
CASE REPORT

Horner syndrome as a complication of central venous catheterization

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DATE OF RECEIPT:

30-10-2007

DATE OF ACCEPTANCE:

9-12-2008

CONFLICT OF INTEREST:

None

The insertion of a central venous catheter is a routine procedure, particularly in critical patients. The complications that have been described are many; fortunately they are rare and skill in performing the procedure bears a relation to their incidence. Horner syndrome is one such rare complication. The recovery rate is fortunately high. We describe a case in which clinical suspicion and radiologic assessment led to recognition of Horner syndrome in this context. Recovery was confirmed. The literature is reviewed, and possible mechanisms to explain these events are discussed. [Emergencias 2009;21:68-70]

Key words: Horner syndrome. Central venous catheter. Complication.

Introduction

In 1869 the Swiss ophthalmologist Johann Friedrich Horner described the case of a 40-year-old woman with cephalaea, ptosis, miosis and right facial erythema¹. He attributed these symptoms to cervical sympathetic pathway lesion. Previously, in 1852 the French physiologist Claude Bernard had described this clinical picture in animals. Currently, cervical sympathetic compromise is known as Claude Bernard-Horner syndrome or simply Horner syndrome. It may be produced by lesions of the cervical sympathetic pathway at any point between the hypothalamus and the eye (Figure 1)¹. In its complete form, on the same side of the lesion, there is miosis due to dysfunction of the pupil dilating muscle, resulting in anisocoria which typically worsens in the dark, with conservation of miotic response to light and adaptation, although reduced; variable degrees of eyelid ptosis due to denervation of the Müller muscle, which on occasions is the only sign; decreased sweating (anhidrosis) which only appears in central or preganglionic lesions and may affect the face, neck and part of the chest; discrete blood-shot conjunctiva secondary to vasodilation, heterochromia of the irises (blue-grey colours) present in

congenital forms; and enophthalmos (sunken orbit), more apparent than real. All these manifestations vary according to localization of the lesion.

Central venous catheterization is defined as the cannulation of large-calibre veins such as the internal jugular, subclavian and femoral veins. Most frequent indications for the procedure include: absence of or difficulty in cannulation of peripheral access, administration of irritant or vasoactive drugs, parenteral nutrition, haemodynamic monitoring (central venous catheterization pressure, pulmonary capillary pressure, cardiac output), emergency supply of large volumes of fluid, placement of temporary endocavity pacemaker or haemodialysis².

Central venous catheterization is considered an invasive procedure that should be carefully considered before use. Requirements include appropriate indication, optimal access and catheter type selection. Also, for safety reasons, the persons responsible for vascular cannulation should be experts in this technique and be able to determine the best access for each case, as well as being familiar with possible complications that may arise, such as pneumothorax, arterial puncture, nerve lesions, thrombosis, infection and arrhythmia, to name the most frequent.

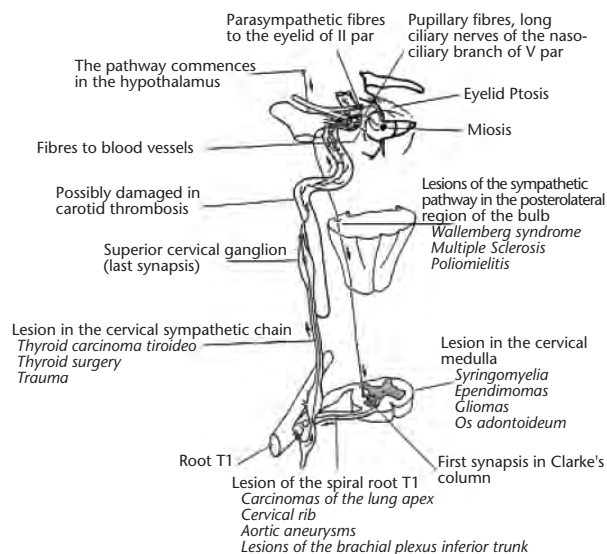


Figure 1. Cervical sympathetic pathway. Level of different lesions that may affect this pathway.

Central venous catheterization is a routine procedure, especially in critically ill patients. The literature contains descriptions of multiple complications, fortunately infrequent, often related to the expertise with which the procedure is performed. Horner syndrome is one of these infrequent complications; fortunately the percentage of cases with full recovery is high. We describe a case in which suspicion based on clinical symptoms and radiological findings led to confirmation of Horner syndrome with total recovery after treatment. We also include a review of the literature and analyze possible mechanisms involved in these episodes.

Case report

A 76-year-old woman presented at Emergency Department for a 48-hour episode of vomiting and oral intolerance. On examination, the patient showed clear signs of dehydration, hypotension and greatly affected general state. Given the impossibility of peripheral venous catheterization, it was decided to perform central venous catheterization, in particular using the right internal jugular vein.

The access site was infused with 7 ml mepivacain at 2% and the technique was then performed in accordance with established norms under strict aseptic conditions, and completed without incidence. Radiological control showed correct positioning of the catheter. At 35 minutes, the patient began to manifest a picture of eyelid ptosis and miosis with slight reddening of the right eye. She

was diagnosed with possible Horner syndrome due to lesion of the preganglionic cervical sympathetic pathway. At 3 hours, the patient showed spontaneous recovery of the ptosis, and the miosis disappeared 3 hours later. Echographic study of the neck ruled out the presence of fluid collection or haematoma in the anterior cervical region.

Discussion

Horner syndrome is due to an oculosympathetic lesion blocking nerve fibres at the central level (hypothalamus, encephalic trunk and cervical medulla) or peripheral and may be preganglionic (cervicothoracic, lung apex, mediastinum, anterior cervical region) where the local anaesthetic acted in the present case, or postganglionic (superior cervical ganglion, carotid artery, base of the cranium, cavernous sinus).

Possible etiologies include tumour or trauma of the central nervous system, syringomyelia, lung carcinoma, Pancoast syndrome, thyroid adenoma, cluster headache, carotid dissection, herpes zoster, complicated middle ear infection, trauma caused by childbirth labour and congenital causes. Infrequently, it may also be due to local anaesthetic administration^{1,3}.

The incidence of Horner syndrome is variable since it often goes unnoticed due to slight symptomatology and because of spontaneous recovery without the need for diagnostic or therapeutic procedures⁴⁻⁶. In our patient the most probable cause was increased sensitivity to the local anaesthetic administered. However, other possibilities reported in the literature may have been involved, including the risk of damaging sympathetic nerve fibres which increases with needle access proximity to the jugular vein if the needle-skin angle is large^{2,4-6}.

Although the clinical context of our case facilitated the diagnosis of Horner syndrome, differential diagnosis from other ophthalmologic entities is necessary, considering that they may share one or more of the same clinical characteristics, such as essential anisocoria, Holmes-Adie syndrome, Argyll-Robertson pupil and III par paralysis. Differential diagnoses may be performed using magnetic resonance imaging tests (angiographic or with gadolinium), or with topical 4% cocaine drop test (the pupil will fail to dilate normally in Horner syndrome patients)⁷.

In many studies, echography-assisted placement of the catheter has been shown to increase the success of the first attempt and to reduce the risk of complications⁸. It is accepted that echography is

a tool that can and should be used by emergency physicians to increase the success rates of different procedures, both diagnostic and therapeutic.

We performed a Medline search of the topic using the key words horner venous central and found 28 articles published since 1975. We found no review of the topic as such; the great majority were clinical case reports. After reviewing the most recently published articles⁹⁻¹⁵, it may be concluded that the frequency of jugular haematoma due to canalization of a central vein is around 7%, and only 3% of these developed Horner syndrome¹²⁻¹⁴; the syndrome presents more frequently in children⁹ and when jugular access is used as compared with subclavian access¹¹. In addition, the importance of using ultrasound to assist in the procedure is highlighted in the literature⁹⁻¹¹.

Bibliografía

- 1 Wray SH. Neurooftalmología: campos visuales, nervio óptico y pupila. In: Pavan Langston D. Manual de diagnóstico y terapéutica ocular. Barcelona: Salvat 1988;333-70.
- 2 Centeno ML, Barranco F. Canalización vascular. En Principios de Urgencias, Emergencias y Cuidados Críticos. Cap. 1.18. <http://Tratado.uninet.edu>
- 3 Day CJ, Shutt LE. Auditory, ocular and facial complications of central neural block. A review of possible mechanisms. *Reg Anesth* 1996;21:197-201.
- 4 De la Calle AB, Marin F, Marengo ML. Horner's syndrome following epidural analgesia for labor. *Rev Esp Anestesiol Reanim* 2004;51:461-4.
- 5 Lips U, Conrad I, Zevounou F, Schappler-Scheele B. "[Report on Two Cases of Irreversible Horner's Syndrome After Puncture of the Internal Jugular Vein]." *Anaesthesiol Intensivmed Notfallmed Schmerzther* 1982;17:301-2.
- 6 Reddy G, Coombes A, Hubbard AD. Horner's syndrome following internal jugular vein cannulation. *Intensive Care Med* 1998;24:194-6.
- 7 López R, Sierra J, Gutiérrez D. Disfunción episódica de pupila. *Vox Paediatrica* 2000;8:57-8.
- 8 Gilbert TB, Seneff MG, Becker RB. Facilitation of internal jugular venous cannulation using an audio-guided Doppler ultrasound vascular access device: results from a prospective, dual-center, randomized, crossover clinical study. *Critical Care Medicine* 1995;23:60-5.
- 9 Ford S, Lauder G. Case report of Horner's syndrome complicating internal jugular venous cannulation in a child. *Paediatr Anaesth* 2007;17:396-8.
- 10 Links DJ, Crowe PJ. Horner's syndrome after placement of a peripherally inserted central catheter. *JPEN J Parenter Enteral Nutr* 2006;30:451-2.
- 11 Sulemanji DS, Candan S, Torgay A, Dönmez A. Horner's syndrome after subclavian venous catheterization. *Anaesth Analg* 2006;103:509-10.
- 12 Batjom E, Ball A, Mercier F, Benhamou D. Horner's syndrome following internal jugular vein cannulation. *Ann Fr Anesth Reanim* 2006;25:662-3. Epub 2006 Apr 11.
- 13 Jarvis J, Watson A, Robertson G. Horner's syndrome after central venous catheterisation. *N Z Med J* 2005 May 20;118:U1470.
- 14 Taskapan H, Oymak O, Dogukan A, Utas C. Horner's syndrome secondary to internal jugular catheterization. *Clin Nephrol* 2001;56:78-80.
- 15 Mostaza AG, Molina E, Cebrián J. Horner syndrome prolonged after canalization of internal jugular vein. *Rev Esp Anestesiol Reanim* 1996;43:151-2.

Síndrome de Horner como complicación durante la colocación de una vía venosa central

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La cateterización de venas centrales es un proceso rutinario, sobre todo en enfermos graves. Es una técnica en la que están descritas múltiples complicaciones, afortunadamente no muy frecuentes, y en relación con la pericia del que la realiza. El síndrome de Horner es una de estas complicaciones infrecuentes aunque, afortunadamente su porcentaje de recuperación es elevado. Describimos un caso en el que por sospecha clínica, valoración radiológica y recuperación total confirmamos su aparición. Asimismo, se revisa la literatura y se analizan los posibles mecanismos de estos episodios. [Emergencias 2009;21:68-70]

Palabras clave: Horner. Vía central. Complicación.