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RESEARCH ARTICLE

CASE REPORT OF: CLEIDOCRANIAL DYSPLASIA PRESENT WITH HIP COXA VARA.

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Abstract

Antibiotic sensitivity revealed that all isolates were fully susceptible to enrofloxacin, ciprofloxacin, while all isolates were fully resistant to penicillin. *E. coli* serogrouped isolates were subjected to PCR for detection of *Stx1* and *Stx2* genes. 3 out of 7 serogrouped isolates (42.85%) were carried *Stx2* gene (O55 and O27 from contact human and O86 from mastitic milk) while *Stx1* gene was not detected. phylogenetic analysis for the sequence data of the *Sxt2* gene of *E. coli* serogroupes revealed that *Sxt2* gene isolated from mastitic milk of cattle is closely identical (100% identity) to *Sxt2* gene isolated from contact human. In Conclusion, isolation of STEC from cattle might have potential pathogenicity for human. So that contact human should use sound hygienic measures during milking and management of these animals to avoid zoonotic infection.

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Introduction:-

Cleidocranial dysplasia (CCD, OMIM 119600) is a rare skeletal disorder of autosomal dominant inheritance with an estimated incidence of 1/1,000,000. The main clinical features of CCD include persistent, open cranial sutures with bulging calvaria; hypoplasia or aplasia of the clavicles; dental anomalies; a short middle phalanx in the fifth finger; and associated vertebral anomalies.[1]. This condition is primarily caused by mutations in the gene that encodes runt-related transcription factor 2 (RUNX2, MIM #600211), located on chromosome 6p21. The RUNX2 protein functions mainly in osteoblast differentiation and regulation, which contributes to the skeletal and dental abnormalities observed in CCD.[2]. In addition to its expression in osteoblasts, the RUNX2 protein is also present in non-osteoblast cells, including skeletal and smooth muscle cells, T cells, sperm cells, and neurons.[3].

Congenital coxavara is a developmental abnormality characterized by a decreased femoral neck-shaft angle, shortening of the femoral neck, and shortening of the affected lower limb. The exact cause of congenital coxavara is unknown but is believed to result from a primary defect in enchondral ossification of the medial part of the femoral neck.[4]. Histologic studies have shown that there are abnormalities in both cartilage production and metaphyseal bone formation at the proximal femur. Weight bearing on the affected hip causes increased shearing forces through the physis and leads to the progressive varus deformity.[5,6]. There are many other proposed etiologies, including metabolic, mechanical, and developmental abnormalities.

Congenital coxavara is a relatively rare deformity, occurring in approximately 1 in 25,000 live births (approximately 20 times less common than developmental hip dysplasia). Patients with congenital coxavara often have gait abnormalities or an LLD. The condition is usually diagnosed between the ages of 2 and 8 years. There is a slight increased incidence of congenital coxavara in African Americans and a positive family history. There is bilateral

involvement in approximately 30-50% of patients. Here, we describe Cleidocranial dysplasia with left coxavara.[7,8] We reports a case of a A 17-year-old boy is a known case of cleidocranial dysplasia was complaining of limbing since childhood, progressive, and associated with left hip pain if he sits crossed leg for long time. the diagnosis of CCD was established by clinical, radiological and molecular elements,in this clinical case. He underwent a left hip (intertrochanteric) valgus osteotomy.

Case presentation:-

A 15-year-old boy presented with left hip pain. The patient has skeletal anomalies. Past history was full-term, spontaneous vaginal delivery, pregnancy unremarkable, birth weight about 3 kg and had normal motor development milestone. By the age of one year parents noticed delayed closure of anterior fontanelle and subsequently were found to have leg length discrepancy (LLD) and absent clavicles. On examination, he was having dysmorphic features (macrocephaly, wide metopic suture, frontal bossing head, hypertelorism, depressed nasal bridge, pulled upper lip and bilateral absent clavicles) with short limb. X-ray showed severe coxavara of the left hip (figure 1). Then, the patient was referred for gene study and he was found to be positive RUNX2 (the gene responsible for cleidocranial dysplasia).



Figure 1:- a radiograph of the patient's pelvic showing severe coxavara of the left hip with a femoral neck-shaft angle of 90°, and a Hilgenreiner epiphyseal angle greater than 15°.

After the patient finished all his investigations, he came back to the clinic. At that time, he started to complain of left hip pain if he sits crossed leg for long time, with leg length discrepancy 2 cm, limping and difficulty in sitting. On examination, he was found to have limited abduction. The x-ray showed left hip coxavara 90°. Then, patient was booked for valgus osteotomy at proximal femur. He underwent subtrochanteric valgus osteotomy (using pediatric hip plate - figure 2). After the surgery, He was recovering and doing well. Then, he was referred to the physical therapy department for NWB mobilization to the left lower limb.



Figure 2:- a radiograph of the patient's pelvic showing the left hip after the subtrochanteric valgus osteotomy.

Before the surgery the patient was complaining of hip pain, limping, difficulty in sitting and abnormal gait. During the surgery, the femoral neck-shaft angle (FNSA) was corrected, the 2cm LLD was corrected, so the Left lower limb is longer than before. After the surgery, the pain was relieved, the gait was corrected, the Limping, and difficulty in sitting were improved. No recurrence of the deformity was observed during the follow-up appointment at the out-patients department. All these Are signs of a successful surgery.

Discussion:-

Cleidocranial dysplasia (CCD) is a rare inherited disorder. The main clinical features of CCD include persistent, open cranial sutures with bulging calvaria; hypoplasia or aplasia of the clavicles; dental anomalies; a short middle phalanx in the fifth finger; and associated vertebral anomalies. Congenital coxavara is a relatively rare developmental abnormality characterized by a decreased femoral neck-shaft angle, shortening of the femoral neck, and shortening of the affected lower limb.[9] . This condition is primarily caused by mutations in the gene that encodes runt-related transcription factor 2 (RUNX2, MIM #600211), located on chromosome 6p21. The RUNX2 protein functions mainly in osteoblast differentiation and regulation, which contributes to the skeletal and dental abnormalities observed in CCD.[10]. Histologic studies have shown that there are abnormalities in both cartilage production and metaphyseal bone formation at the proximal femur. Weight bearing on the affected hip causes increased shearing forces through the physis and leads to the progressive varus deformity.[5,6]. There are many other proposed etiologies, including metabolic, mechanical, and developmental abnormalities. There are many diagnostic criteria for this condition. Manifested by certain abnormalities such as: 94% have supernumerary teeth and eruption failure of permanent teeth; Clavicular hypoplasia are usually encountered In CCD patients which manifested as narrow shoulders on examination[11]. CCD patients are more likely to have other orthopedic deformities, such as clubfoot, genu valgus, severe scoliosis and coxavara as presented in this case.

The few published literatures regarding developmental coxavara discussed the treatment of femoral varus deformity without addressing the acetabular side of the joint. Regarding the management of coxavara, not all cases require surgical correction; there are reported cases of spontaneous improvement of mild angulatory deformities.[12]. Amstutz and Wilson highly recommend surgery for neck-shaft angles less than 90°.[13].

In a more recent literature, Weinstein et al described an angle named the Hilgenreiner-epiphyseal (HE) angle, which is located between Hilgenreiner's line and the proximal femoral physis. Although they failed to differentiate cases of congenital coxavara with short femur from those of the developmental condition, their surgical recommendation were similar to those of Amstutz and Wilson.[14]

Management of CCD patients requires multidisciplinary approach, including the patient and the patient's family,[15] with the ministry of treatment aimed toward improving quality of life of CCD patients. Presently, orthodontic and orthopaedic management is being undertaken for this patient.

Conclusion:-

cleidocranial dysplasia is a genetic condition characterized by multiple skeletal and dental anomalies. Although not as common as the dental aspects of the condition which require intervention, orthopaedic surgeons should have a working knowledge of the cleidocranial dysplasia and follow patients carefully as they grow for development of brachial plexopathy, abnormal gait or hip range of motion, signs of "chef's hat" femoral head deformity, coxavara, or osteoporosis. Patients with coxavara should be considered for surgery, whereas patients with clavicular hypoplasia and absence of pubic symphysis ossification can usually be observed and managed conservatively.

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Abbreviations

CCD: Cleidocranial dysplasia .
 RUNX2: Runt-related transcription factor 2
 FNSA: the femoral neck-shaft angle.
 LLD: leg length discrepancy

Ethical Responsibilities

The authors state that they have

followed the protocols of their Center and Local regulations on the publication of patient data. The authors have obtained the informed consent of the patients and/or subjects referred to in the article

Financial Disclosure

Null

Conflicts of Interest

The authors declare that they have no conflict of interest with respect to this case report.

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Competing interests

The authors declare that they have no competing interests.

Authors' contributions

BA: following up the patient and was a major contributor in writing the manuscript.

AAT: conducted the examination and did the biopsy and wrote the case history section.

AAS: the primary clinician who encounter the patient and write the description of the imaging in the manuscript.