|| Print ISSN: 2589-7837 || Online ISSN: 2581-3935 ||

International Journal of Medical Science and Diagnosis Research (IJMSDR)

Available Online at www.ijmsdr.com

Volume 2, Issue 1; January-February: 2018; Page No. 36-38

CLEIDOCRANIAL DYSPLASIA: A CASE REPORT

Vasant Kandharkar[1], SourabhAgrawal[2], Anil Prasad[2], Pramila Adhikari[2], Anil S Chauhan[3]

[1]Associate Professor, Pediatrics, [2]Senior Resident, Pediatrics, [3]Assistant Professor, Dental

[1,2,3] Department of Pediatrics, Modern Institute of Medical Sciences & Sewakunj Hospital & Research Centre, Kanadia, Indore, M.P.

Conflicts of Interest: Nil

ABSTRACT

Cleidocranial Dysplasia is a rare autosomal dominant skeletal disease caused by mutation in the gene on 6p21 encoding transcription factor CBFAI, ie runt related transcription factor 2(RUNX2). The disease is characterized by a persistently open anterior fontanelle and skull sutures, hypoplastic or aplastic clavicles, dental abnormalities, short stature, a wide pubicsymphysis and a variety of other skeletal changes. A major finding of CCD is hypoplasia or aplasia of clavicular bones resulting in the ability of the patient to approximate the shoulders. Delayed closure of the anterior fontanelle and of metopic sutures causes frontal bossing. We report a case of CCD in a 8−year old girl who was referred to our clinic because of failure to thrive and emphasize the importance of clinical findings in CCD.

Keywords: Cleidocranial Dysplasia, unclosed fontanelle, aplasia of clavicle

Introduction

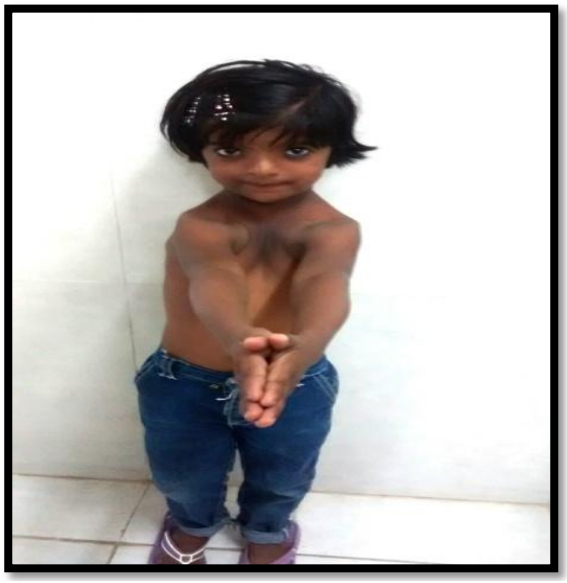
Cleidocranial dysplasia (CCD) is a rare dominantly inherited autosomal bone disease that is characterized by delayed closure of fontanelles, presence of open skull sutures, hypoplastic or aplastic clavicles, supernumerary teeth, delayed eruption of permanent dentition, wide pubic symphysis, short stature and a variety of other skeletal changes. Delayed closure of the anterior fontanelle and metopic sutures results in frontal bossing. The phenotypic spectrum ranges from mildly affected individuals with dental anomalities only to severely affected patients with syringomyelia (1, 2). CCD is also known as Marie−Sainton disease, mutational dysostosis, and cleidocranialdysostosis (3). Human osteoblast−specific, runt−related transcription factor 2 (RUNX2) gene located on chromosome 6p21 is identified as the gene responsible for CCD (4).

CASE REPORT:

A 8−year−old girl was referred to our clinic because of failure to thrive. She was born full term gestation to healthy parents, and her birth weight was 2600 g. Her development was as per age according to her parents.

Physical examination revealed a weight of 14 kg (below 3rd percentile), height of 102 cm (below 3rd percentile). The anterior fontanelle was wide open, wide nasal bridge, hypertelorism, dental deformities includinghigh−arched palate with class III skeletal malocclusion,retention of multiple deciduous teeth, impaction or delay in eruption of permanent tooth,brachiocephalic head were also noted. Both the clavicle were absent, the shoulders were ptotic and hypermobile - (Figure 1). Other system examinations were normal. The family history revealed no other member with bony abnormalities, delayed ossification, or short stature.

Corresponding author: Dr. Vasant Kandharkar



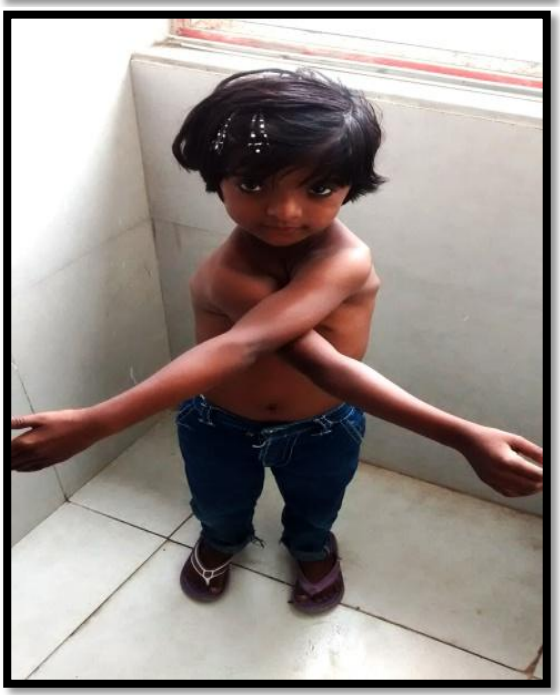
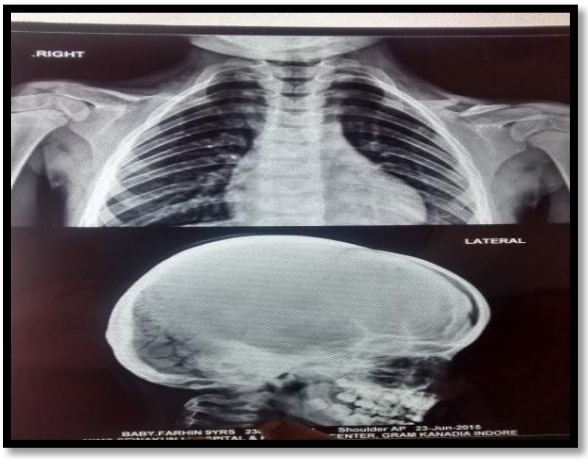


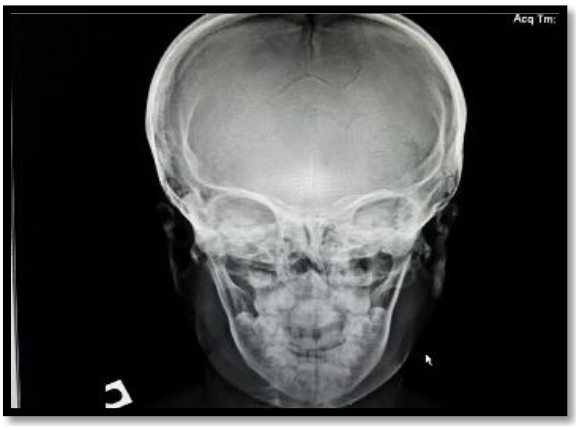
Figure 1:

Facial appreance and hypermobile shoulders

Laboratory investigations showed normal serum calcium, phosphorus, alkaline phosphatase, parathyroid hormone and vitamin D levels. Thyroid function tests were within normal ranges. Bone age was 5 years. Bone radiography demonstrated aplasia of the both clavicle, a narrow bell shape chest, wormian bones, a sclerotic skull base, (Figures 2a), a large anterior fontanelle, multiple supernumerary teeth and malocclusion (Figures 2b), a wide pubic symphysis, and coxavara(Figure 3)



Figures 2a



Figures 2b:

Open anterior fontanelle &supernumary teeth

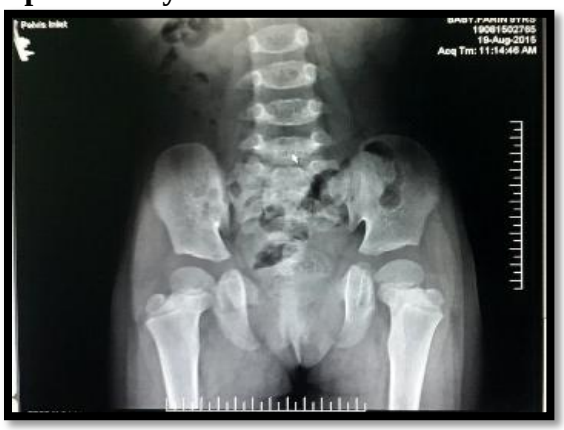


Figure 3:

Figure 3: Wide pubic symphysis and coxavara
Based on these clinical and radiological findings, the patient was diagnosed as a case of CCD.

Discussion:

The major features of CCD are aplastic or hypoplastic clavicles, dental abnormalities (multiple supernumerary teeth, multiple impacted

permanent teeth, retention of the deciduous teeth), and delayed closure of the sagittal fontanelles. Typically, our patient had all of these findings that are pathognomonic for a diagnosis of CCD (1). Other findings of CCD are short stature, a bell−shaped thorax, hypoplasia of the pelvis, enlargement of the frontal and occipital bones, and phalangeal abnormalities. Shortened or absent nasal bones, paranasal sinus abnormalities, thickening of some segments of the calvaria, small maxillae, and delayed union of the mandibular symphysis are less common findings of CCD. There is a notably phenotypic variation of CCD even within one and the same family. In approximately 40% of CCD patients, a genetic transition cannot be identified, and the condition develops spontaneously (1, 5, 6, 7).

Clavicles are underdeveloped to varying degrees in these patients and are completely absent in approximately 10 percent. This allows excessive mobility of the shoulder girdle, as was also observed in our patient.

Dental abnormality is one of the main features of CCD. Our patient had multiple supernumerary teeth, which can impede the normal eruption of permanent teeth. Dental management includes combination of orthodontics and maxillofacial surgery. Protocol involves timely extraction of deciduous teeth, staged surgical removal of supernumery teeth, exposure of selected unerupted permanent teeth and orthodontic forced eruption.(6, 7, 8).

It is known that CCD is caused by heterozygous mutations in RUNX2 gene, which encodes a transcription factor required for osteoblast differentiation and is located on chromosome 6p21 (1, 9). Many mutations in the RUNX2 gene have been identified in patients with CCD.

Conclusion

In conclusion, CCD should be kept in mind by pediatricians as a cause of failure to thrive. Although the clinical findings of CCD are present at birth, diagnosis of the disease is often delayed. Thus, we want once again to draw attention to the importance of physical examination in the diagnosis of this disease.

Acknowledgement:

We sincerely thank to the Dean, M.I.M.S, Kanadia Indore for granting permission to publish the case report

References:

1. Mundlos S. Cleidocranial dysplasia: clinical and molecular genetics. J Med Genet. 1999;36:177–182.
2. Vari R, Puca A, Meglio M. Cleidocranial dysplasia and syringomyelia. A case report. J Neurosurg Sci. 1996;40:125–128.
3. Kalliala E, Taskinen PJ. Cleidocranialdy-sostosis: report of six typical cases and one atypical case. Oral Surg Oral Med Oral Pathol. 1962;14:808–822.
4. Yoshida T, Kanegane H, Osato M, Yanagida M, Miyawaki T, Ito Y, Shigesada K. Functional analysis of RUNX2 mutations in Japanise patients with cleidocranial dysplasia demonstrates novel genotype−phenotype correlations. Am J Hum Genet. 2002;71:724–738.
5. Tanaka JLO, Ono E, Filho EM, Castilho JCM, Moraes LC, Moraes MEL. Cleidocranial dysplasia: importance of radographic images in diagnosis of the condition. J Oral Sci. 2006;48:161–166.
6. McNamara CM, O'Riordan BC, Blake M, Sandy JR. Cleidocranial dysplasia: radiological appearences on dental panoramic radiography. Dentomaxillofac Radiol. 1999;28:89–97.
7. Garg RK, Agraval P. Clinical spectrum of cleidocranial dysplasia: a case report. Cases Journal. 2008;1:377–377.
8. Jensen BL, Kreiborg S. Dental treatment strategies in cleidocranial dysplasia. Br Dent J. 1992;172:243–247.
9. Yoshida T, Kanegane H, Osato M, Yanagida M, Miyawaki T, Ito Y, Shigesada K. Functional analysis of RUNX2 mutations in Japanise patients with cleidocranial dysplasia demonstrates novel genotype−phenotype correlations. Am J Hum Genet. 2002;71: 724–738.