Cranial nerve palsy as a delayed complication of attempted infanticide by insertion of a stylet through the fontanel

Case report

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A child suffered a sixth and seventh cranial nerve palsy due to intracerebral insertion of a stylet. The stylet was introduced through the anterior fontanel, most probably in an attempt at infanticide. The migration of the stylet through the brain was monitored because the child was first examined 6 years earlier. At operation, the cranial part of the stylet lay in the fourth ventricle, compressing the facial nerve as well as the nucleus of the abducens nerve. The lower part of the stylet had reached the C-5 level.

KEY WORDS - cranial nerve palsy • foreign body migration • foreign body

CRANIOCEREBRAL injuries caused by penetrating foreign bodies are quite rare in civilian life. Most of these penetrating injuries stem from accidents, criminal assaults, or self-inflicted injuries. There are reports on perforation of the brain by almost every conceivable object including bullets, knife blades, crochet hooks, harpoons, umbrella ribs, wires, keys, nails, pieces of wood, scissors, sewing needles, and other bizarre objects. The neurological deficits usually appear immediately or shortly after penetration of the central nervous system. The clinical symptoms depend on factors such as the localization within the brain and the speed and rotational force of the penetrating object.

Delayed onset of neurological symptoms has been reported by Ameli and Alimohammadi and Askenasy, et al., each of these groups described two adult patients with sewing needles penetrating the brain. Two of these patients suffered from epileptic fits, one complained of blurred vision and a headache, and the other showed a left hemiplegic syndrome. These authors hypothesized that the needle had probably been inserted through the fontanel in early childhood since there was no evidence of traumatic injury in adult life. We report a child with delayed onset of neurological symptoms, due to a gradual downward intracerebral displacement of a stylet.

Case Report

This 12-year-old boy was admitted because of acute headache, neck pain, vomiting, and the asymmetrical appearance of his face. He had been adopted from Ecuador at the age of 14 months. Because of his quarrelsome behavior and slight mental retardation, he was first examined at our Center for Child Neurology 6 years before the present admission. At that time there were no neurological abnormalities on physical examination; however, x-ray examination of the skull showed a foreign body in the center of the brain about 3 cm dorsal from the clivus. The caudal ending of this object appeared to be sharp, suggesting a stylet (Fig. 1). Because of the absence of neurological deficits, surgery to remove the stylet was not attempted. During the following years, the child was seen regularly by one of our staff and no change in his neurological status appeared until he started complaining of headaches, neck pain and vomiting, and his face was asymmetrical.

Examination. Physical examination showed a normally alert, well-oriented boy. There was slight stiffness of the neck, but no other meningeal signs were apparent. Examination of the cranial nerves showed an isolated inability to abduct the left eye, indicating a weakness of the left rectus externus muscle. His face was
Delayed cranial nerve palsy due to intracerebral stylet

FIG. 1. Skull x-ray film of the patient at age 6 years showing the stylet in the center of the brain about 3 cm dorsal to the clivus.

asymmetrical with drooping of the mouth on the left side and he was unable to close his left eye. Sensory examination revealed a decreased pinprick sensation on the left side of the face. The remainder of the physical examination showed no abnormalities.

Routine blood and serological examination was normal. The Borrelia Burgdorferi titers were negative. Examination of the cerebrospinal fluid (CSF) showed abnormal protein content and the cell count was not elevated. The CSF glucose and chloride content was within normal limits. Brain-stem auditory evoked potentials revealed no abnormalities. The blink reflex showed an efferent defect on the left. Repeat x-ray examination of the skull and cervical spine revealed the foreign body reaching as far as the C-5 level (Fig. 2 left).

A computerized tomography scan of the cervical spine confirmed the location of the stylet in the spinal canal, dorsal to the spinal cord.

Operation. Under general anesthesia, a suboccipital cervical midline incision was carried out, followed by a laminectomy from C-3 to C-5. After the dura mater was opened, a dark shadow became visible deep within the subarachnoid space. Opening of the arachnoid membrane revealed a sharp, flat stylet with a diameter of about 3 mm. In order to mobilize the stylet it was necessary to expose it over its entire length by a subsequent laminectomy of C-1 and C-2, followed by suboccipital trephination. The dura was opened and the cerebellar tonsils were moved aside. It became apparent at this point that the rostral part of the stylet was located in the caudalmost part of the fourth ventricle, reaching about 2.5 cm cranially from the obex, where fibers of the facial nerve run dorsomedially toward the floor of the fourth ventricle and turn at the medial side of the abducens nucleus to traverse laterally through the pons. The caudal part of the needle was firmly fixed in arachnoidal layers and reached as far as C-5. The stylet, measuring 7.5 cm, was totally removed using microsurgical techniques (Fig. 2 right).

FIG. 2. Left: Cervical spine x-ray film of the patient at age 12 years showing downward migration of the stylet, reaching the C-5 level. Right: Photograph of the stylet, measuring 7.5 cm, just after removal.

Postoperative Course. The patient made a good postoperative recovery. Complete peripheral left-sided facial nerve palsy remained; however, the partial lesion of the trigeminal and abducens nerves disappeared completely.

Discussion

In some countries a form of infanticide is practiced involving insertion of a stylet through the anterior fontanel into the cerebrum. Most probably many of these children die at a young age, while other cases go undiscovered. Indeed, without autopsy or x-ray examination, there is usually no visible evidence of infliction. The puncture wound heals quickly and some of these children even reach adolescence. Ameli and Alimohammadi described two adult patients in whom sewing needles had penetrated the cerebrum and become imbedded in the midline of the posterior frontal region. As it was extremely unlikely that the needles could have entered the skull accidentally, it was assumed that they had been inserted intentionally before the closure of the anterior fontanel. It is interesting that these needles can remain lodged in brain tissue for many years or even decades without causing any apparent neurological complaints until suddenly the patient develops focal neurological symptoms, epilepsy, blurred vision, headache, or hemiparesis.

In our case we were able to examine and follow our patient over several years. It is of considerable interest that an intracerebral foreign body such as this sharp,
thin stylet is capable of migrating though the brain over quite a period of time. Our patient presented when he was 6 years old without any neurological symptoms. At that time the stylet was located in the midline. We suspect an attempted infanticide by insertion of the stylet through the anterior fontanel. The x-ray studies in Figs. 1 and 2 show that the stylet had somehow changed its position and gradually migrated downward. The most probable cause of this migration is the force of gravity. The stylet was located in the caudalmost part of the fourth ventricle. It is obvious that the stylet compressed the facial nerve and to a lesser extent the abducens nucleus, as fibers of the facial nerve are located between the floor of the fourth ventricle and the abducens nucleus as they curve around the nucleus to run laterally through the pons.

The formation of connective tissue around an intracerebral foreign body, as suggested by Askenasy, et al., might be expected to prevent further incursion; however, this did not occur in our patient. Our findings indicate that an intracerebral foreign body is capable of causing focal neurological deficits even after many years and emphasize the need for thorough follow-up monitoring of these patients over a long period of time.

References

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