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Tube Thoracostomy Associated Horner Syndrome: A Case Report

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Abstract

Horner Syndrome is a clinical syndrome caused by disruption of the sympathetic pathway, typically characterized by ipsilateral ptosis, miosis, and facial anhidrosis. Complications can arise during interventional procedures in the thoracic region due to proximity to the upper preganglionic nerve. A 21-year-old female patient who developed drooping of the right eyelid and Horner's syndrome following tube thoracostomy procedure is presented here. It is important to keep in mind that the tube has been removed and the condition may be reversible in terms of treatment.

Keywords: Horner syndrome, thoracostomy tube, ptosis

Tüp Torakostomi İlişkili Horner Sendromu: Bir Olgu Sunumu

Özet

Horner Sendromu (HS), sempatik fonksiyon bozukluğunun neden olduğu klasik olarak ipsilateral pitozis, gözbebeği daralması ve fasiyal anhidroz ile karakterize bir tablodur. Toraks bölgesinde yapılan girişimsel işlemlerde üst preganglionik sinire yakınlık nedeniyle komplikasyonlar gelişebilmektedir. Burada tüp torakostomi işlemi sonrasında sağ göz kapağında düşüklük meydana gelen ve Horner Sendromu tablosu gelişen 21 yaşında bir kadın hasta sunulmuştur. Tedavide hastanın tüpü çekilmiş olup geri döndürülebilir bir tablo olması açısından akılda tutulması oldukça önemlidir.

Anahtar kelimeler: Horner sendromu, tüp torakostomi, pitoz

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Introduction

Horner syndrome (HS) is a clinical condition characterized by ptosis resulting from interruption of the oculosympathetic pathway, along with miosis on the affected side and, less commonly, lack of sweating on the affected side of the face or forehead The oculosympathetic pathway is a three-neuron pathway. The central/first-order neuron originates from the hypothalamus and extends downward from the spinal cord. The preganglionic/second-order neuron arises from the first three thoracic spinal segments and travels through the thoracic and cervical regions until it synapses at the cranial cervical ganglion. The postganglionic/third-order neuron then travels from this ganglion toward the orbit. A disruption in any part of this pathway can lead to Horner's syndrome The topical application of cocaine is considered the gold standard for distinguishing Horner's syndrome from other causes of mydriasis. Topical application of 1% phenylephrine allows for the identification of postganglionic Horner's syndrome. Treatment and prognosis are determined based on etiology. (Martin, 2018). Various cases of Horner Syndrome following surgical procedures have been reported in the literature. (Min et al., 2021; Nasser et al., 2015; Vogiatzaki et al., 2017). Inserting a chest tube (tube thoracostomy) is a potentially life-saving procedure in emergency situations, and every physician working in the emergency department should have sufficient knowledge to perform it when necessary. The primary goal of inserting a chest tube is essentially to remove air or fluid (blood, lymph, pus, and others) from the pleural space. While the ideal insertion site for tube thoracostomy may vary between clinics, it is commonly preferred to use the area known as the safe triangle, which lies behind the pectoralis major muscle at the intersection of the 3rd to 5th intercostal spaces (ICS) with the midaxillary line (Ravi & McKnight, 2022). Inserting the tube outside the safe zone or sometimes the effect of edema can lead to various complications. Errors or negligence in medical treatment or procedures can be considered malpractice in some cases and may have legal consequences. Especially when medical practices fail to adhere to standards or expected care is not provided, resulting in harm to the patient, doctors and healthcare institutions may face legal liability.This report discusses a 21-year-old female patient who developed Horner Syndrome after a tube thoracostomy procedure.

Case

A 21-year-old female patient underwent wedge resection due to a hydatid cyst in her lung, followed by the placement of a 28 French drain and insertion of a right thoracostomy tube. After the procedure, she presented to the neurology clinic with complaints of drooping of the right eyelid. Besides a history of hydatid cyst, the patient had no other significant medical history, and her family history was unremarkable. Neurological examination revealed ptosis and miosis in the right eye, with no anhidrosis.(Figure 1) Anisocoria became more pronounced when transitioning from light to darkness.

The patient's right eye showed pupil constriction when exposed to light, with a pupil diameter of 3.5 millimeters (mm) for the right pupil and 4.5 mm for the left pupil. Without exposure to light, the pupil diameter for the right eye was 4 mm and for the left eye was 5.5 mm. The physical examination of the patient revealed

a 2-centimeter scar at the intersection of the right 5rd intercostal space with the midaxillary line. Other system examinations were unremarkable. Pharmacological tests could not be performed on the patient, however, based on clinical findings, Horner's syndrome was considered. Based on the history, examination, and imaging findings, a diagnosis of Horner syndrome associated with upper cervical ganglion was made.The position of the thoracostomy tube was considered as the likely cause, and the tube was removed (Figure 2). The patient was started on oral prednisolone at a dose of 1 mg/kg/day, with a planned gradual tapering. Partial improvement in eyelid drooping was observed during clinical follow-ups. The patient was informed about the possibility of sensitivity and susceptibility to infection in the eyes due to ptosis, and they were advised to seek medical attention in case of any complaints. Ophthalmologists have planned surgery for ptosis if necessary six months later.

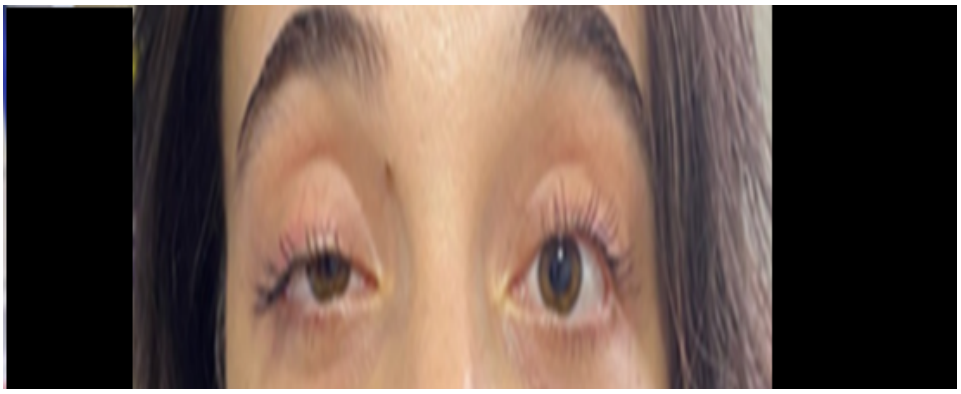

Figure 1. The patient's miosis and ptosis symptoms

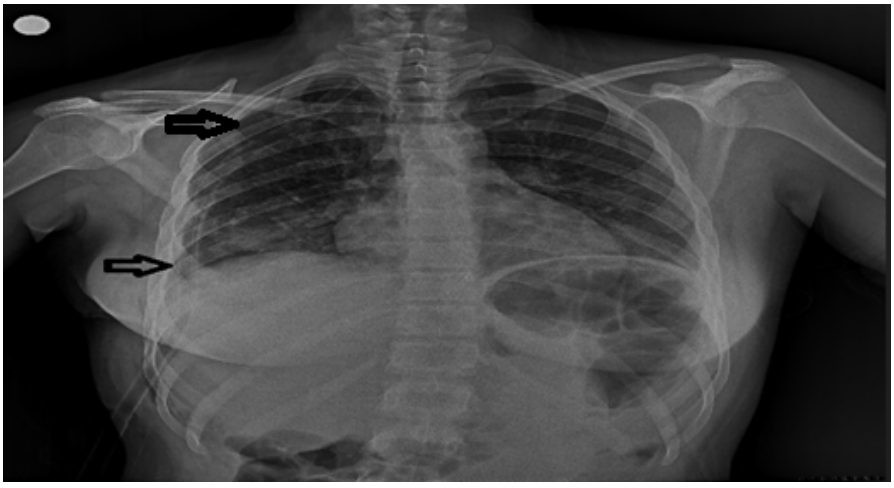

Figure 2. Placement of the chest tube

Chest radiograph revealed no residual effusion but suggested that the tube tip was positioned inappropriately high.

Discussion

Horner Syndrome is a clinical syndrome caused by dysfunction of the sympathetic nervous system and is classically characterized by ipsilateral ptosis, miosis, and facial anhidrosis. The difference in pupil size in the dark is more pronounced. HS can be attributed to various causes such as severe trauma, carotid dissection, malignancy, among others (Tang et al., 2022). Cases of Horner Syndrome have been reported in the literature following tube thoracostomy procedures (Thomas et al., 2013; Kesieme et al., 2012). Incorrect placement of the chest tube can lead to various complications, and HS is a relatively rare complication. The abnormal placement of the thoracic tube may hinder the intended purpose of the tube and, through its compressive effect, result in undesired complications. The onset of findings is variable and can occur hours to days after chest tube insertion. The clinical course associated with chest tube thoracostomy resolves spontaneously in one-third to two-thirds of cases. Reversibility may be associated with how quickly this complication is detected and treated (Kwiat et al., 2014). Particularly in the superior cervical ganglion's proximity to the thoracic apex, improperly placed thoracic tubes can facilitate external pressure on the ganglion. Care should be taken during the procedure regarding proximity to the upper cervical ganglion. It is suggested that direct trauma, local hematoma, pressure ischemia, inflammation, and induced adhesions all play a role. (Ozel & Kazez, 2004; Fleishman et al., 1983; Shen & Liang 2003). In our case, the tube was apically positioned, potentially causing pressure on the superior cervical ganglion. After radiological confirmation, the misplaced tube should be retracted 2-3 cm as soon as possible. Depending on the degree of ganglion damage, clinical improvement may fully or partially occur. (Kesieme et al., 2012). Tube removal can eliminate compression on the nerve, and in our case, improvement in eyelid drooping was observed after tube removal and oral prednisolone therapy. It has been observed that in cases where intervention is delayed, the rates of recovery are lower. In cases of early intervention, the improvement of Horner syndrome with the repositioning of the chest tube supports the neuropraxia hypothesis in pathophysiology. (Kaya et al., 2003; Shen & Liang 2003; Zagrodnik & Kline 2002). During interventional procedures, attention should be paid to proximity to the preganglionic sympathetic nerve, and the potential for complications such as HS due to incorrect localization should be kept in mind. Given its potential reversibility, when anisocoria is observed in thoracic surgery practice, prompt repositioning of the chest tube is essential.

Ethical Considerations

We confirm that we have read the Journal’s position on issues involved in ethical publication and affirm that this report is consistent with those guidelines. The individual's participation in the study is based on voluntary consent, and informed consent has been obtained from the individual prior to the study for the use of patient information and photographs. As the case presentation is within the scope of evaluation, no ethics committee approval has been obtained. The study has not been presented elsewhere before and is not part of another study. The Helsinki Declaration has been adhered to during the implementation.

Disclosure

No conflict of interest was declared by the authors.

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