A late-onset seizure in a child due to intracranial needle

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Abstract

Placing of sewing needles in the brain through the anterior fontanel is a rare entity. There are very few cases reported in literature. Most of them were asymptomatic, but some of them presented with seizure. We report here a 14-year-old boy, who was admitted to the Pediatric Neurology Department with a history of generalized tonic-clonic seizures due to sewing needle located in the frontal lobe.

Introduction

Intracranial foreign bodies such as needle, wooden and bullets are generally due to penetrating injuries through the orbita, ear or cranial bones or rarely forgotten surgical objects in the brain during surgery.[1,2] Most of the cases were diagnosed incidentally and/or during evaluation for symptoms such as headache, epilepsy or altered behavior. Patients, who presented with seizure due to intracranial needles, were rarely reported previously.[3-7] We report a 14-year-old boy with epilepsy resulting from the presence of sewing needle located in the brain.

Case Report

A 14-year-old boy was admitted to the Pediatric Neurology outpatient department with a history of generalized tonic-clonic (GTC) seizures. There were no previous history of epileptic seizures, head trauma or injury and his family history was unremarkable. On admission his neurological examination was normal, there were no localizing neurological findings or lateralized weakness. All his biochemical and hematological tests were normal. His sleep/awake electroencephalography (EEG) recording was normal. After his second seizure sodium valproate treatment (20 mg/kg/day) was started. To determine etiology of seizures cranial magnetic resonance imaging was obtained and magnetic susceptibility artifact in right frontal region was seen (Figure 1). To reveal the nature of the object computed tomography (CT) was obtained, which showed a linear density compatible with a sewing needle surrounded with a local encephalomalacic area and calcification (Figure 2). Also, skull radiography demonstrated the presence of metallic opacity of a sewing needle, located in a cranio-caudal direction on the right frontal area (Figure 3). The patient and his family had no idea how the needle was introduced there. Based on the needle's location, we thought that it might have been inserted through the anterior fontanel during infancy. The needle was removed through a right frontal parasagittal craniotomy. The needle was encrusted with an irregular gliotic area (Figure 4). During the postoperative 8 months he was seizure-free with valproic acid treatment. Two months after discontinuing valproic acid treatment his seizure reoccurred and a spike wave activity in the right frontal region was determined in his EEG. In the two years' follow-up patient remained seizure-free with valproic acid treatment.

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Discussion and Conclusions

There are reports of sewing needles and other foreign objects retained in the brain for long periods of time without any symptoms. Since its first description in 1914, approximately forty cases have been reported all over the world, which were reviewed by Struiale *et al.*[5,8] In this review, about one third of patients with intracranial needles were asymptomatic and had been discovered incidentally. The most seen complaint was long time history of slight headache and secondly was seizure. Initial complaints such as fever, hemiparesis, extrapyramidal signs, cranial nerve palsy, hemi-chorea, brain abscess, nausea, vomiting,

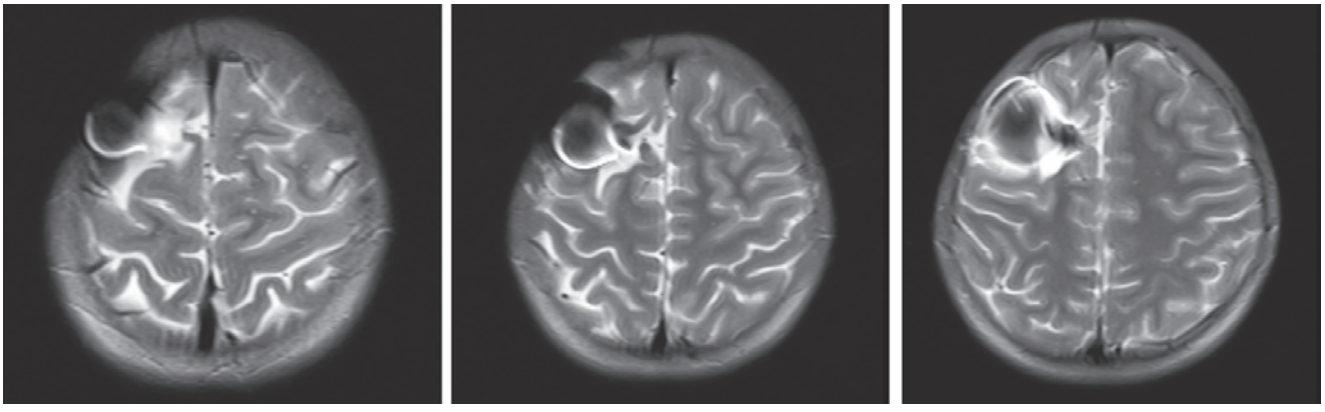

Figure 1. T2-weighted transverse magnetic resonance images show magnetic susceptibility artefact on right frontal region.

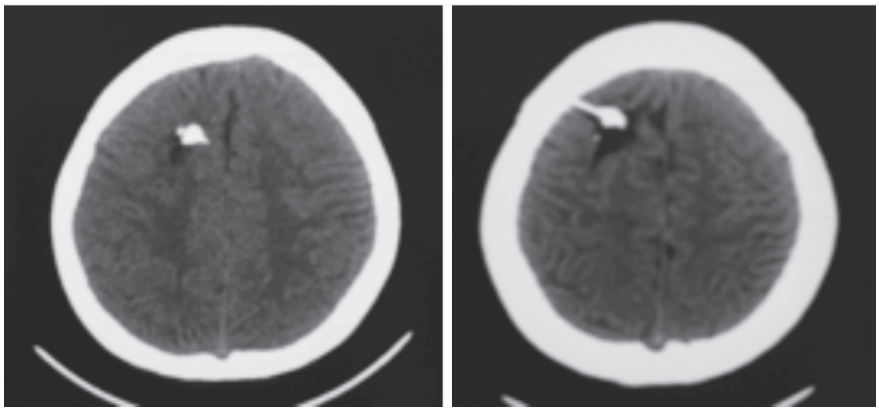

Figure 2. Transverse computed tomography images show the needle surrounded with a local encephalomalacic area in the right frontal lobe.

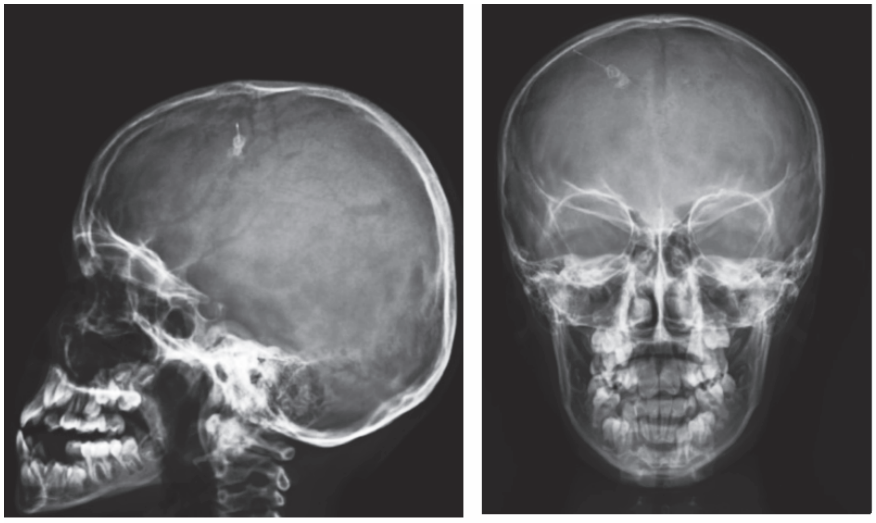

Figure 3. Lateral and postero-anterior skull radiographs show metallic opacity on the right frontal bone.

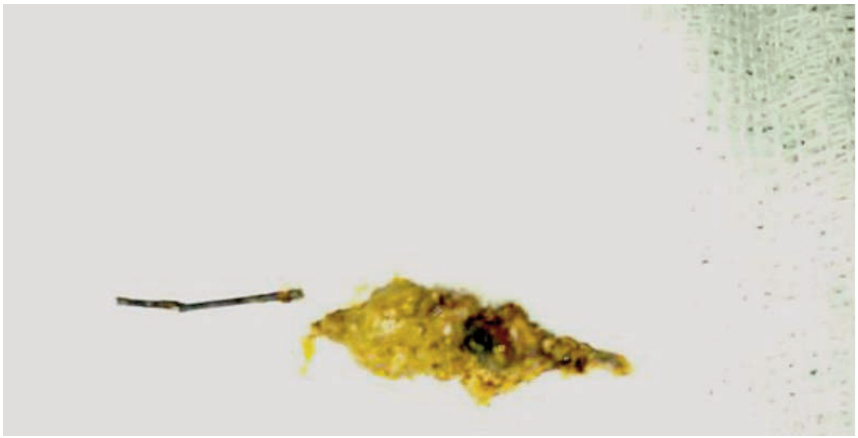

Figure 4. Photograph shows surgically removed needle and gliotic brain parenchyma around it.

lethargy, hemorrhage, meningitis and rarely hypothalamic syndrome had also been reported in this review.[5] None of these symptoms were detected in our patient except seizure.

The underlying pathophysiologic mechanism of seizures linked to intracranial foreign bodies is not clearly understood. Grafman *et al*. reported that persistent epilepsy after penetrating brain injuries is as high as 50% at 15 years after the injury, 85% in cases with longer follow-up.[9,10] Balak *et al.* hypothesized that the needle can function as an electric dipole and can be the main reason for epileptogenesis.[11] Although we could not identify any abnormality in his first awake/sleep EEG, his postoperative EEG showed spike wave activity in the same area with the needle in our case. Therefore we thought that the area of gliosis around the needle might be a possible reason for seizures then the needle. It is controversial whether surgical treatment is necessary or not. The most widely accepted approach is to follow-up without surgical removal when the patients have no clinical signs or symptoms and the diagnosis is purely incidental. The excision of the cortical scar tissue at the sewing needle entrance is highly recommended, especially if there are preoperative EEG abnormalities. Most of the patients with epilepsy become seizure-free after the surgery.[5] We preferred to remove the needle surgically because of the early presentation of the patient with seizure. Unfortunately his seizure continued after surgery. Most frequently, the patients and their relatives have no idea about how and when the needle was inserted. In most cases, as in ours, the needle presumably was introduced in infancy before the closure of the fontanels; therefore the patient cannot remember anything. Although it is thought that the needle inserted accidently, the conditions such as introduction of the needle by another child without the awareness of parents or other family members and child abuse should be strongly considered in these cases.[12]

In conclusion, although there are no clear-cut guidelines regarding the management of these foreign bodies, follow-up with antiepileptic treatment before surgery might be a reasonable approach to the patients with seizure.

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