Pneumocephalus Associated with Injury of the Orbit

A Case Report

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Fractures involving the frontal sinuses, the cribiform plate and the mastoid air cells are the usual cause of air within the cranial cavity (pneumocephalus). Erosion of bone by neoplasm or infection, cranial surgery, and gunshot wounds have provided less common avenues of air entrance. A recent instance of intracranial air was noted following a ventriculopleural shunt procedure; in this case, erosion of a bronchiole by the pleural tube was presumed to cause the first link in the chain of air channels.

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The case presented in this report illustrates pneumocephalus after an unusual injury.

Case Report

The patient was a 21-year-old man. On June 28, 1964, he made a suicide attempt by thrusting a ball point pen into his right orbit. The entrance point was inferior to the globe. The pen was directed posteriorly and medially and it remained firmly wedged in place. Immediate, right sided, visual loss had occurred.

A skull x-ray disclosed air in the subarachnoid spaces and ventricles. The metallic tip of the pen was in the region of the apex of the orbit. Most of the shaft of the pen was radiolucent (Fig. 1).

In the operating room the pen was grasped and ex

Fig. 1. Lateral X-ray of the head showing intracranial air and metallic portions of a ball point pen.
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tracted intact. The eyeball was very soft and it had been displaced in an outward and upward direction. Rupture of the eyeball, however, had not occurred.

Except for transient headaches and nausea, and apparent permanent blindness in the right eye, no neurological sequelae occurred. Penicillin and streptomycin were administered. Skull films obtained 10 days following the injury showed no residual air. Ophthalmoscopy indicated marked pallor of the right optic nerve head. Psychiatric care was required.

Comment

In 1944, Slaughter and Alvis reported a case of a 3-year-old girl who had fallen while carrying a pencil. Later a scar of the right upper eyelid and an orbital infection were noted, and x-rays showed a pneumoencephalocele. Direct entrance of air at the time of injury, entrance of air from an injured paranasal sinus, and activity of gas forming bacilli were possible mechanisms.

In the present case, the prompt radiographic appearance of pneumoencephalus was unusual. We believe that entrance of air was direct and along the shaft of the pen. Location of the tip of the pen posterior to the optic foramen in the cisterna chiasmatis, or in the third ventricle, and a valve mechanism at the same site are suggested pathogenic factors.

Summary

A case is presented of pneumocephalus following insertion of a ball point pen into the right orbit.

References