

lowed by acute cerebellar motor dysfunction, with trunk hypotonia, ataxia and intentional tremor.³ Differently from usual acute cerebellitis, mutism is the most characteristic finding of cerebellar involvement associated to RV infection,³ and follows consciousness disturbance. Otherwise, cerebellar mutism is a well-known complication of *posterior fossa* surgery, in which cerebellar injury produces impaired coordination of the articulatory muscles resulting in mutism that can be considered an extreme form of dysarthria or anarthria.⁴ RV-associated mutism is reported to last from some days to months, with a mean duration of about 1 month.³

As regards the other neurological manifestations associated to RV infection, our patient developed acute consciousness alteration and hypertonia some days after the onset of fever and repetitive vomiting, indicative of incoming encephalopathy, as confirmed by the EEG. Later on, subacute hypotonia, dysmetria and mutism suggested the cerebellar involvement, corroborated by MRI results showing hyperintensity of cerebellar peduncles and dentate nuclei. The association between peculiar clinical and imaging features along with the detection of RV antigen in stools let us diagnose RV-associated encephalopathy and concomitant cerebellitis even if it was not possible to detect RV antigen nor RNA in the CSF, as reported in other cases.³

To date, the pathogenesis of neurological signs of RV infection is not clearly understood. Inflammatory swelling of the cerebellum might compress the brain stem and may induce alterations of consciousness, which can mask the initial stage of cerebellar symptoms, as occurred in our case. One possible explanation of the Central Nervous System affection is RV direct invasion: in this case, its RNA or antigen might be found in the patient's blood or CSF. Anyway, nor RV antigen nor PCR are always positive in patients with encephalopathy associated with RV gastroenteritis. In such cases, the RNA or antigen amount could be too low to be detected, otherwise the Central Nervous System involvement could be due to indirect effect of RV.¹ The virus is supposed to damage enterocytes through toxinlike proteins such as the non-structural protein 4 (NSP4) and/or by the stimulation of the enteric nervous system.⁵ These might result in increased nitric oxide metabolites in blood and CSF, which could almost partially explain the neurological impairment through their high radicals activity, as reported in subjects with RV gastroenteritis-induced seizures.¹ Another possibility is the dissemination of the virus by the enteric nervous system, but again no demonstration has been provided yet.¹ A deeper comprehension of the pathogenesis is needed in order to enhance therapy. In particular steroids have been proposed by many authors, but there is not any evidence of which protocol could be more effective.

In conclusion, though rare, cerebellitis should be considered a possible feature of RV infection with concomitant encephalopathy and shows typical clinical and radiological features.

On the other hand, RV involvement should be considered when mutism occurs in children with cerebellitis, even when the virus is not detected in CSF or blood.

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Massive subcutaneous emphysema and pneumomediastinum, an underestimated clinical sign of child abuse

Dear Editor,

Abuse is the third leading cause of mortality in children aged under four years.¹ Up to 50% of patients suf-

fer repeated abuse and up to 20% of abused children who die have been previously assessed in emergency care units.² Many difficulties are encountered in diagnosing abuse, one of which is the many forms its presentation can take. Studies have described clinical findings, anamnesis and socioeconomic circumstances of the family that should raise suspicions; but unfortunately, there is no validated system for the early detection of patients who may be at risk of abuse. Massive subcutaneous emphysema as a sign of physical abuse is extremely rare. Despite the massive nature of emphysema, the clinical tolerance of patients is generally good and etiological studies are unlikely to be performed, given the satisfactory outcome normally achieved without treatment. However, diagnosing the cause of emphysema can be of vital importance and sometimes multiple imaging and endoscopic studies must be conducted, which can lead clinicians to suspect that the emphysema is an indication of abuse, as in the case presented here.

An infant aged two months was admitted to the emergency room with a large cervicofacial and cranial swelling, of acute onset. According to the medical history, the infant had been premature, with a birth weight of 2300 g. She had been admitted to hospital one month after birth with catarrhal symptoms and apnea. Obstetric fracture of the right clavicle was diagnosed when physical examination revealed the swelling of the fracture callus. The family background was as follows: the parents were healthy, young (mother aged 18 years, father aged 20 years), both unemployed, with basic educational qualifications and no known source of income. Physical examination revealed swelling and crepitus on palpation in the laterocervical, facial, periorbital and left parietal regions, very extensive soft tumoration in the right parietal region, left eyelid edema restricting the opening of the eye, and superficial abrasions to the neck, supraorbital area and left nostril. In addition, there were faded hematoma in the left hemiabdomen, as well as bilateral swelling and crepitus in the neck and in the right shoulder. The nutritional status and the personal hygiene were both poor. Cardiopulmonary auscultation revealed muffled, rhythmic heart sounds, with no abnormal sounds, and a normal, symmetrical vesicular murmur. The infant cried loudly in response to physical examination. There were no other relevant clinical findings. Neck and chest x-ray examination revealed extensive subcutaneous emphysema and pneumomediastinum. Although the patient was hemodynamically stable and presented no respiratory distress, she was admitted to intensive care for observation, in view of the risk of progression of the emphysema and/or pneumomediastinum. The parents denied the occurrence of any trauma or other circumstance accounting for the findings, and so the following complementary studies were conducted to determine the cause of the massive emphysema:

— scan of head and neck revealed extensive subcutaneous emphysema, in the face and scalp, in the left orbital and periorbital and bilateral occipital areas, and

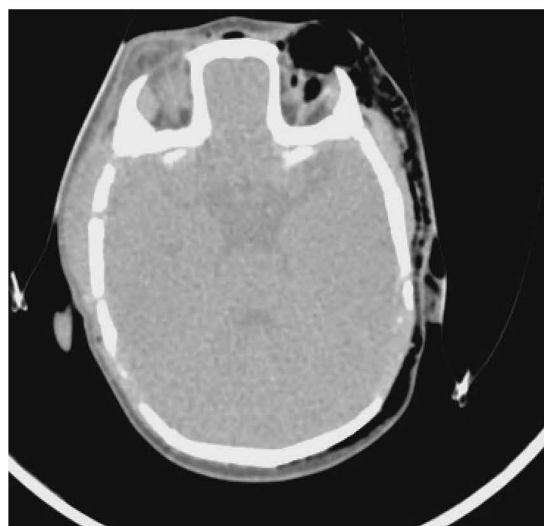


Figure 1.—The head and neck scan showed subcutaneous emphysema in the face and scalp. Exophthalmos in the left orbital and right parietal subgaleal hematoma were revealed, as well.

in the left exophthalmos. Moreover, there was a large right parietal subgaleal hematoma, with no intracranial injury or fracture lines (Figure 1);

— bone map: the cervical and limb radiographs were normal, revealing three thoracic rib consolidated fractures of the posterior arches (9th and 10th right ribs, 9th left rib) and a consolidated fracture of the right clavicle. Bilateral cervical subcutaneous emphysema and pneumomediastinum were also observed;

— ocular fundus: normal;

— maxillofacial scan: no maxillofacial fracture or orbital wall lesion was observed, and so these were rejected as causes of the emphysema;

— fiber optic laryngoscopy: it proved impossible to pass the fiberscope through the right choana due to the large edema obstructing the passage. Crusted lesions and bloody remains in the mucosa were observed.

On suspecting that the emphysema may have been caused by the insufflation of air into the nasal passage, the parents were again interviewed, and they claimed to have applied suction with a manual neonatal device to remove secretions and relieve cold symptoms. However, they were unable to rule out the possibility of having applied insufflation instead of suction. The case was reported to the Social Services, who immediately withdrew custody of the child from the parents.

Subcutaneous emphysema and pneumomediastinum may appear in diverse clinical situations in which there is disruption of the skin-mucosal barrier, within the oropharyngeal, digestive or respiratory systems.³ Our review of the literature revealed only one case in which the cause of subcutaneous emphysema and pneumomediastinum was the disruption of the oropharyngeal barrier as the result of nasal in-

sufflation using a secretion aspiration device.⁴ Therefore, the case in question might be an extremely rare manifestation of abuse; in most cases, spontaneous subcutaneous emphysema in children is intuitively attributed to a Valsalva manoeuvre, coughing or excessive crying and crying and not as extensive as in the reported case. The fact that subcutaneous emphysema usually has a benign course and resolves spontaneously in most patients⁵ may influence the physician's decision not to perform complementary endoscopic or radiological examinations to corroborate the diagnosis. Accordingly, patients may be underdiagnosed as potential victims of abuse. Therefore, in patients with subcutaneous emphysema of unknown cause, we suggest great care be taken in obtaining the medical history from parents or guardians. The information provided should be carefully checked, and if any inconsistencies are observed, a thorough causal diagnosis of the emphysema should be made, taking into account the possibility that the patient may have been abused.

Note that a comprehensive education to parents regarding secretion aspiration devices prior to discharge may also help them prevent the occurrence of these events.

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