ORIGINAL RESEARCH PAPER

Pathology

KEY WORDS: Dyssegmental dysplasia, cystic hygroma, fetal malformation

Dyssegmental Dysplasia with cystic hygroma: an extremely rare presentation. A case report.

Dr Manupriya Sharma MD, DNB, Assistant Professor, Deptt. of Pathology, DR RPGMC, KANGRA(HP)* - Corresponding author

Dr Bal Chander Professor, Deptt. of Pathology, DR RPGMC, KANGRA (HP)

ABSTRACT

Introduction:
Dyssegmental dysplasia is an extremely rare fetal anomaly. It is a lethal form of skeletal dysplasia characterized by a disordered ossification of vertebral bodies, facial dysmorphism and camtomicromelic dwarfism. Prenatal diagnosis is a rarity.
Case report:
A 26-year-old primae gravid non-consainguineous woman presented at 18 weeks of gestation with severely malformed fetus. Ultrasonography showed cystic hygroma with micromelia. Medical termination of pregnancy was done after informed consent. On fetal radiography and autopsy, the final diagnosis of dyssegmental dyplasia was confirmed.
Summary & conclusion:
Dyssegmental dysplasia is a rare fetal anomaly and is uniformly associated with poor neonatal prognosis. Fetal radiography and autopsy are mandatory to confirm the diagnosis, so as to advise parents for genetic counseling regarding subsequent pregnancies.

Introduction:
Dyssegmental dysplasia (DD) is a rare autosomal recessive micromelic dwarfism with anisospondyly and pathogonomic features in spine.[1] Silverman reported the first case in 1969 as "unclassified dysostotic dwarfism."[2] The term "dysegmental dysplasia" was coined by Handmaker et al.[3] The term "dyssegmental dysplasia" better describes this condition with the marked disorganization of vertebral bodies.

There are two distinct forms of this condition: Rolland-Desbuquois DD (mild form) and Silverman Handmaker DD (severe lethal form).

Aleck KA et al described this condition in detail with requirement of radiography for confirmation of vertebral changes in this condition.[4] To the best of our knowledge till date only thirty such cases have been reported. We hereby report a case of dyssegmental dysplasia Rolland-Desbuquois type.

Case report:
A 26-year-old primae gravid non-consainguineous woman, presented at 18 weeks of pregnancy with abnormal fetal scan. Ultrasonography showed cystic hygroma with micromelia (Figure 1 [a]). Both the parents were offered detailed fetal genetic testing. However, due to financial constraints they could not afford fetal karyotype. Nonetheless, due to severely malformed fetus they consented for medical termination of pregnancy (MTP). After MTP, they were advised regarding need of fetal autopsy to which they agreed.

Fetal Examination:
External examination revealed a female fetus aged 14-16 weeks (hypotrophic) with facial dysmorphy (i.e. depressed nasal bridge, low set ears, short neck), cystic hygroma, narrow chest and short curved limbs (both upper limbs and lower limbs) {Figure 1}. There were flexion contractures at both elbows and knees. With a provisional diagnosis of micromelia, fetal radiography was done. Radiographs showed short and thick tubular bones (femur & humerus). Trunk was short. On lateral view of spine vertebral bodies were of variable shapes and sizes (Figure 1[b]). Subsequently, fetal autopsy was performed; radiographic findings were confirmed, there was no visceral abnormality and vertebral bodies showed gross disorganization with variable shapes and sizes.

Discussion:
DD is a rare autosomal recessive, lethal anisospondylic camptomicromelic dwarfism.[5] It is of two types:

1. ***Silverman-Handmaker DD*:**
This is a lethal and severe form. Most afflicted fetuses are either stillborn or die within first few days of life. It is characterized by markedly short stature, short bowed limbs, limited joint mobility, facial dysmorphism, cleft palate and equinovarus deformity of the feet. Radiographic examination of the spine show a peculiar type of mal-segmentation characterized by delayed ossification of the vertebral bodies. Each vertebral body may contain two or more ossification centers of different sizes and shape. This type of DD is caused by mutation in the gene encoding perlecan.

2. ***Rolland-Desbuquois DD*:**
It is a milder form. The newborns may survive up to three years. Both clinical and radiological features are less severe than the Silverman- Handmaker type.

The index case showed marked changes in spine along with micromelia. Cleft palate or equinovarus deformity of the feet were not seen in the index case. Ante-natal diagnosis has been suspected in either of two conditions; family history of dwarfism or ultrasonography showing femur length less than 5th percentile for the gestational age.[7] In this index case femur length was less than 5th percentile for gestational age. Arachnoid cysts or venous angioma have also been described in association with this anomaly.[8] However, index case had cystic hygroma.

Dyssegmental dysplasia, Silverman-Handmaker is caused by mutations in the perlecan gene (HSPG2).[7] Perlecan is a large heparan sulfate proteoglycan present in all basement membranes and in some other tissues such as cartilage, and is implicated in cell growth and differentiation.[9]

In our study, it is unfortunate that it was not possible to undertake fetal karyotype, molecular or perlecan investigations in the fetus but the diagnosis was confirmed by radiology and fetal autopsy. The differential diagnosis includes fibrochondrogenesis, chondrodysplasia punctata and Weissenbacher-Zweymuller syndrome. Fibrochondrogenesis is characterized by limb and vertebral deformities including shortened dumbbell-shaped metaphyses and pear-shaped vertebral bodies. The short limbs noted in fibrochondrogenesis are in a proximal or rhizomelic pattern. This is in contrast to dyssegmental dysplasia which is characterized by micromelia or disproportionate shortening of the entire extremity. Chondrodysplasia punctata is typified by

vertebral bodies with coronal clefts, metaphyseal splaying and stippled epiphyses.

In conclusion, in the absence of molecular and biochemical tests, prenatal ultrasonography is the only tool available for prenatal diagnosis. Fetal autopsy and radiography confirms the diagnosis so as to allow a suitable genetic counseling.

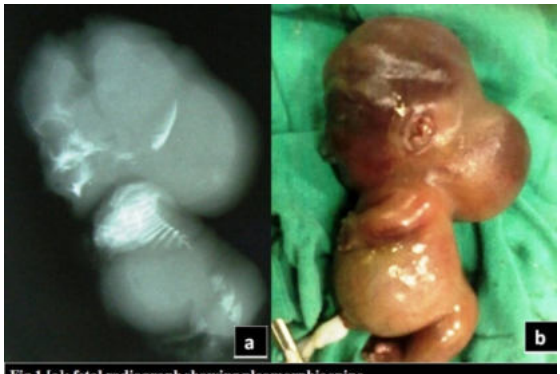

Fig 1 [a]: fetal radiograph showing pleomorphic spine [b] Lateral view of fetus with gross facial dysmorphism (depressed nasal bridge, low set ears, short neck) micromelic dwarfism and cystic hygroma

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