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Case Report

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A CASE REPORT- BILATERAL BRACHY METATARSIA OF FOURTH TOE

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ABSTRACT

Metatarsal bones are five small bones of foot present between the tarsal bones and phalanges of the foot. Brachy means small. Hypoplasia of metatarasal bone means the bone is small in size with the normal growth. Usual presentation is small size of toe in young age with associated deformity and pain. Incidence of brachymetatarsia is one in 2000 population. More common in females. It's incidence is high in Down's syndrome and with other genetic disorders. In our case there was small size of 4th metatarsal bone in both foot in young 8 yrs female. No other associated abnormality was seen in this case. Sibling and other family members were normal.

KEYWORD: Brachymetatarsia, Metatarsal hypoplasia, shorting of 4th toe, Short fourth toe, congenital brachymetatarsia.

INTRODUCTION

Metatarsal are five miniature bones of foot, present in between the tarsal and the phalanges. Brachymetatarsia is a congenital short metatarsus, an uncommon condition that develops due to early closure of the growth plate. Females are affected more, Incidence wise F: M =25:1. Classically affect 4th with reported bilateral incidence of 70%. (range 50-90 %0). But less frequently may affect more than one metatarsal bone. Then called Brachymetapody. Brachymetatarsia may be associated with several genetic disorders.

The metatarsals are gradually longer in length from 5th to 1st, from lateral to medial .Body weight is transmitted from fifth toe to first toe, lateral to medially that is the longest 5th metatarsal gets the maximum weigth. This physiological process of weight transfer is disturbed in cases of hypoplasia of metatarsal, brachymetatarsia. This results in improper transfer of weight and can result in local pain. These cases usually present with difficulty in wearing footwear because of the hypoplastic toe tends to tenor upwards. Therefore metatarsal hypoplasia is not a merely cosmetic issue but more that.

Most of the cases of brachymetatarsia remain asymptomatic during young age except the apparent deformity of foot. As the age grows these cases may develop pain more during walking and with prominent deformity of foot.

When one of the metatarsal bones stops its growth as compared to the other growing metatarsals, than result in hypoplasia of that particular metatarsal bone. Its usual presentation is in young age. Hypoplasia of metatarsal can be due to infection or trauma also. But hereditary or genetic disorders are more common causes of hypoplastic metatarsal.

Inappropriate body weight transmission due to hypoplasia of metatarsal bone leads to significant discomfort and pain. This may hamper the normal life activities like walking, running along with deformity of foot. The cosmetic factor can cause difficulties in getting proper and comfortable footwear and subsequent mental distress.

CASE REPORT

A 8 year old female child referred to Radiology department from orthopedic outpatient department with growing deformity and pain during walking .in both foot. ANC period of the child's mother was unremarkable. Child's development was normal, except parents noticed slowly growing deformity of both foot. There was no sign cant family history. Her sibling, Elder brother of 12 years age was normal. There was no past history of trauma or infection in the child. Her systemic examination was unremarkable. Child was advised for radiograph of both foot in AP and Oblique view Local physical examination revealed dorsally placed 4th toe on

both foot. Skin was normal on dorsal aspect of 4th the toe in both foot.

Radiographs of both foot revealed hypoplastic 4th metatarsal in both foot. No other abnormality was seen in radiograph of both foot.

Photograph of both foot showing deformity of 4 th toe

Radiograph both foot - Bilateral hypoplastic 4th metatarsal bone.

DISCUSSION

Hypoplatic metatarsal bone, Brachymetatasia is not un common condition of foot seen in day to day especially in young orthopedic patients. Brachymetatarasia is an abnormal shortening of metatarsals.[1] There is preponderance to female, in ratio of approximately 25:1.[1-2] and the incidence is 0.02%- 0.05%.[2] Most commonly the first and fourth metatarsals are affected in brachymetatarsia.[1] It's a result of arrested growth or premature closure of the epiphyseal plate.[2] Usually brachymetatarsia is congenital or idiopathic in etiology. Some time may be associated with systemic diseases eg. Pseudohypoparathyroidism, Turner's syndome, Down's syndrome, Apert syndrome, enchondromatosis, Multiple epiphysael dysplasia, Sickle cell anemia. and Poliomyelitis.[2] Brachymetatarsia may affect one or more metatarsals in one or both sides.[3-10,12-15] with higher incidence of involvement, more than 50% in both side.[10-15] Association of hypoplasia of phalanx, hypoplasia of soft tissue, brachydydactyly, brachymetacarpia or osteochondromatosis. may present.[2]

The common presentation is deformed foot or cosmetic look, subsequatenly pain and associated with symptoms of other associated conditions.[1]

The most common cause of congenital shortening of first metatarsal is seen in Morton's syndrome.[5] Incidence of brachymetatarsia of first metatarsal was 1 in 10,000 reported in Japanese.[6-7] While other references showed higher incidence of hypoplastic fourth toe.[7-11] Short third or fifth metacarpals along with fourth brachymetatarsia were reported in 14% of cases while bilateral shortening was found in 72% of congenital cases by Urano Y etal.[10] These also reported the incidence of 0.022% (1 in 4586) in 4-15 years old Japanese children with high female predominance of 25:1.[8] Mah et al reported the incidence of hypoplastic metatarsal of 1:1820 in US.[11] Hereditary likage[8] and recessive traits that have leap generation was also observed.[12]

The secondary ossification centre exist in the base of first metatarsal while it is in the head of other metatarsals.[13] As per Kite brachymetatarsia is the result of premature fusion of epiphysis plate at the distal end of metatarsal, most commonly in 4th metatarsal, may be in uni or bilateral.[14] This could be result from hereditary, traumatic or environmental causes.[1]

Davidoson[15] reported various causes of brachymetatarsia (A). Congenital: 18p syndrome, Langer-Giedion syndrome, Aarskog syndrome, Apert syndrome, Brachiodactyly type F, Carpenter's syndrome, Killian/Teschler-Nicolas syndrome, De Lang syndrome, Rett syndrome, Ectrodactyly, Grebe syndrome, Hypochondroplasia, Hajdu-Cheney syndrome, Hand-foot-genital syndrome, Jeune's thoracic dystrophy, Leri-Weill dyschondrosteosis, Mejewski type short rib polydactyly, Mohr syndrome, Multiple synostosis syndrome, Orofacial-digital syndrome, Pfeiffer syndrome. Poland's anomaly, Robinow's syndrome, Rothmund-Thomson syndrome, Ruvalcaba's syndrome, Weill-Marchesani syndrome, Werner's syndrome, X-syndrome.(B). Endocrinopathies: Multiple epiphyseal dysplasia, Pseudo-hypoparathyroidism, Diastrophic dysplasia, Pseudo-pseudohypoparathyroidism. (C). Aquired: Iatrogenic injury, Trauma, Epiphysael fracture. Thermal burn, Radiation, Juveline Rheumatoid arthritis, Sickle cell crisis. Polio.

Brachymetatarsia cases, may have an accessory navicular bone in 10% cases (range 4%-21%).[2] Such accessory navicular bone was not seen in our case.

In the present case brachymetatarsia was diagnosed on radiograph of both feet when the case was referred as parents of the female child noticed the growing deformity on both foot. There was no family history of such abnormality in other family members. In personal history of the child also no other significant known factors for such deformity was noticed. In cases of brachymetatasia psychological counseling is important and when on walking becomes painful than it’s an indication for the corrective surgery.

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