Case reports

Posterior fossa subdural empyema in the term neonate

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Abstract. A case of posterior fossa subdural empyema following neonatal meningitis is reported. Computerized tomography (CT) carried out on the 11th day after birth showed an obstructive hydrocephalus with diffuse cerebellar swelling. Ventricular drainage was carried out to control the hydrocephalus and antibiotics were given intravenously. A second CT scan taken on the 21st day after birth revealed a loculated subdural empyema in the retrocerebellar space. Serial CT scans showed a diminution in the size of the empyema.

Key words: Term neonate – Posterior fossa – Subdural empyema – Bacterial meningitis.

Hydrocephalus frequently develops in infants who survive neonatal meningitis, with a reported incidence of 31% [9]. This may be a communicating hydrocephalus as a result of impaired absorption of cerebrospinal fluid (CSF) or an obstructive hydrocephalus due to obliteration of the aqueduct of Sylvius or the outlets of the IV ventricle [2]. However, a subdural empyema following meningitis in the posterior fossa has not previously been reported as a cause of neonatal hydrocephalus. This paper focuses on the clinical, diagnostic, and therapeutic aspects of this rare complication.

Case report

A full-term girl baby was delivered vaginally with vacuum extraction following premature rupture of the membranes 4 days before birth. Her birth weight was 2,520 g, and the Apgar scores at 1 and 5 min were 9. Culture of the vaginal mucus grew Escherichia coli. Maternal infection improved within 1 week after delivery. On the 5th day after birth, the baby developed a fever of up to 38.8 °C and separation of the cranial sutures was noticed. On the 7th day, CSF obtained by lumbar puncture contained 3,184 leukocytes/mm³ (90% lymphocytes, 10% neutrophils), 170 mg protein/dl, and 19 mg glucose/dl. No causative organism was isolated from the CSF or blood cultures. Antibiotic therapy was begun following a diagnosis of bacterial meningitis. Antibiotics were given intravenously for 4 weeks: 300 mg piperacillin/day for 2 days, 30 mg amikacin/day for 5 days, 16 mg gentamicin/day for 8 days, 450 mg latamoxef/day for 27 days, and 600 mg fosfomycin/day for 27 days. Immunoglobulin (250 mg) was given twice intravenously.

The initial CT scan taken on the 11th day revealed enlargement of the III and lateral ventricles, obliteration of the IV ventricle, and diffuse swelling of the cerebellum (Fig. 1). External ventricular drainage was instituted; the daily output of CSF ranged from 50 to 80 ml. Symptoms due to hydrocephalus improved soon after the drain was put in place. The second CT scan taken on the 21st day demonstrated a loculated low-density lesion with rim-enhancement, suggesting subdural empyema in the retrocerebellar space (Fig. 2). On the 29th day a ventriculoperitoneal (VP) shunt was carried out, because the fontanelle became tense several hours after clamping of the drainage tube and the repeated CSF examinations were negative. Serial CT scans showed diminution in the size of the empyema even after discontinuation of the antibiotic therapy. A CT scan taken on the 50th day showed that the subdural collection had almost disappeared (Fig. 3). At 3 months postpartum, the baby was in good health without neurological deficits.

Discussion

We report a newborn baby with posterior fossa subdural empyema associated with obstructive hydrocephalus. The characteristic features of this case may be summarized as follows: (1) Meningitis was most likely the cause of the subdural empyema, (2) the initial CT scan failed to show the empyema, and (3) systemic antibiotic therapy with CSF diversion procedures was an effective therapy.

Posterior fossa subdural empyema is a rare form of intracranial sepsis, usually complicating otorhinological infection, and constitutes approximately 10% of intracranial subdural empyemas [3, 12, 16, 17]. Although a subdural empyema is rarely produced by meningitis in children or adults, in infants it is sometimes a complication of meningitis [5], with an incidence of approximately 2% [7]. Furthermore, meningitis is most frequently seen in the 1st month of life [15]. Therefore, a posterior fossa subdural empyema should be considered as one of the possible causes of postmeningeal hydrocephalus, and it should be kept in mind that a careless lumbar tap can lead to sudden death by tonsillar herniation.
Fig. 1. CT scans taken on the 11th day after birth, showing an obstructive hydrocephalus with diffuse cerebellar swelling.

Fig. 2. Serial CT scans showing a gradual diminution in the size of the subdural empyema. The number indicates the day after birth when each CT scan was taken.

Fig. 3. Relationship between CSF analysis, CT findings, and antibiotic therapy. CC, cell count; PROT, protein; GLU, glucose; V-DRAINAGE, ventricular drainage; VP SHUNT, ventriculoperitoneal shunt; PIPC, piperacillin; AMK, amikacin; GM, gentamicin; LMO5, latamoxef; FOM, fosfomycin.