

## Acrocallosal Syndrome: A Rare Case Report

Tapan Kumar Biswas<sup>1</sup>, Sunil Kumar Agarwalla<sup>2</sup>, Shantanu Kumar Meher<sup>3</sup>, Subhranshu Sekhar Dhal<sup>4</sup>

<sup>1</sup>Junior Resident, Department of Pediatrics, M.K.C.G Medical College, Berhampur, District

– Ganjam, Pin 760004, State-Odisha, India.

<sup>2</sup>Associate Professor, Dept. of Paediatrics, M.K.C.G Medical College, 1<sup>st</sup> Lane Jayaprakash Nagar, Ganjam, Odisha, 760010

<sup>3,4</sup>Junior Resident, Dept. of Paediatrics, M.K.C.G Medical College, Berhampur, Ganjam, Odisha, 760004, India

### \*Corresponding author

Tapan Kumar Biswas

Email: [biswas.tapan433@gmail.com](mailto:biswas.tapan433@gmail.com)

---

**Abstract:** Acrocallosal syndrome (ACS) is a very rare genetic disorder characterised by craniofacial malformation in the form of partial or complete agenesis of corpus callosum and different forms of facial, digital abnormality along with moderate to severe mental retardation. It is generally inherited as autosomal recessive disorder and both sex can be affected equally. Diagnosis is mainly by clinical criteria with neuroimaging. Management by only supportive care. Here we present such a rare case.

**Keywords:** Acrocallosal syndrome, corpus callosum agenesis, craniofacial malformation.

---

### INTRODUCTION:

Acrocallosal syndrome (ACS) is a rare autosomal recessive genetic disorder with hypoplasia/agenesis of corpus callosum, moderate to severe mental retardation, characteristic craniofacial abnormalities, distinctive digital malformations and growth retardation [1]. The syndrome was first described by Albert Schinzel in 1979 [2]. The term “acrocallosal” refers to involvement of “acra” meaning fingers and toes; “callosal” meaning corpus callosum. Originally, this syndrome was suggested to be caused by a dominant mutation, but subsequent case reports demonstrated an autosomal recessive inheritance pattern due to the recurrences in families and parental consanguinity [3, 4, 5]. Although the mode of inheritance is autosomal recessive, cases often occur sporadically [6]. The gene for this syndrome was identified by Pfeiffer, et al as chromosome 12p [1]. There are no published incidence figures available, but ACS is classified as a rare disease by the National Organization of Rare Diseases as occurring with a frequency of less than 1 in 2,000 births [7]. There is no reported sex predilection [8]. Main manifestations include macrocephaly, large anterior fontanelle, prominent forehead, hypoplasia/agenesis of corpus callosum, pre/postaxial polydactyly, syndactyly, mental retardation, hypertelorism, strabismus, small nose, broad nasal bridge, high arch/cleft palate [9]. The other less frequent signs such as seizures, retinal pigment anomalies, optic atrophy, nystagmus, nipple anomalies, inguinal/ umbilical/ epigastric hernia and genital, visceral, cardiovascular and other cerebral anomalies[9]. In India, first ACS was reported in 2003 [6]. ACS may represent a heterogenous group of

disorders that, in some cases, may result from mutation in GL13 and represent a severe, allelic form of Greig’s Cephalopolysyndactyly syndrome [10]. In view of the clinical variability and the fact that facial dysmorphism is not always characteristic, the diagnosis of ACS may sometimes be difficult and subject to debate. Courtens et al (1997) laid down the minimal diagnostic criteria for this condition [11]. These are: 1. Total or partial absence of corpus callosum; 2. Minor craniofacial anomalies (prominent forehead, hypertelorism, short nose with anteverted nostrils, large anterior fontanel; 3. Moderate to severe psychomotor retardation (with hypotonia); and 4. Polydactyly. The presence of 3 out of 4 criteria together with other associated findings could lead one to suspect the diagnosis of ACS.

### CASE PRESENTATION:

A 3 months old child was hospitalised with chief complaints of multiple episodes of convulsion for last 7 days. There was no history of poor feeding, lethargy, excessive cry, cough & cold, loose stool. The child was full term normal delivery and no history of birth asphyxia or no significant post-natal events. There was no history of consanguinity or any seizure disorder in the family. On head to toe examination there was generalised hypotonia, prominent forehead with facial dysmorphism like downward slanting of eyes, broad nasal bridge, hypertelorism (fig.1, 2), macrocephaly (fig. 3), head circumference was 46 cms, wide open anterior fontanelle (fig. 4), length was 54 cms. On systemic examination there was no abnormality. On investigation blood parameter including thyroid function test was within normal limit. Karyotyping was normal. Funduscopy was also normal. EEG report

shows frequent spike and slow wave arising on right hemispheric lead suggestive of epileptic encephalopathy. CECT brain shows agenesis of corpus callosum (fig.5, 6).



**Fig.1 facial dysmorphism**



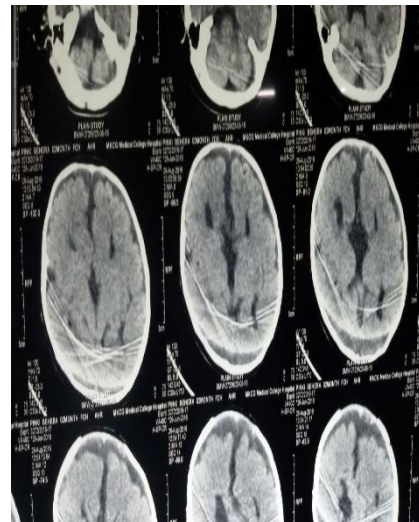
**Fig.2 facial dysmorphism**



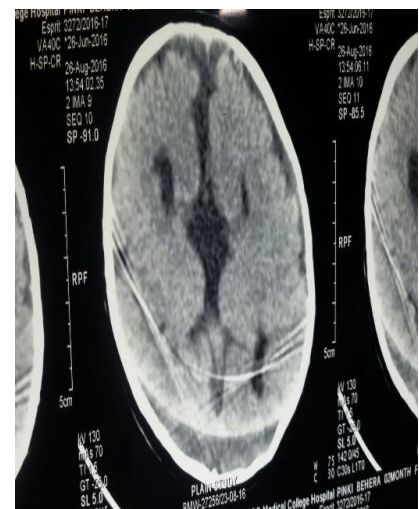
**Fig.3 macrocephaly**



**Fig.4 wide open fontanelle**



**Fig.5 corpus callosum agenesis**



**Fig.6 corpus callosum agenesis**

#### DISCUSSION:

The Acrocallosal syndrome is a true multiple congenital anomaly with mental retardation, whose pleiotropic effects mainly involve the central nervous system, face and skeleton. Though so many defects is there but facial dysmorphism and CNS malformation with seizure disorder are the most common presentation. This child was mainly presented with multiple episodes of unprovoked seizure with characteristic facial dysmorphism. Out of 4 criteria 3 were present with this child to diagnose ACS. Treatment includes physio therapy which may assist in the development of motor skills and muscle tone, long term antiepileptic therapy for seizure control. Vocational and psychological training may be required, depending on the level of mental impairment. As the mode of inheritance of ACS is autosomal recessive, the risk of recurrence is 25%. So Genetic counselling is of prime importance and antenatal diagnosis can be attempted by prenatal ultrasound. Polydactyly and central nervous system malformations can be detected by ultrasonography in the second trimester, but due to variability of presentation, prenatal diagnosis may not always be possible. Prognosis is variable and depends on the degree of hypotonia and early onset of epilepsy. Respiratory infections are the leading cause of early death. At present, there are no preventive measures for Acrocallosal syndrome.

#### CONCLUSION:

Though it is very rare disease but antenatal foetal anomaly scan by 4D ultra sounds can give a clue to this rare entity. Any child born by a product of consanguineous marriage presented with unprovoked seizure with absence of corpus callosum with craniofacial abnormalities should be examined meticulously to rule out this syndrome.

#### REFERENCES:

1. Gulati S, Menon S, Kabra M, Kalra V. Schinzel acrocallosal syndrome. *Indian journal of pediatrics*. 2003 Feb 1; 70(2):173-6.
2. Schinzel A. Postaxial polydactyly, hallux duplication, absence of the corpus callosum, macrencephaly and severe mental retardation: a new syndrome? *Helvetica paediatrica acta*. 1979 May; 34(2):141.
3. Schinzel A. Four patients including two sisters with the acrocallosal syndrome (agenesis of the corpus callosum in combination with preaxial hexadactyly). *Human genetics*. 1982 Dec 1; 62(4):382-.
4. Schinzel A, Kaufmann U. The acrocallosal syndrome in sisters. *Clinical genetics*. 1986 Nov 1; 30(5):399-405.
5. Docherty Z, Sellar MJ. Acrocallosal syndrome and 12p. *Ann Genet* 1993; 36:13
6. Lurie IW, Naumchik IV, Wulfsberg EA. The acrocallosal syndrome: expansion of the phenotypic spectrum. *Clinical dysmorphology*. 1994 Jan 1; 3(1):31-4.
7. National Organization for Rare Disorders. Danbury, Ct. "www.rarediseases.org". Accessed September 10, 2007.
8. Acrocallosal syndrome. Gorlin RJ, Cohen MM, Levin LS. *Syndromes of Head and Neck*. 3rd edn, New York: Oxford University Press; 1990: 800-1.
9. Guion-Almeida ML, Richieri-Costa A. Acrocallosal syndrome: report of a Brazilian girl. *American journal of medical genetics*. 1992 Aug 1; 43(6):938-41.
10. Elson E, Perveen R, Donnai D, Wall S, Black GC. De novo GLI3 mutation in acrocallosal syndrome: broadening the phenotypic spectrum of GLI3 defects and overlap with murine models. *Journal of medical genetics*. 2002 Nov 1; 39(11):804-6.
11. Courtens W, Vamos E, Christophe C, Schinzel A. Acrocallosal syndrome in Algerian boy born to consanguineous parents: review of the literature and further delineation of the syndrome. *American Journal of Medical Genetics Part A*. 1997 Mar 3; 69(1):17-22.