# Horner's Syndrome Following Internal Jugular Catheterization: A Case Report

Ebru Özen, Serdar Ekemen, Serap Kara, Birgül Büyükkıdan Yelken

Department of Anesthesiology and Reanimation, Division of Intensive Care, Eskişehir Osmangazi University School of Medicine, Eskişehir, Turkey

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## Abstract

Central venous catheterization is an invasive procedure used in total parenteral nutrition, venoirritating drug use, massive and rapid blood transfusion, hemodynamic monitorization, hemodialysis, and percutaneous pacemaker implantations. Various complications may occur during or after this percutaneous procedure at an incidence rate of 5%–19%. The internal jugular vein (IJV) is often used for hemodialysis catheterization procedures because it is associated with a lower risk of complication, although complications such as carotid arterial puncture, vessel erosions, thrombosis, and infections may occur. Horner's syndrome (HS) may also develop as a rare complication of IJV cannulation. Here we report a case of HS that developed due to IJV cannulation for plasmapheresis.

**Key words:** Internal jugular catheterization, complication, Horner's syndrome, intensive care unit

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## Introduction

Central venous catheterization (CVC) is an invasive procedure performed for providing a large intravenous route for rapid fluid resuscitation and blood transfusion in surgeries when severe fluid or blood losses are expected or in shock for monitoring, parenteral nutrition, administration of irritant medications, hemodialysis and the placement of transcutaneous pace electrodes (1). Various complications can be observed at the rate of 5-19% in CVC attempts with the percutaneous approach. Arterial puncture-related hematoma, vascular erosion, thrombosis, stenosis, arrhythmias, hemothorax, pneumothorax, air embolism, adjacent nerve injuries, and infection can be listed among these complications (1, 2). One of the rare complications is Horner's Syndrome (HS). HS has been reported in cases with the placement of a central venous catheter into the internal jugular vein (IJV) for various purposes (3-8). In this article, it was aimed to present a case in which emergency plasmapheresis was planned due to drug intoxication and in which HS developed due to the temporary dialysis catheter placed into the IJV.

## Case Report

A 22-year-old female, 48 kg in weight and 162 cm in height, was admitted to the emergency service of our hospital after suicidal ingestion of 28 tablets of Lustral 50 mg (total dose 1400 mg sertraline HCl). Physical examination of the patient, whose medical record included only a diagnosis of obsessive-compulsive disorder, was normal except for somnolence. The patient was admitted to the anesthesia intensive care unit for follow-up and treatment. Emergency plasmapheresis was planned for the patient in whom extrapyramidal symptoms (tremor) were present and there was enzyme elevation (AST:760 U/L, ALT:98 U/L, LDH:1149 U/L, CK:14511 U/L) in biochemical tests. Plasmapheresis was performed to the patient after the placement of a temporary dialysis catheter on the first attempt and without any complications with the Seldinger technique from the right IJV. The enzyme values of the patient regressed after plasmapheresis, and extrapyramidal symptoms disappeared. During the next day's physical examination, the patient was found to have ptosis in her right eyelid and myosis also in her right eye. It was observed that anisocoria was more prominent in the dark when the examination was repeated in the dark and light. The right pupil was measured to be 3 mm with a light source and to be 3.5 mm without the light. These values were determined to be 4.5 mm and 5 mm for the left pupil. In the patient without enophthalmos and anhydrosis, the light reflex was present in both eyes, and the accommodation was found to be intact. No other pathology was found during the physical examination. Since the symptoms were on the side where the central venous catheter was applied, the IJV catheter was removed considering that HS developed due to the central venous catheter. The patient was consulted with neurology department, and brain MRI was performed for control purposes. The patient, whose neurological examination and brain MRI revealed no pathology, was transferred to the psychiatric service after 5 days of follow-up in the ICU, with partial improvement of ptosis and anisocoria. Patient's consent was obtained for the case report.

This case has been presented as a poster in TARC 2015 which was organized between, 2-6 April 2015, Antalya, Turkey.

**Address for Correspondence:** Ebru Özen, e.mail: drebruozen@gmail.com
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## Discussion

The use of central venous catheters for intravenous access in the case of acute hemodialysis is quite common. Central venous temporary dialysis catheters can be placed to the IJV, subclavian vein, and femoral vein for emergency hemodialysis (9). Due to the recent low incidence of complications, ease of intervention, and high success rates, the IJV is frequently preferred in CVC placements (5). Internal jugular vein catheterization has rarely been a cause of HS, as well as common complications such as pneumothorax, emboli, arrhythmias, vascular injury, and hematoma (3, 10, 11).

Horner's Syndrome occurs as a result of the damage to the oculosympathetic nerve at any level. In the oculosympathetic pathway, lesions may be at different levels, such as the cerebral hemisphere, hypothalamus, cervical spinal cord, T1 spinal cord, cervical sympathetic chain, and carotid plexus. Clinically, it is characterized by myosis, ptosis, enophthalmos, loss of sweating on the same side of the face, a temporary reduction in the intraocular pressure, increased accommodation amplitude, and changes in tear viscosity (3-5, 12). Common causes are tumors in the lung apex, aortic dissection, carotid artery dissection, traumas in the neck region, local anesthetic injection to the IJV area and deep tissue, and epidural anesthesia (4, 12).

The incidence of HS is variable and is not known precisely because it is usually associated with clinical symptoms that are mild and do not require treatment and heals spontaneously (3-6).

Horner's Syndrome can be clinically diagnosed, and pharmacologic agents are very useful in the diagnosis. Hydroxyamphetamine solution, apraclonidine 0.5% drops and cocaine drops are used in the diagnosis of Horner's Syndrome. While hydroxyamphetamine solution dilates the pupils in central and preganglionic cases by increasing noradrenaline secretion from the third neuron, it does not cause dilation in postganglionic Horner's Syndrome cases. Apraclonidine 0.5% is an alpha-adrenergic agent. Nowadays, it has begun to be used instead of cocaine drops. While apraclonidine causes myosis with presynaptic alpha 2 inhibition in normal pupils, it causes dilatation in cases with Horner's Syndrome due to supersensitivity in pupils and causes anisocoria to reverse (7, 8). Because the symptoms developed following central catheterization and no other neurological pathology was detected during the physical examination and brain MRI, we clinically diagnosed this case without applying pharmacological agents.

Repeated attempts during central catheterization increase the risk of the HS development (4, 5, 13). Cases developing HS due to the IJV catheterization as a result of three or more repeated attempts have been reported (5, 13, 14). It has been noted that HS can develop around the IJV, which is a close neighbor of the cervical sympathetic chain, due to the hematoma pressure that may occur as a result of multiple attempts or the trunk damage as a result of the direct traumatic effect of the needle (5, 6, 13, 14). However, it has also been reported that HS developed due to a direct trauma to the cervical sympathetic trunk with the catheter needle after the placement of IJV catheter on the first attempt and without complications (4). In a case in which an IJV catheter was placed by applying local anesthetic around the IJV, Hernández et al. (6) reported that HS developed within 35 minutes and the symptoms regressed spontaneously within 3 hours, and they attributed the HS development to the local anesthetic injection. It has been reported that the large angle between the needle and the skin and the over-rotation of the head and neck in the central venous catheter placements to the IJV may increase the risk of the damage to sympathetic nerve (3-5). Additional diseases such as hypertension and diabetes have also been reported to increase the risk of HS development (15).

In our case, the CVC procedure was performed on the first attempt and without complications from the right IJV. The presence of HS symptoms on the same side with the catheter on the day following the placement of CVC and the absence of other symptoms during the neurological examination suggested that the HS development was due to IJV catheterization. This situation is explained by the possibility of HS development due to injury of the cervical sympathetic trunk that courses near the IJV as a result of a direct trauma by the catheter needle or dilatator.

## Conclusion

It should be kept in mind that HS, as well as common complications such as hemorrhage, thrombosis, and infection, may develop following IJV catheterization, which we often perform in the intensive care unit.

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