Journal of Pakistan Association of Dermatologists. 2016;**26 (3)**:265-268.

Case Report

PHACE syndrome: A case report

Kehkshan Tahir, Aysha Umar Khan, Shahbaz Aman

Department of Dermatology, Services Institute of Medical Sciences/Services Hospital, Lahore

Abstract PHACE syndrome is relatively uncommon neurocutaneous disorder. It is an acronym which refers to posterior fossa anomalies, hemangioma, arterial lesions, cardiac abnormalities and eye anomalies. We report a case of five-month-old female infant with large segmental facial hemangioma and posterior fossa anomaly. Magnetic resonance imaging (MRI) scan of head and neck region with contrast revealed mixed type infantile hemangioma, hypoplastic right cerebellum and enlarged posterior fossa with CSF space. We treated the patient with propranolol 1mg/kg once daily and regular follow-ups were maintained and definite improvement was seen.

Key words
PHACE syndrome, infantile hemangioma, propranolol.

Introduction

PHACE/S is a syndromic form of infantile segmental hemangioma described by Friedon *et al* in 1996.[1] It is more common in females, almost 88% of PHACE infants are female.[2] The syndrome is an acronym, P = *P*osterior fossa brain malformation, H = *H*emangiomas, A= *A*rterial anomalies, C = *C*ardiac anomalies and coarctation of aorta, E = *E*ye anomalies and S = *S*ternal defects. PHACE syndrome infants are born to slightly older mothers and at a slightly older gestational age than other hemangiomas.[3] The diagnosis of PHACE syndrome requires presence of a facial hemangioma > 5cm plus one major criterion or two minor criteria (**Table 1**).[4]

Case Report

A 5-month-old female infant presented to us with history of multiple reddish plaques involving right side of the face, scalp and front of the chest since 4.5 months. Lesions evolved from faint red macules over right malar eminence, increased in size, became indurated and bright red. It progressively involved the right upper eyelid, frontoparietal, temporal, retroauricular, parotid and mandibular regions, lips and presternal area. There was no history of crusting, ulceration, discharge or bleeding from the plaques. The child was born through normal vaginal delivery to unrelated parents. She was vaccinated till date and milestones were attained according to the age. Cutaneous examination revealed multiple erythematous, non-pulsatile, blanchable plaques of irregular shapes with verrucous surfaces and well-defined margins involving right side of the face and pre-sternal region (**Figure 1**). Largest plaque measured 15 X 9.5 cm. There was no involvement of mucosae. There was no evidence of suprasternal clefting and supra umbilical raphe while the rest of general physical and systemic examinations were un-remarkable. Ophthalmological and cardiac consultations did not reveal any abnormality. MRI scan of head and neck region with contrast revealed mixed type infantile hemangioma, hypoplastic right cerebellum and enlarged posterior fossa with CSF space (**Figure 2**).

All other investigations including ECG, chest X-ray and echocardiography were normal.

Address for correspondence
Dr. Kehkshan Tahir
Department of Dermatology,
Services Institute of Medical Sciences/
Services Hospital, Lahore
Email: kehkshantahir@yahoo.com

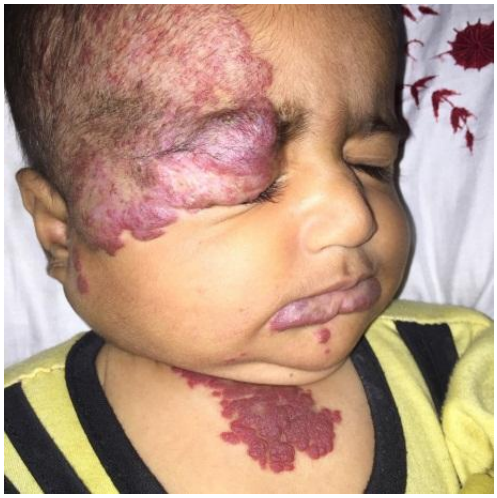

Figure 1 At presentation.

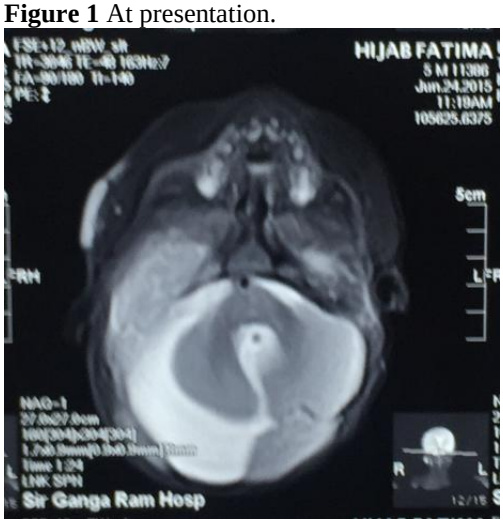

Figure 2 MRI.

Patient was treated with propranolol 1mg/kg once daily and regular follow-ups were maintained. There was marked improvement in the size of hemangioma (**Figure 3** and **4**). Differential diagnosis of Wyburn-Mason syndrome and Sturge-Weber syndrome was considered which were ruled out on history and examination.

The case was treated with propranolol 1mg/kg once daily and regular follow-ups were maintained. There was definite improvement noted in the size of hemangioma.

Discussion

Infantile hemangioma is the most common tumor in infancy and primarily involves skin and various other visceral organs. These are seen in 10% of children less than 1 year of age. Segmental facial hemangioma is not rare in our society. These are at higher risk of complications and can be associated with visceral hemangiomas or structural defects.

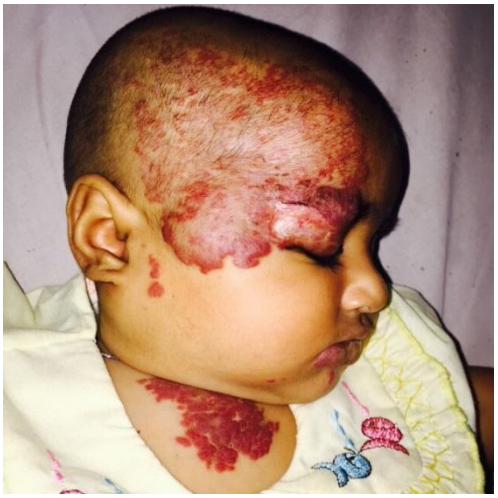

Figure 3 After 6 weeks.

Figure 4 After 10 weeks.

PHACE syndrome has to be differentiated from some other neurocutaneous syndromes like Wyburn-Mason syndrome and Sturge-Weber syndrome. In our case, segmental facial hemangioma and hypoplastic right cerebellum on MRI favoured the diagnosis. In Wyburn-Mason syndrome cutaneous findings of unilateral vascular abnormalities involving facial structure may resemble hemangioma but absence of intracranial and retinal arteriovenous malformation on MRI and ophthalmoscopy ruled out Wyburn-Mason syndrome.[5] Port-wine stain in case of Sturge-Weber syndrome may mimic facial

Table 1 Criteria of PHACE syndrome [4]

Organ System	*Major Criteria*	*Minor Criteria*
Cerebrovascular	Anomaly of major cerebral arteries • Dysplasia of the large cerebral arteries • Arterial stenosis or occlusion with or without moyamoya collaterals • Absence or moderate to severe hypoplasia of the large cerebral arteries • Aberrant origin or course of the large cerebral arteries • Persistent trigeminal artery • Saccular aneurysms of any cerebral arteries	Persistent embryonic artery other than trigeminal artery • Proatlantal intersegmental artery (type 1 and 2) • Primitive hypoglossal artery • Primitive otic artery
Structural brain	Posterior fossa anomaly • Dandy-walker malformation • Unilateral/bilateral cerebellar hypoplasia /dysplasia	Enhancing extra-axial lesion with features consistent with intracranial hemangioma • Midline anomaly • Neuronal migration disorder
Cardiovascular	Aortic arch anomaly • Coarctation of aorta dysplasia • Aneurysm	Ventricular septal defect • Right aortic arch (double aortic arch) • Aberrant origin of the subclavian artery with or without a vascular ring
Ocular	Posterior segment abnormality • Persistent fetal vasculature (persistent hyperplastic primary vitreous) • Retinal vascular anomalies • Morning glory disc anomaly optic nerve hypoplasia • Peripapillary staphyloma • Coloboma	Anterior segment abnormality • Sclerocornea • Cataract • Coloboma • Microphthalmia
Ventral or midline	Sternal defect • Sternal cleft • Supraumbilical raphe • Sternal defects	Hypopituitarism • Ectopic thyroid

hemangioma but absence of glaucoma on eye examination and MRI findings typical of PHACE syndrome in our patient excluded Sturge-Weber syndrome.[6]

Structural brain abnormalities are the most common extracutaneous manifestation in PHACE syndrome. The commonest posterior fossa abnormality is the Dandy-Walker syndrome.[7] The clinical manifestation of posterior fossa abnormalities include macrocephaly, enlarging head circumference, hemiparesis and developmental delay. Cardiac investigations revealed complex coarctation of aorta, the commonest cardiac lesion.[8] Structural heart defects are seen in around 15% of cases. 40% of cases are known to have vascular anomalies of cerebral and cervical regions. Children with vascular anomalies are at risk of aneurysms and cerebral infarction.[9]

The ocular, cerebrovascular and cardiovascular evaluations should be undertaken in patients presenting with segmental facial hemangioma. Additionally MRI with magnetic resonance angiography of the head and neck and echocardiography should be evaluated in infants at risk for PHACE syndrome. Early diagnosis and management can prevent potential complications including seizures aneurysms and ischemic strokes.

References

1. Frieden IJ, Reese V, Cphen D. PHACE syndrome: the association of posterior fossa brain malformations, hemangiomas, arterial anomalies, coarctation of the aorta and cardiac defects, and eye abnormalities. *Arch Dermatol* 1996;**132**:307-11.
2. Metry DW, Siegel DH, Cordisco MR, Pope E, Prendiville J, Drolet BA *et al*. A comparison of disease severity among affected male versus female patients with PHACE syndrome. *J Am Acad Dermatol* 2008;**58**:81-7.
3. Merty DW, Haggstrom AN, Drolet BA, Baselga E, Chamlin S, Grazon M *et al*. A prospective study of PHACE syndrome in infantile hemangiomas: demographic features, clinical findings and complications. *Am J Med Genet.* 2006;**140**:975-86.
4. Merty DW, Heyer G, Hess C, Grazon M, Haggstorm A, Frommelt P *et al*. Consensus statement on diagnostic criteria for PHACE syndrome. *Pediatrics.* 2009;**124**:1447-56.
5. Keswani T, Sharma V, Barnes J. Wyburn-Mason syndrome: a case report. *Int Ophthalmol.* 2008;**28**:437-38.
6. Enjolras O, Riche MC, Merland JJ. Facial port-wine stains and Sturge-Weber syndrome. *Pediatrics.* 1985;**76**:48-51.
7. Denzer F, Denzer C, Lenners BS, Bode H, Wabitsch M. A case of PHACE syndrome and acquired hypopituitarism. *Int J Pediatr Endocrinol.* 2012;**1**:20-1.
8. Sripornsawan P, Chotsampansharoen T, Kritsaneepaiboon S. Successful treatment of PHACE syndrome with oral propranolol. *J Hematol Transfus Med.* 2015;**25**:55-60.
9. Patil SJ, Moray AA, Kiran VS, Battu RR. PHACE/S syndrome: A syndrome infantile segmental hemangioma. *Indian J Paed.* 2010;**77**:911-3.