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Case Report

Stroke in a Six Month Old Infant with Multiple Intracerebral Infarcts: A Case Report

Muhammad Sule Baba[1], Ma'aji Sadisu Mohammed[1], Sa'idu Sule Ahmed[1], Shamaki Amina Muhammad Bello[1], Usman Aminu Umar[2].

[1]Department of Radiology, Usmanu Danfodiyo University, Sokoto.
[2]Department of Radiology, Gombe State University, Gombe.
Corresponding Author Email: muhammadsule@yahoo.com

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Abstract: The World Health Organization (WHO) defines stroke as a clinical syndrome of rapidly developing focal or global disturbance of brain function lasting more than 24 hours or leading to death with no obvious nonvascular cause. This is a six month old infant that was referred for a contrast enhanced computed tomography (CECT) of the brain on account of occasional vomiting, lethargy, poor suckling, weakness, poor developmental milestones since birth. The CECT showed a J-shaped sella, gnatopathy, multiple non-enhancing cerebrospinal density spaces; chronic infarcts, prominence of the lateral ventricles, poor white-grey matter interphase and a cleft palate. The parents of the patient were advised to seek referral for a multidisciplinary form of clinical management in a tertiary institution for better quality of life of the patient. We report the radiographic features of stroke in the pediatric age group due to its rare nature.
Keywords: J-shaped sella, Cerebral infarcts, Seizures, Pediatric.

Introduction

Stroke in the pediatric age group is relatively rare and has an estimated incidence of about 2.5-13 per 100,000 per year, however this remains one of the most common causes of death in childhood with an approximated mortality rate of 0.6 per 100,00 death/year[1-4]. The World Health Organization (WHO) defines stroke as a clinical syndrome of rapidly developing focal or global disturbance of brain function lasting more than 24 hours or leading to death with no obvious nonvascular cause[5,6].

Ischemic or infarctive stroke includes arterial ischemic stroke (AIS) and cerebral sinovenous thrombosis, the arterial ischemic stroke is more prevalent among black race and male gender[1]. Vasculopathies like transient cerebral arteriopathy, arterial dissection, fibromuscular dysplasia and Moya-Moya disease (MMD) have been recognized in 18%-80% of children with AIS[1,7]. The most common arteriopathy associated with pediatric stroke is the transient cerebral arteriopathy (TCA), a monophasic arterial disease characterized by unilateral focal or segmental stenosis involving the distal aspect of the internal carotid and proximal part and branches of the anterior and occasionally middle cerebral artery, this is often followed by complete or partial reslution[1,8].

Infectious agents may frequently cause TCA, these are Parvovirus B19, Cytomegalovirus, *Mycoplasma pneumonia*, *Borrelia burgdorferi*, Enterovirus, Human Immunodeficiency virus (HIV) and *Helicobacter pylori*[1]. Sickle cell disease is the most common hematologic risk factor for pediatric stroke, the disease is characterized by deoxygenated hemoglobin acquiring higher density making red blood cells susceptible to sickle, and the patients have lots of neurologic complication like cerebral infarction[1,9].

Moya-Moya disease is described as a bilateral and progressive stenosis of the arteries of circle of Willis eventually causing vascular insufficiency or repeated ischemic episodes despite formation of collateral blood flow[1,10]. Pediatric stroke may present as seizures, headaches, language and speech difficulties, altered mental status, ataxia, vertigo, vomiting, lethargy and apnea with or without focal neurologic deficits[1, 7, 11, 12].

Case Report

This is a six month old male infant referred to the Radiology department for a contrast enhanced computerized tomography (CECT) of the head on account of delayed milestones, reduced and poor muscular activity for his age, poor and uncoordinated suckling of breast/feed with associated irritability, lethargy, vomiting and cloudy cornea. The mother had delayed onset of antenatal visit with ingestion of drugs and local herbs during the index pregnancy. The parents happen to be of the AS genotype each and the mother admitted that the index case was of the Hb-SS genotype. She is P_5^{+0} all alive.

The physical examination showed a child appearing lethargic with normal head circumference, gnatopathy, oriented in person, not pale, not dehydrated, not in respiratory distress, normal pulse and respiratory rates with low grade of power (grade; I-II), weakness of the joints. The CECT showed; normal skull vault and elongation of the sella "the J-shaped sella" on scout image and gnatopathy (Figure 1). Ventriculomegaly involving all the ventricles, prominence of the gyri and sulci, poor grey-white matter differentiation and multiple non-enhancing cerebrospinal fluid (CSF) density (Hounsfield unit=5) collections (chronic infarcts) of varying sizes in both cerebral hemispheres (Figure 2). These areas were not demonstrated in the cerebellum and brain stem. Lower cuts of the CECT showed a cleft palate (Figure 3). Spinal x-rays show normal findings. Complementary transfontanelle scan showed multiple oval hypoechoic areas in the cerebral hemispheres with associated minimal prominence of the demonstrated ventricles. The result of the CECT and complementary transfontanelle scan were made available to the parents and advised to discuss possible referral of the child by the referring physician to a tertiary centre where a multidisciplinary management will be made available for a better outcome.

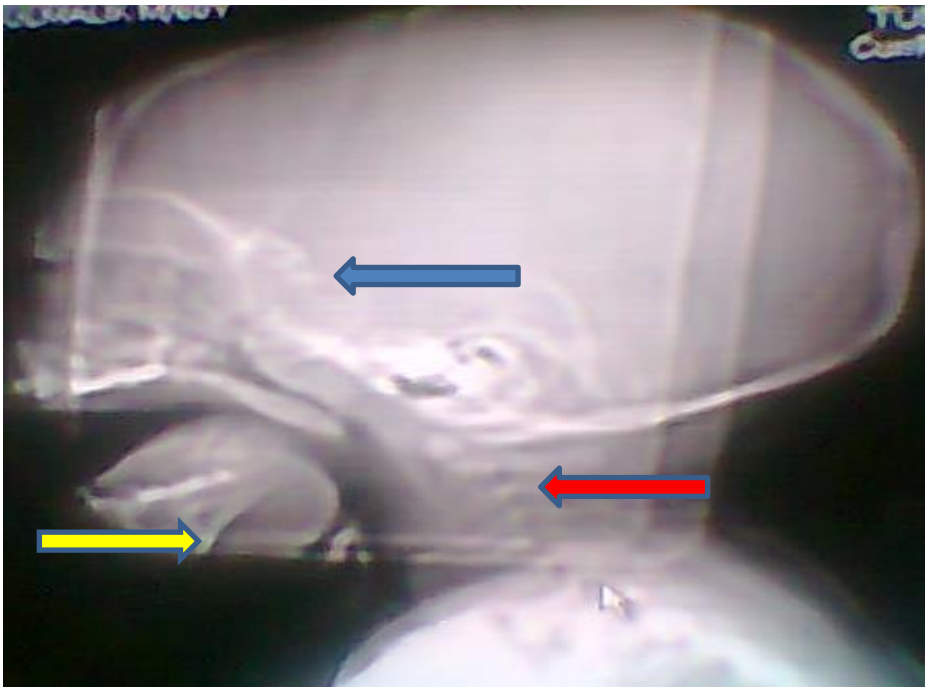

Figure 1. Scanogram/scout image of CECT scan of the brain showing the so called J-shaped sella (left blue arrow), foreshortened lower jaw; gnatopathy (right yellow arrow) and normal cervical spine (left red arrow).

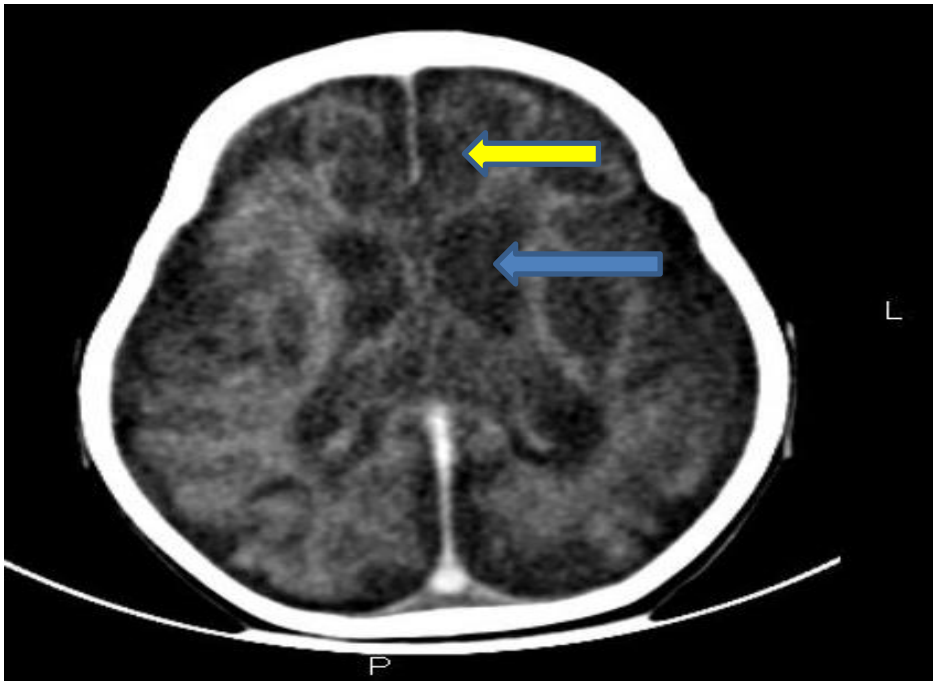

Figure 2. Axial image of the brain following an enhanced computed tomographic scan at the level of the lateral ventricles showing: prominence of the lateral ventricles (left blue arrow) and multiple CSF density spaces (left yellow arrow) in both cerebral hemispheres with poor grey-white matter interphase.

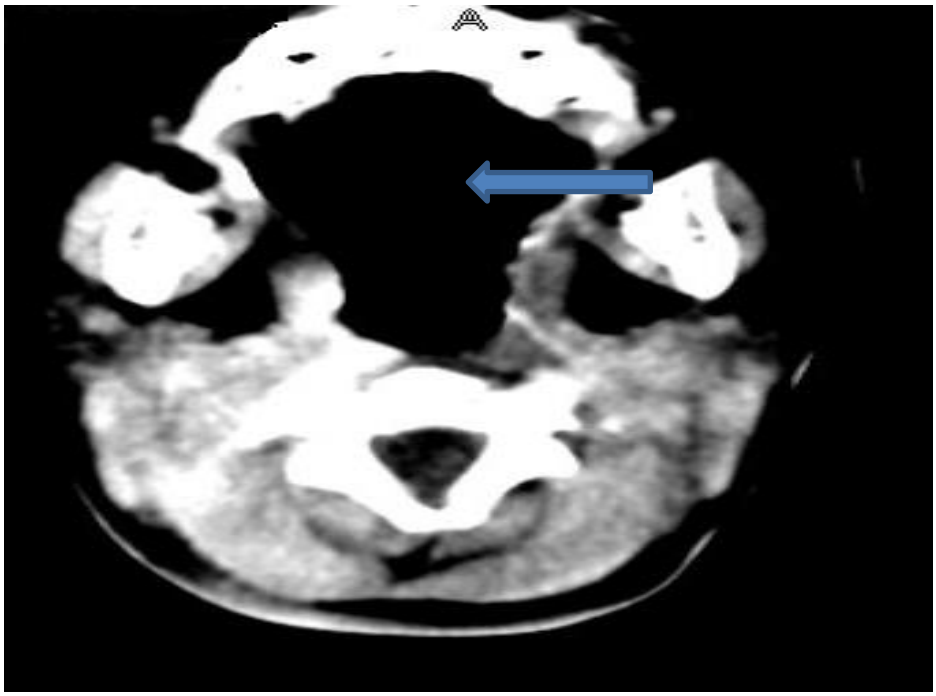

Figure 3. Lower slice of the CECT of the upper jaw showing cleft palate (left blue arrow).

Discussion

Ischemic or infarctive stroke includes arterial ischemic stroke (AIS) and cerebral sinovenous thrombosis, the arterial ischemic stroke is more prevalent among black race and male gender[1]. The index case presented with multiple cerebral infarcts, the case happens to be a male and of the black race conforming to this literature. Transient ischemic attacks are sudden, focal neurologic deficit that lasts for less than twenty-four hours and often of vascular origin confined to an area of the brain or

eye perfused by a specific area[5,13]. Furthermore imaging shows area of cerebral infarction in childhood even with transient symptoms[5,14]. The index case had multiple areas of cerebral infarcts and presented with persisting symptoms since birth in keeping with established ischemic stroke.

Some cases of pediatric stroke may be congenital and often associated with congenital heart diseases[1,15,16] and other congenital defects, the index case had no established congenital heart disease but had gnatopathy with cleft palate conforming to some literatures. Sickle cell disease is the most common hematologic risk factor for pediatric stroke, the disease is characterized by deoxygenated hemoglobin acquiring higher density making red blood cells susceptible to sickle, and the patients have lots of neurologic complication like cerebral infarction[1,9]. The index case also happens to be of the Hb-SS genotype; sickle cell disease patient and an infant of about six months of age.

Pediatric stroke may present as seizures, headaches, language and speech difficulties, altered mental status, ataxia, vertigo, vomiting, lethargy and apnea with or without focal neurologic deficits[1,11-13]. The present case also presented with some of these features like vomiting, lethargy, seizures and delayed milestones thereby conforming to these literatures.

Radiological imaging also play vital role in making diagnosis and establishing the cause of pediatric stroke, most important of which is magnetic resonance angiography (MRA), though the index case had a CECT that confirmed the presence of multiple cerebral infarcts conforming to some literatures. The index case had no MRA done due to its non-availability as at the time of this report. The management of pediatric stroke is multidisciplinary involving the neurosurgeons, pediatric neurologist and physicians with the physiotherapist, the parents of the index case were advised to discuss possible referral by the referring physician to a higher tertiary centre for a better care and management.

Conclusion

Pediatric stroke is a rare entity, patients with suspected features of stroke should be adequately investigated and evaluated clinically and subsequently advised on a multidisciplinary form of management for better quality of life.

Conflicts of interest: None declared.

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