Clinical Case Reports

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Intracranial Hypertension Syndrome Secondary to Intraventricular Hemorrhage: A Case Report

Rodrigo Inácio Pongeluppi[1], Matheus Fernando Manzolli Ballestero[1,2], Ricardo Santos de Oliveira[1]

[1] Division of Neurosurgery, University Hospital, Medical School of Ribeirão Preto, University of São Paulo, Ribeirão Preto, São Paulo, Brazil

[2] Medicine Department, Federal University of São Carlos, São Carlos, Brazil, São Paulo, Brazil

✉ Rodrigo Inácio Pongeluppi, MD

e-mail: rodrigopongeluppi@gmai.com

Available at:
http://www.archpedneurosurg.com.br/

Introduction/Backgound: Acute intracranial hypertension (ICH) syndrome is a neurosurgical emergency. Timely diagnosis of ICH is imperative for potential reversibility of the neurological condition. We report the case of a child with bleeding and hydrocephalus secondary to lateral ventricle injury, with an emphasis on the outcome secondary to ICH.

Case Report: A 10-year-old girl presented to the emergency department with a history of progressive holocranial headache and vomiting for 1 day. She progressed with a progressive decrease in the level of consciousness. A computed tomography scan of the head was performed only 12 hours after admission, revealing intraventricular hemorrhage associated with calcifications and ventricular dilation. Upon admission to a specialized service, she had bilateral fixed mydriasis and the absence of brainstem reflexes. Emergency ventriculostomy was performed, but the patient developed brain death the following day.

Conclusion: Besides the delay in diagnosis, the time between diagnosis and emergency neurosurgical treatment also constituted a significant factor in the unfavorable outcome described. In many ICH situations, a simple procedure like ventriculostomy can prevent an unfavorable outcome. Therefore, proper evaluation of pediatric patients and early recognition of clinical signs indicating intracranial

Keywords: intracranial hypertension, medical emergency, brain tumor

INTRODUCTION

Intracranial hypertension (ICH) syndrome results from brain injury, leading to a set of changes observed in medical evaluation. Acute ICH is a neurosurgical emergency. When natural compensatory homeostatic mechanisms are overwhelmed, herniations and other complications may arise, causing coma and death (1). ICH can occur in the presence of expanding brain lesions, hemorrhages, ischemia, traumatic brain injury, and hydrocephalus (2).

Brain neoplasms can present with spontaneous bleeding, cysts, and obstruction of the cerebrospinal fluid pathway, potentially causing acute ICH if not timely treated (3).

Timely diagnosis of ICH is imperative for potential reversibility of the neurological condition. In many cases, initial care is provided in emergency units by general practitioners. We report the case of a child with bleeding and hydrocephalus secondary to lateral ventricle injury, with an emphasis on the outcome secondary to ICH.

CASE REPORT

A previously healthy 10-year-old girl presented to the emergency department with a history of progressive holocranial headache and vomiting for 1 day. She had been seen at the same emergency department the day before, received symptomatic treatment, and was discharged.

Upon admission, she had severe headache, confusion, and incoherent speech, progressing to a gradual decrease in the level of consciousness overnight. She underwent orotracheal intubation the following day, and a computed tomography scan of the head was performed only 12 hours after admission, revealing intraventricular hemorrhage associated with calcifications and ventricular dilation (Figure 1).

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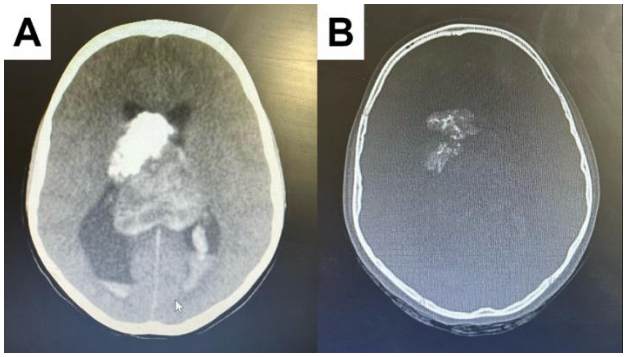

Figure 1- Axial computed tomography scans of brain parenchyma (A) and bone (B) show a heterogeneous intraventricular lesion with calcifications.

Specialized neurosurgical care was contacted, and the patient was admitted at 5:30 PM, more than 24 hours after the onset of ICH signs and symptoms and 5 hours after orotracheal intubation.

On admission, she had bilateral fixed mydriasis and the absence of brainstem reflexes. Glasgow Coma Scale score was 3. Emergency ventriculostomy was performed, but the patient progressed to brain death the following day.

DISCUSSION

The main symptoms of acute intracranial hypertension are altered level of consciousness, changes in heart rate and respiratory pattern, visual disturbances, nausea, vomiting, and headache (1). Clinical suspicion and evaluation of warning signs of intracranial hypertension should be early, especially when symptoms are nonspecific, such as headache (2).

Several protocols for evaluating headaches in children exist since some warning signs should prompt early consideration of secondary causes. In the described case, the child initially presented with progressive headache, progressing to vomiting and altered behavior. These warning signs should have prompted neuroimaging, which did not occur in this case (4).

The child had a progressive course, eventually leading to altered consciousness and intubation. At this point, a head CT scan was performed, revealing a ventricular neoplasm with bleeding and hydrocephalus and signs of sulcal and gyral effacement in brain parenchyma.

Tumors located in the lateral ventricles of the cerebral hemispheres represent less than 1% of all intracranial tumors (5). There is a risk of severe complications, such as bleeding and hydrocephalus, even in previously healthy patients (6,7).

In the described case, the proposed treatment of ventriculostomy installation was delayed in a situation of irreversible neurological damage. Treatment timing is crucial, as intracranial hypertension progression after the decompensation time can be only a few minutes or hours, with numerous cases of sudden death reported (8–11).

Therefore, in addition to the delayed diagnosis, the time between diagnosis and emergency neurosurgical treatment also constituted a significant factor in the unfavorable outcome described. Brazil is a country with vast geographical dimensions, and transportation to a specialized neurosurgical center can take hours via roads, rivers, or even air travel, depending on the region.

The objective of this article is to emphasize the importance of early diagnosis of intracranial hypertension. Although the novelty of our case is not noteworthy, the fact that such a catastrophic outcome occurred with a patient treated in a private healthcare system alerts us to the need to raise awareness on the topic.

CONCLUSION

In many cases of intracranial hypertension, a simple procedure like ventriculostomy can prevent an unfavorable outcome. Thus, proper evaluation of pediatric patients and early recognition of clinical signs indicating intracranial hypertension are crucial to prevent an unfavorable and potentially fatal outcome.

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Not applicable

DISCLOSURES

Ethical approval

This study was performed in line with the principles of the Declaration of Helsinki.

In instances where case reports involve participants who remain completely unidentified, submission to an ethics committee for approval is not required

Consent to participate

The patients gave consent to use their information and images for research purposes. *Consent for publication*

The patient gave consent to use his information and images for publication.

Conflict of interest

The authors report no conflict of interest concerning the materials or methods used in this study or the findings specified in this paper.

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CONTRIBUTIONS

-**Rodrigo Inácio Pongeluppi**: Conceptualization, Data curation, Formal Analysis, Investigation, Methodology, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing
-**Matheus Fernando Manzolli Ballestero**: Conceptualization, Validation, Writing – original draft, Writing – review & editing
-**Ricardo Santos de Oliveira**: Conceptualization, Formal Analysis, Methodology, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing

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