidity related to neurological impairment and graft failure. Furthermore, noted improvement in postoperative pain was measured, suggesting benefits in quality of life.

**INTRODUCTION**

Resection of the carotid artery as part of treatment for head and neck cancer was first reported by Conley in 1957, with subsequent demonstration of a survival benefit versus non-operative treatments described by Loré and Boulos in 1981. Despite ongoing advances in chemotherapy and radiotherapy, survival rates for patients with stage IV head and neck disease remain extremely poor.

En bloc resection of the tumor and involved carotid artery has been advocated for local/regional control of stage IVb disease, with modest survival benefits. However, significant risks of postoperative stroke, graft infection and blowout have limited the acceptance of carotid artery resection, which remains a controversial procedure within the community of Head and Neck surgeons.

This study reports the early experience of a multidisciplinary team assembled to offer carotid artery resection and single stage reconstruction for patients with advanced head and neck cancer.

**METHODS**

Identified patients with advanced head and neck disease with radiographic evidence of potential carotid artery involvement were presented to the multidisciplinary tumor board, with subsequent recommendation for surgical resection. A vascular surgeon evaluated each patient as part of the preoperative assessment, with subsequent discussion of surgical goals and informed consent.

Surgery was completed utilizing a two-team approach of both otolaryngologist and vascular surgeon. If gross transmural involvement of the carotid artery was noted, a complete en bloc resection of the tumor and involved carotid was performed and a vein graft was utilized for carotid reconstruction. If the specimen was firmly adherent, yet able to be dissected off the carotid, a frozen section was then sent from the margin closest to the carotid artery. If there was noted malignancy, then a partial resection of the involved wall of the carotid was performed with bovine pericardial patch reconstruction. Continuous cerebral perfusion was achieved throughout the repair as an argyle shunt was utilized as a conduit for blood flow. Following carotid reconstruction, Doppler confirmation of distal blood flow was confirmed and a pectoralis myofascial flap was harvested for coverage of the reconstructed vessel and surgical bed.

Postoperatively all patients were extubated in the presence of the vascular surgeon and otolaryngologist, and a gross neurological assessment was performed. Patients were sent to the intensive care unit for hourly neurological checks and stepped down accordingly.

**RESULTS**

Two consecutive patients, aged 57 and 78, with carotid involvement from advanced stage head and neck cancers were treated over a 12-month period. Both patients underwent composite resection with single-stage vascular reconstruction.

There were no immediate or delayed signs of neurological dysfunction. Mean anesthesia time was 387 minutes (418 and 356). Length of ICU stay was an average of four days (2 and 6 days), with a mean duration of total hospital stay of 14.5 days (15 and 14). There were no instances of graft failure or infection. Postoperative improvements in self-reported pain were detected by a 10 point visual Likert scale, with mean improvements from 10 to 3.5.

**CONCLUSIONS**

Carotid resection and reconstruction for advanced stage head and neck cancer represents a safe procedure which can be completed with minimal postoperative morbidity. Completion of these procedures requires a collaborative approach. Noted improvement in postoperative pain was measured, suggesting palliative benefits in quality of life.

**REFERENCES**

