

Transient Abducens Paralysis Following Therapeutic Nerve Blocks of Head and Neck

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Abducens nerve palsy is an infrequent complication of dural puncture and/or subarachnoid block.¹ A review of the literature of the last 20 years, however, did not reveal any report of this complication following peripheral nerve blocks. Two cases of transient abducens nerve paralysis are described.

REPORT OF TWO CASES

Patient 1. A 63-year-old man with a diagnosis of chronic neuralgia of the first and second divisions of the trigeminal nerve was referred to us for treatment. The history revealed frequent attacks of severe pain of one to two minutes' duration over the right eye for the past six years. This pain had been controlled with diphenylhydantoin (Dilantin) until about six months previously, when it had become intolerable, necessitating hospitalization of the patient. This recent exacerbation of pain, refractory to diphenylhydantoin, was triggered by pressure on the right upper incisor and canine teeth and made eating extremely difficult. Physical examination disclosed no abnormality. There was no evidence of sensory deficit in the distribution of the trigeminal nerve. Laboratory tests of blood and cerebrospinal fluid, x-ray, brain scan, and electroencephalogram revealed no pathologic change. The patient obtained considerable relief from four daily doses of 300 mg carbamazepine (Tegretol), except that pressure on the teeth continued to trigger pain. The patient refused preganglionic trigeminal rhizotomy. An infraorbital block with absolute alcohol during this hospitalization resulted in relief of pain for only a week.

On the first visit a maxillary block was performed in the sphenopalatine fossa by the lateral extraoral route with 1 ml of 2 per cent 2-chloroprocaine hydrochloride (Nesacaine), followed by 0.5 ml of absolute alcohol. Relief of pain was transient. A week later the injection was repeated with 2 ml of 2 per cent 2-chloroprocaine, which alleviated the pain only slightly. Consequently,

about 10 minutes later, 1 ml of 2 per cent lidocaine hydrochloride (Xylocaine) was injected into the greater palatine fossa by the oral route. When this had completely eliminated the pain triggered by pressure on the teeth, 0.75 ml absolute alcohol was injected into the same area.

About 15 to 20 min after the first injection (2 ml 2 per cent 2-chloroprocaine), the patient complained of double vision, and right abducens paralysis was found. There was no other apparent sign or symptom. The patient was kept under observation. He was discharged two hours later when the abducens paralysis subsided. He has remained free of pain since.

Patient 2. A 72-year-old woman, complaining of pain in the posterior distribution of the second cervical nerve on the right following herpes zoster of about three months' duration, was referred to us for treatment. Three right stellate ganglion blocks at weekly intervals did not give any significant relief. Injection of 3 ml of 1.6 per cent 2-chloroprocaine containing 0.2 per cent tetracaine hydrochloride (Pontocaine) into the posterior branches of the involved nerve by the lateral approach resulted in good temporary pain relief, and this injection was repeated at weekly intervals. At the sixth visit, when 3 ml of Pontocaine were injected on the anterior surface of the second right cervical transverse process and 4 ml above and behind it, right abducens paralysis developed in 10 to 15 min. At the same time, the patient complained of dizziness and nausea. She vomited several times and her skin became moist. The blood pressure rose to 210/120 torr (her normal range was 130/85 to 140/90 torr). A few minutes later mydriasis of both eyes was noted. The patient was observed for about 90 minutes. During this time all signs and symptoms, except the diplopia and mydriasis, disappeared. A patch was put on the involved eye and the patient was allowed to go home. Two hours later she reported by phone that the diplopia had disappeared and eye movements had become normal. When she was seen a week later, no after-effect of the reaction to the nerve block could be found.

COMMENT

The abducens nerve supplies the lateral rectus oculi muscle. It emerges from the brain at the inferior border of the pons and runs subarachnoidally in the posterior fossa before it pierces the dura mater, makes a

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sharp bend over the angular apex of the petrous portion of the temporal bone, enters the cavernous sinus through Dorelli's canal, and reaches the orbit through the superior orbital fissure.

Because of its long and angular course at the base of the brain, it is vulnerable to mechanical damage after intercranial pressure changes caused by spinal puncture and/or subarachnoid block.¹ Under these circumstances the onset of abducens nerve palsy is gradual. Diplopia develops in 3 to 21 days after prodromal symptoms of headache, dizziness, nausea, and stiff neck.

In our two cases diplopia appeared 15 to 20 minutes after nerve block was completed. It is conceivable that in the first case some of the 2-chloroprocaine injected into the sphenopalatine fossa could have reached the abducens nerve through the inferior orbital fissure.

In the second case the most probable sequence of events was diffusion of 2-chloroprocaine through the dural sleeve of the second cervical nerve into the spinal subarachnoid space. The ability of 2-chloroprocaine to diffuse through the dura has been demonstrated.² From the spinal subarachnoid space the local

anesthetic may have diffused to the basal cisterns and from there to the vicinity of the abducens nerve on its way from the brain to the point where it pierces the dura. A second possibility that cannot be excluded is that 2-chloroprocaine was injected directly through the dural sleeve of the second cervical nerve into the spinal subarachnoid space and that the time lag between the block and the onset of abducens paralysis resulted from the time necessary for diffusion to the spinal fluid of the posterior fossa.

The two case histories illustrate that when local anesthetic agents are injected at sites from which they may diffuse to the vicinity of the relatively thin abducens nerve, transient abducens paralysis may develop. In the cases described, the paralysis subsided within three hours, with no after-effect.

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Indirect Measurement of Left-atrial Pressure in Surgical Patients— Pulmonary-capillary Wedge and Pulmonary-artery Diastolic Pressures Compared with Left-atrial Pressure

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Recently reported data have demonstrated the disparity between right ventricular and left ventricular function in seriously ill patients with or without obvious heart disease.¹⁻⁴ The

use of right-heart filling pressure (right atrial or central venous) of such patients to estimate left-heart filling pressure may be misleading. As left-atrial pressure can seldom be measured in patients not undergoing cardiac surgery, indirect estimation of left-heart filling pressure may offer valuable clinical information. The introduction of a flow-directed balloon-tipped pulmonary-artery catheter* (Swan-Ganz) has made possible the widespread clinical measurement of both pulmonary-artery diastolic (PAD)

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