Temporary Horner’s Syndrome Following Selective Neck Dissection
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INTRODUCTION

RISKS OF NECK DISSECTION
• Cervical lymphadenectomy for the treatment of head and neck cancer has evolved over time in an effort to reduce the morbidity associated with the procedure while maintaining oncological effectiveness.
• Based on predictable patterns of spread and the primary goal of preserving the spinal accessory nerve, modified radical and selective neck dissections were introduced and have gained wide acceptance.
• Despite these advances, injury to the numerous motor, sensory and autonomic nerves that course through the neck can still occur.

HORNER’S SYNDROME

• Horner’s syndrome is the triad of ptosis, miosis, and anhidrosis that results from injury to the cervical sympathetic chain. This complication has been reported to occur in less than one percent of neck dissections.
• We report a case of a patient with an oral tongue carcinoma treated with partial glossectomy and selective neck dissection (levels I-II) who developed a temporary Horner’s syndrome, discuss the potential mechanisms of this complication, and review the relevant literature.

CASE PRESENTATION

PREOPERATIVE HISTORY
• A 29-year-old woman presented with a nine-month history of a progressively enlarging painful lesion on her right lateral tongue.
• Physical examination revealed a 3 cm ulcerated right lateral tongue lesion. There was no palpable cervical lymphadenopathy.
• Computed tomography scan showed a 1.5 cm depth of invasion in the right lateral tongue. There were no cervical nodes suspicious for metastases.
• Biopsy of the tongue lesion revealed well-differentiated squamous cell carcinoma.

OPERATIVE EVENTS
• The patient underwent a right partial glossectomy and ipsilateral selective neck dissection (levels I-II) performed in the standard fashion. Tissue planes and all relevant surgical landmarks were easily identified.
• The sternocleidomastoid muscle, internal jugular vein, and spinal accessory nerve were preserved. The cervical rootlets were preserved. The cervical sympathetic chain was not dissected.
• Final pathology revealed a 3.5 cm well-differentiated squamous cell carcinoma with 76 cervical lymph nodes negative for carcinoma; pT2N0M0.

POSTOPERATIVE COURSE
• Right-sided miosis and ptosis were noted at three weeks postoperatively (Fig. 1A). The remainder of the physical examination was within normal limits. Vision was unaffected.
• The miosis resolved by two months. Her ptosis steadily improved and complete resolution was noted six months after surgery (Fig. 1B).
• She remains free of disease three years after treatment.

DISCUSSION

ANATOMY
• The cervical sympathetic trunk is located postero-medial to the carotid sheath, anterior to the deep cervical muscles and transverse processes of the cervical vertebrae, and deep to the prevertebral fascia (Figure 2).
• The cervical sympathetic ganglia are enlarged conglomerates of nervous tissue that lie alongside the trunk, at which secondary- and third-order neurons synapse.
• The number of cervical sympathetic ganglia may vary; however, four are most commonly cited: the superior cervical ganglion, the middle cervical ganglion, the intermediate ganglion, and the stellate ganglion.
• The cervical sympathetic trunk and its ganglia are not commonly dissected or encountered during neck dissection because of their anatomic location. Anatomic variations exist, however, and one study demonstrated the presence of the sympathetic trunk within the carotid sheath in 2/12 (17%) cadaveric dissections. (Lyons and Mills, 1998)

HORNER’S SYNDROME

Findings
• Full loss of sympathetic tone results in the classic triad of miosis, ptosis, and anhidrosis.
• Additional physical findings may include harlequin syndrome, characterized by hemifacial flushing and sweating secondary to an impaired vasomotor response; dry nostril, from vasomotor involvement of the nasocervical vascular plexus; and the appearance of exophthalmos secondary to ptosis.
• The presence of only a subset of physical exam findings is possible. The specific findings depend on the anatomic location of injury.

Clinical Considerations
• The duration of Horner’s syndrome may be temporary or permanent, depending on the mechanism of injury.
• Management is guided by patient symptoms. Most patients, however, are asymptomatic and require no specific treatment.
• The inability to accommodate has been reported; ophthalmological consultation should be considered for patients with visual complaints.

RELEVANT LITERATURE
• Horner’s syndrome following neck dissection is a rarely reported complication, occurring in four of 714 patients (0.56%) undergoing neck dissection (levels I-VI) in a recent series of patients with laryngeal or hypopharyngeal primary tumors. The authors found no association between neurologic injury and clinical parameters (age, gender, smoking, alcohol use, etc.) or other complications (wound, vascular, or chyle-related). Neuroradiation therapy was one of the exclusion criteria and therefore was not assessed. It was not reported whether these four cases were temporary or permanent. (Prim et al, 2006)
• A case of permanent Horner’s syndrome after radical neck dissection was recently reported. The authors describe injury to the cervical sympathetic trunk during dissection deeper to the carotid sheath than intended. (Bucci and Califano, 2008)

CONCLUSIONS

• Injury to the cervical sympathetic chain resulting in Horner’s syndrome is an uncommon but potential complication of selective neck dissection.
• Horner’s syndrome may be temporary or permanent depending on the nature of the injury. Traction, compression, and mild thermal injuries may result in temporary neurologic deficits, while transactions or severe thermal injuries may lead to permanent deficits.
• The specific physical findings of Horner’s Syndrome are dependent upon the location of injury to the cervical sympathetic chain.
• Appreciation of the relevant anatomy and potential mechanisms of injury may help to prevent this complication.

SELECTED REFERENCES