Juniper Online Journal of Case Studies
ISSN: 2476-1370

Juniper PUBLISHERS key to the Researchers

Case Study
Volume 13 Issue 5 November 2022
DOI: 10.19080/JOJCS.2022.13.555874

JOJ Case Stud

Hematoma of Brainstem Post Electrization: About a Case and Review of the Literature

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Submission: October 17, 2022; **Published:** November 02, 2022

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Summary

Electric current remains one of the most deleterious physical agents on nervous tissue. Cerebral hemorrhages secondary to an electrification accident by low-voltage electric current are very rarely reported in the literature and are often the prerogative of children. We report a case of ponto-bulbar hemorrhage by low voltage electric current in Abidjan, Côte d'Ivoire.

Keywords: Electrification; Cerebral hemorrhages; Nervous tissue; Hemicorporal pyramidal syndrome; Cerebral lesions; Neurological morbidity

Introduction

Electrification defines all the organic manifestations related to the passage of electric current through the human body [1]. Neurological damage is a common complication. Electricity on brain tissue is responsible for both central and peripheral conditions [2]. Severe vascular damage can occur, weakening the vascular walls, making them prone to spontaneous rupture [1,3]. These are under-diagnosed accidents due to the lack of consultation in the face of domestic electrification accidents and the often benign and transient nature of the lesions observed [4,5]. The literature reports several cases of cerebral hemorrhage after electrification, but very few concern the brainstem following domestic electrification [6]. We report a case of brainstem hemorrhage revealed by a unilateral motor deficit caused by an electrification accident by domestic electric current observed in an 11-year-old child in Abidjan, Côte d'Ivoire. The singularity of our observation lies in the topography of the lesions in front of a presumed low voltage electric current.

Observation

This is the 11-year-old child A.I., a student, who was admitted for cerebral-type vomiting with a left hemicorporal motor deficit of sudden onset following an electrification at home. The anamnesis does not find any particular history, a history dating from 24 hours before his admission. The day before at noon, the child after washing his hands, wanted to turn on the television. The contact between the moist hand and the bare wire in places had the effect of electrifying the child then projecting it with reception on the buttocks. He is accompanied by his parents to the nearest peripheral health structure where, after evaluation, he returns home. The next day, the child complained of odynophagia and exhibited easy projectile vomiting. He is referred to the attached tertiary centre. On admission, he has no skin lesions in favor of points of entry and exit of electrical current. The examination revealed a flaccid right hemicorporal pyramidal syndrome. The child performs a cranio-encephalic CT scan which shows an expansive-looking pontine hematoma and benefits from three-weekly motor physiotherapy sessions. The following days are marked by the onset of dysphagia to solids and dysarthria. The ENT consultation is of little contribution and the magnetic resonance imaging (MRI) performed five days after the CT scan reveals a left ponto-bulbar hematoma (see Figure 1 & 2). The management was symptomatic and the evolution at one month is marked by the significant regression of the hemiplegia and the persistence of the dysarthria.

Discussion

In low-voltage electrification accidents, children are often affected because they constitute the population affected by

domestic accidents [6]. The entry and exit points are not constant and their absence does not indicate the absence of electric current. The type of voltage as well as the nature of the tissue involved plays a determining role in the type of lesion observed. Thus, low voltage and domestic alternating current, i.e., 120 to 220 volts, generally described as less than 1000 volts, is often associated with brain damage [7]. This is all the more frequent as the nervous tissue constitutes with the muscles and the blood vessels the tissues least resistant to electric current [8,9]. Our patient presented with right hemiparesis, an infrequent neurological manifestation in children [7]. Cerebral lesions show a delay in the onset of cerebral hemorrhage of 3 to 5 days, as was the case in our patient [6]. The progressive constitution of the hematoma could explain the chronology of the signs on the one hand and the topographic extension between the scanner and the MRI of our patient. In addition, there remains a doubt as to the etiology of this hemorrhage; Could it be a hematoma following the notion of projection or following a malformative rupture? The absence of CT angiography makes it difficult to decide. This etiological difficulty was also mentioned by the cases of Bugeme & Chaibdraa [4,5]. Moreover, the favorable evolution was found by Chaibdraa [5].

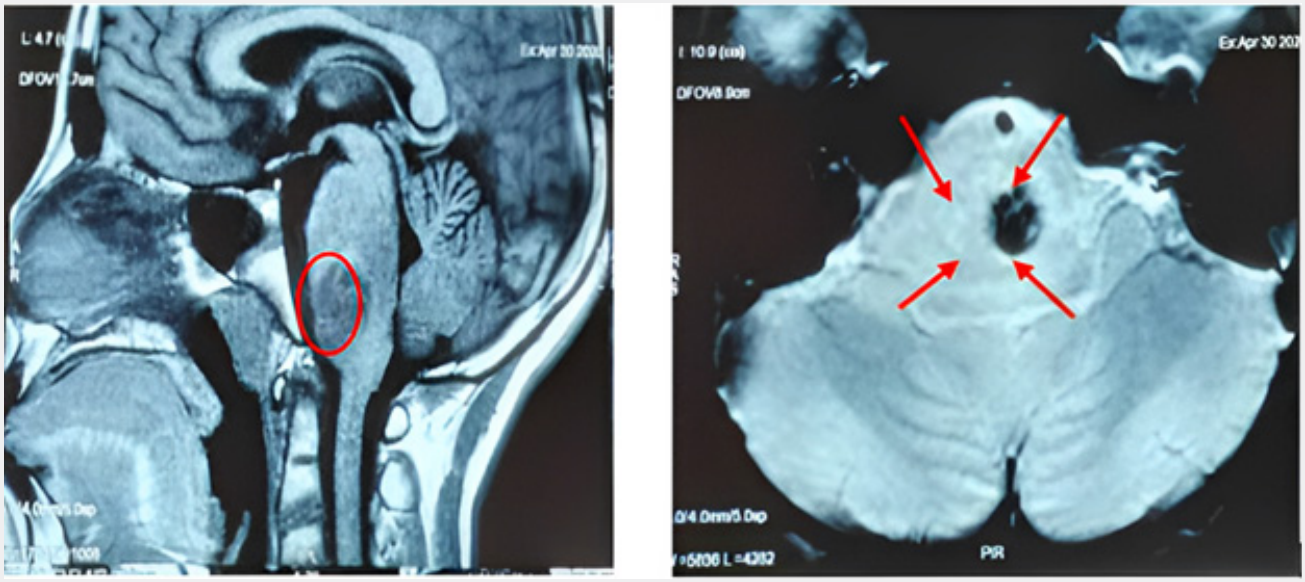

Figure 1 & 2: Flair MRI appearance of a semi-recent right bulbo-ponto-bulbar hematoma with perilesional edema in coronal section (Figure 1) and transverse section (Figure 2).

Literature review: Concerning electrification, there are no randomized double-blind trials available. The majority of information comes from isolated cases, case series and experimental animal models, with few articles available. Neurological morbidity is variable, ranging from late discovery of lesions without complete recovery to almost ad-integrum resolution of motor deficits [10,11]. Multidisciplinary management approaches are required to achieve the best possible results. Long-term neurological follow-up is warranted by the wealth of evidence of late complications cited in the literature [12].

Conclusion

A true neurological emergency, electrification accidents in children are infrequent, requiring above all adequate imaging and multidisciplinary care. Prevention through awareness-raising remains essential, through the securing of electrical installations and above all the awareness-raising and education of children and their entourage on the dangers of electric current.

References

1. Chaibdraa A, Medjellekh MS, Bentakouk MC (2009) Electrisation - Electrocution. Ann Burns Fire Disasters 22(1): 22-32.
2. Laguerre J, Conil JM, Favarel H, Brouchet A, Grolleau JL, et al. (2000) Effets de la foudre sur l'organisme humain, illustrés par des cas cliniques. Ed Carr Méd: Brûlures 1: 9-18.
3. Axayacalt GA, Alejandro CE, Marcos RA, Inocencio RF, Alfredo HG (2016) Brain hemorrhage after electrical burn injury: Case report and probable mechanism. Surg Neurol Int 7(Suppl 28): S759-S762.
4. Bugeme M, Mukuku O (2014) Manifestations neuropsychiatriques révélant une hémorragie cérébro-méningée causée par un accident d'électrisation : à propos d'une observation et revue de la littérature. Pan African Medical Journal 18: 201.
5. Chaibdraa A, Medjellakh MS, Saouli A, Bentakouk MC (2008) Accident D'Electrisation et Hemorragie Cerebro-Meningée : A Propos D'une Observation. Ann Burns Fire Disasters 21(3): 133-137.
6. Johl HK, Olshansky A, Beydoun SR, Rison RA (2012) Cervicothoracic spinal cord and pontomedullary injury secondary to high-voltage electrocution: a case report. J Med Case Reports 6: 296.

How to cite this article: Essoin De Souza NT, Agbo Panzo C, Amon-Tanoh M, Diakité I, Abbé S, et al. Hematoma of Brainstem Post Electrization: About a Case and Review of the Literature. JOJ Case Stud. 2022; 13(5): 555874. DOI: 10.19080/JOJCS.2022.13.555874

7. Claudet I (2009) Électrisation de l'enfant. CAT en pré hospitalier et aux urgences chez un enfant noyé, électrisé, brûlé 220-231.

8. Kim HM, Ko YA, Kim JS, Lim SH, Hong BY (2014) Neurological Complication After Low-Voltage Electric Injury: A Case Report. Ann Rehabil 38(2): 277281.

9. Kokatnur L, Rudrappa M (2016) Acute Stroke due to Electrocution: Uncommon or Unrecognized? Case Rep Neurol Med 2016: 9510863.

10. Ko SH, Chun W, Kim HC (2004) Delayed spinal cord injury following electrical burns: a 7-year experience. Burns 30(7): 691-695.

11. Kingsly PA, Dhanraj P, Gupta A (2008) Recovery after spinal cord injury due to high tension electrical burns: a 5-year experience. Burns 34: 888-890.

12. Cherington M (1995) Central nervous system complications of lightning and electrical injuries. Sem Neurol 15(3): 233-240.

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