BRIEF COMMUNICATION

Horner’s Syndrome After Neck Surgery

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KEYWORDS
Horner syndrome; Neck; Surgery

Abstract  Horner’s syndrome (oculosympathetic paresis) is characterised by the classic triad of ipsilateral palpebral ptosis, pupillary miosis and facial anhidrosis. The syndrome arises from the interruption of sympathetic innervation to the eye and adnexa at varying levels. It is a rare complication of neck surgery. We describe 6 patients who presented with Horner’s syndrome after a neck procedure in our department during the last 5 years and review the different neck procedures that can cause it.
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PALABRAS CLAVE
Síndrome de Horner; Cuello; Cirugía

Síndrome de Horner secundario a cirugía cervical

Resumen  El síndrome de Horner (oculosimpatoparesis) consiste en la clásica triada de ptosis palpebral, miosis pupilar y anhidrosis facial ipsilateral. El síndrome resulta tras la interrupción de la inervación simpática del ojo y de los anexos oculares a diferentes niveles, siendo una complicación poco frecuente de la cirugía cervical.

Describimos los casos de 6 pacientes que presentaron síndrome de Horner tras cirugía cervical en nuestro servicio en los últimos 5 años y una revisión de los diferentes procedimientos cervicales que producen dicha entidad.
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Introduction

Claude Bernard–Horner’s syndrome (oculosympathetic paresis) was first described in humans in 1869 by Johann Friedrich Horner, although Claude Bernard had already carried out a physiological description of the cervical sympathetic in 1852, through experimental studies in animals.1 It exists in the classic triad of palpebral ptosis (blepharoptosis), pupillary miosis and ipsilateral facial anhidrosis, and it may be accompanied by iris heterochromia in the case of congenital lesions.2,3 The syndrome results from disruption of the sympathetic innervation of the eye and ocular adnexa at different levels.

According to their topographic diagnosis, the causes of Horner’s syndrome can be classified into: central, preganglionic and postganglionic.4 Central lesions are not usually isolated since they are accompanied by neurological symptoms, being the most common cause of Wallemberger...
### Table 1 Main Clinical Data of Studied Patients.

<table>
<thead>
<tr>
<th>Case</th>
<th>Age/Gender</th>
<th>Diagnosis</th>
<th>Surgical Intervention</th>
<th>Evolution of Horner’s Syndrome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case 1</td>
<td>29/F</td>
<td>Thyroid papillary carcinoma</td>
<td>Total thyroidectomy+left FCGD</td>
<td>Improvement at 5 months</td>
</tr>
<tr>
<td>Case 2</td>
<td>49/F</td>
<td>Left cervical sympathetic schwannoma</td>
<td>Cervicotomy and excision</td>
<td>Persistence after 2 years follow-up</td>
</tr>
<tr>
<td>Case 3</td>
<td>68/M</td>
<td>Hypopharyngeal epidermoid carcinoma</td>
<td>Total laryngectomy+right FCGD+left RCGD</td>
<td>Persistence until death 12 months after the intervention</td>
</tr>
<tr>
<td>Case 4</td>
<td>40/F</td>
<td>Retropharyngeal abscess with mediastinal extension</td>
<td>Cervicotomy and drainage</td>
<td>Complete resolution at 5 months</td>
</tr>
<tr>
<td>Case 5</td>
<td>41/F</td>
<td>Right cervical sympathetic ganglioneuroma</td>
<td>Cervicotomy and excision</td>
<td>Complete resolution at 11 months</td>
</tr>
<tr>
<td>Case 6 (Fig. 1)</td>
<td>57/M</td>
<td>Hypopharyngeal epidermoid carcinoma</td>
<td>Total laryngectomy+right RCGD+pectoralis major musculocutaneous flap</td>
<td>Persistence after 4 years follow-up</td>
</tr>
</tbody>
</table>


syndrome (stroke of the postero-inferior cerebellar artery territory).

The preganglionic lesions that most often cause Horner’s syndrome are trauma and tumours. Among the traumatic, those of iatrogenic origin are the most common, including the use of forceps during childbirth, epidural anaesthesia, placement of chest tubes, coronary bypass surgery and thyroid or parathyroid surgery, among others. Mediastinum and lung tumours may cause compression of the second order neurons, resulting in Horner’s syndrome along with shoulder and arm pain, also known as Pancoast syndrome.

Regarding postganglionic causes, the most notable are cluster migraine, since 2/3 of patients experience Horner’s syndrome at some point during their illness, and carotid dissection, in which the involvement of the cervical sympathetic nerve is the most common neurological manifestation and is present in at least half the cases. In the case of central and preganglionic lesions, we must mention ipsilateral facial anhidrosis, which often goes unnoticed by both patients and physicians conducting explorations.

Since Horner’s syndrome can be caused by different cervical surgical procedures, the aim of our study was to describe the cases of this syndrome secondary to cervical otolaryngological surgery occurring at our hospital, as well as to review published cases in the literature.

### Methods

We conducted a retrospective study of patients who suffered Horner’s syndrome after undergoing cervical surgery in our department over the past 5 years. We collected clinical data from the history of each patient and subsequently conducted a review of the medical literature.

### Results

A total of 6 patients presented Horner’s syndrome secondary to neck surgery performed by members of the ENT service of our hospital during this period. Table 1 describes the main clinical features of these patients.

### Discussion

The onset of Horner’s syndrome after cervical surgery is rare. The surgical procedures which most often trigger it are carotid endarterectomy and cervical spine surgery via an anterior approach.

There are several types of ENT interventions which can trigger the onset of Horner’s syndrome, the most frequent being removal of a schwannoma of the cervical sympathetic nerve. Table 2 lists those found in the literature secondary to cervical otolaryngological surgery, in addition to the cases described in our study.

The most common mechanism of injury of the cervical sympathetic nerve is direct lesion and the most common sites involved are the following:

1. Prevertebral fascia: when carrying out a cross section during cervical spine surgery.
2. Paratracheal area: mainly in thyroid and parathyroid surgery.
3. Posteromedial area to the carotid sheath: during the removal of carotid body tumours, whilst performing a carotid endarterectomy or other procedures involving the carotid artery, especially its posteromedial side.

![Figure 1](image.png) Right miosis and palpebral ptosis.
4. Lung apex: during the placement of high chest tubes it is possible to damage the stellate or cervicothoracic ganglion.\(^8\)

Cozzaglio et al. discussed the possible causes of Horner’s syndrome secondary to thyroidectomy, suggesting that this syndrome may be caused not only by a direct mechanism, that is, mechanical stress, but also indirectly by a lesion of the anastomosis with the various nerves and branches which follow the inferior thyroid artery\(^10\) or by inflammation and haematoma of the region, secondary to traction with a separator.\(^18\) Among our cases, patient number 1 underwent total thyroidectomy, as well as left functional cervical lymph node dissection, and presented the syndrome in the immediate postoperative period. This was not completely resolved, so we believe that there was an indirect mechanism involved in the lesion, as well as a direct mechanism with partial section of the nerve fibres.

Therefore, in order to avoid damaging the cervical sympathetic nerve during a surgical procedure (Table 2) it is necessary to be familiar with its anatomy and the presence of anastomosis with various surrounding nerves, which make it more labile to both tearing during surgery and to confusion with other structures.\(^19\)

Blepharoptosis may cause a slight loss of vision. The upper field of view is most commonly affected, but central vision may also decrease. It has been proven that palpebral ptosis reduces the overall amount of light reaching the retina, so that it may reduce visual acuity, particularly at night.\(^20\)

The prognosis of Horner’s syndrome will depend on the mechanism of injury. If the lesion was indirect there will often be a spontaneous recovery. However, in cases of complete section, the symptoms will persist.

When palpebral ptosis does not improve, surgical repair can be carried out with good aesthetic and functional results. Phenylephrine drops are an alternative to surgery, as this drug is an adrenergic agonist and acts on the sympathetic innervation of the Müller muscle of the affected eye, raising the upper eyelid by up to 2 mm. Anisocoria does not usually produce symptoms in these patients.\(^21\)

**Conclusions**

Horner’s syndrome may be secondary to numerous processes with different prognosis, although it is a rare complication of cervical surgery.

A good knowledge of the anatomy of the cervical sympathetic nerve is required to understand its appearance. In addition, careful surgical dissection, avoiding excessive tension with surgical instruments, should be carried out to prevent it.

The prognosis is usually good in cases without a total involvement of sympathetic innervation. Cases of complete section may cause ophthalmological problems which should be evaluated by a specialist.

**Conflict of Interest**

The authors have no conflicts of interest to declare.

**References**


