CLINICAL EVIDENCE ON RISK AND COMPLICATIONS OF THE STELLATE GANGLION BLOCK: TRANSIENT LOCKED-IN SYNDROME

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[Esperienza clinica su rischio e complicanze del blocco del ganglio stellato: sindrome “locked-in” transitoria]

SUMMARY

The Authors present a case of a patient affected by algodystrophic syndrome of the hand and the upper limb treated with the stellate ganglion block.

After the explanation of that local anaesthetic procedure, they describe the transient locked-in syndrome as complication of the block.

They conclude, according to the scientific literature, proposing a rotation maneuver of the needle on its axis to avoid the appearance of the syndrome.

Key words: Stellate ganglion block, procedure, accidental intra-arterial injection, complication, transient locked-in syndrome

INTRODUCTION

Some pain syndromes are caused by altered responses of sympathetic trunk that consist in long chains of ganglia stretching along each side of the vertebral column from the base of the skull to the coccyx. One of this ganglia, the stellate ganglion, refers to the one formed by the fusion of the inferior cervical and the first thoracic ganglion as they meet anterior to the vertebral body of C7.

The stellate ganglion block is a local anaesthetic procedure that let doing differential diagnosis and treatments of pain syndromes of head, neck and upper limb in which is involved sympathetic nervous system (reflex sympathetic dystrophy syndrome, causalgia, atypical facial neuralgia, phantom limb, herpes zoster, Ménièr’s disease, Raynaud’s disease). A fearsome complication of this procedure, besides aphasia, blindness, emiparesis, Apnea and possible phrenic and superior laryngeal nerve block, is transient locked-in syndromes resulting from accidental carotid or vertebral artery injection.

The patient is conscious because the reticular activating system is spared but the clinical picture is different according to the gravity of the lesion.

CLINICAL FORMS

Three varieties of locked-in syndrome have been described: classical form is characterized by tetraplegia, facial diplegia, labio-glosso-pharyngeal paralysis, laryngeal paralysis, with preservation of vertical gaze and upper eyelid movement, consciousness and mental functions and possible communication between patient and examiner. The incomplete variety is similar to classical one except that the patients have remnants of voluntary motion (es. open mouth, swallowing) besides upper eyelid and vertical eye movement. The total variety is composed of a group of patients who are totally immobile and are unable to communicate. The relationship between this patients and the external environment is almost impossible because they can express yourself only winking or looking at letters on tables.

Nowadays they can use computers and spelling devices.

MATERIAL AND METHODS

A 45-year-old, 80 kg man was referred to our hospital with complaining algodystrophic syndrome
of the hand and the upper limb, and was treated with the stellate ganglion blockage.

The patient was placed in the supine position with the neck slightly extended, the head rotated slightly to the side opposite the block, and the jaw open. The point of needle puncture is located between the trachea and the carotid sheath at the level of the cricoid cartilage and the Chassignac’s tubercle. Although the ganglion lies at the level of the C7 vertebral body, the needle is inserted at the level of C6 to avoid the piercing the pleura.

Using 22G needle we injected 8-10 ml of bupivacaina 0.25 % perpendicular to the skin plane, laterally cricoid cartilage.

Vital signs of the patient were monitored to verify the presence of side effects to demonstrating the success of the block (Bernard-Horner’s syndrome, disfonia, sensory-motor block of the upper limb).

We preceded administering 7 dosing of 10cc of bupivacaina for 14 days. 5 injections were made without any problems but after the sixth dosing suddenly the patient was not able to breath autonomously, move or speak. He was haemodynamically stable, blood pressure 125/85, pulse rate 72 bpm, he reacted to stimuli moving the eyelids only.

Treatment in emergency consisted in 3 mg Kg-1 (240 mg totally) dosing of thiopental without using any muscle relaxants, then we intubated the patient observing vocal cords motionless.

Then we transferred the patient to the intensive care unit where he was connected to an automatic ventilator. Laboratory determination was in normal range. 2 hours after that complication the patient was able to breathe spontaneously so he was extubated. Because of the stability of vital signs we decided to dismiss the patient, inviting him to do controls in 12 month of follow up.

Discussion

In our opinion respiratory arrest and tetraplegia could be caused by stellate ganglion block with bupivacaina, saving palpebral and vertical eye movements. A transient locked-in syndrome occurred because of accidental injection of anaesthetic into the vertebral artery. The more accredited hypothesis could be that the needle passed superior to Chassaignac’s tubercle and penetrated parallel to the arterial wall, resulting in a one-way valve effect and in this situation blood may not be aspirated because of turbulence effect around the needle bevel that may result in negative pressure which opposes applied negative pressure by the syringe while the drug could be easily injected.

The introduction of the needle into the vessel not parallel to the arterial wall and in the opposite direction to arterial flow could avoid the risk of the creation of the one-way valve effect and reduce the possibility of not identify an intravascular injection.

Conclusions

Risk and complications of the stellate ganglion block could be fearsome and resulting from an accidental intra-arterial injection into carotid or vertebral artery.

On of the complications of that block described in medical literature in a transient locked-in syndrome in consequence to an unintentional intra-arterial administration into vertebral artery.

Actually sometimes it can be occur the creation of one-way valve effect because of blood is not aspirated but the drug is injected.

Scientific literature reports some cases in which Authors propose rotation of the needle on its axis while aspirating the blood or the aspiration of the blood four times in four positions (3,6,9 and 12PM) of the needle without changing the depth of the needle before injecting the drug.

References