Femoral-facial syndrome: First reported case in Sri Lanka

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Introduction

Femoral–facial syndrome (FFS) is a rare, sporadic, multiple congenital anomaly syndrome characterized by bilateral femoral hypoplasia and unusual facial characteristics[1,2]. It was first described as a distinctive entity by Daentl DL, *et al* in 1975[3]. FFS has a prevalence of less than one in a million[4]. It is strongly associated with maternal diabetes mellitus[5]. We present the first reported case of FFS in Sri Lanka

Case report

A baby boy was delivered at 35 weeks of gestation to a 33-year-old mother in her second pregnancy who underwent emergency caesarean section due to pathological fetal cardio-tocographic monitoring and a suspected placental abruption. This was an unplanned, unexpected pregnancy in non-consanguineous parents. Mother, who has a strong family history of diabetes mellitus, was diagnosed as having type 2 diabetes mellitus at 25 years of age and is being treated with oral metformin. She had a fasting blood sugar of 180mg/dl and a glycated haemoglobin level (HbA1C) of 11.5% (normal range 4% – 5.6%) at the booking visit at 8 weeks of gestation. Subsequently, she attained good glycaemic control throughout her pregnancy with nutritional and medical management where fasting blood sugar levels were less than 90mg/dl and post prandial blood sugar levels were less than 120mg/dl. An antenatal scan performed during 22 weeks of gestation revealed a femoral length of 33.8mm (12th centile) and an estimated weight of 424g (17thcentile) while an antenatal scan done at 28 weeks of gestation showed a femoral length of 45mm (1st centile) and an estimated weight of 867g (below 1st centile) and showed evidence of intrauterine growth restriction (IUGR). Oligohydramnios and breech presentation were also noted in both antenatal scans. There was no history to suggest exposure to teratogens and there was no family history of similar disease. The baby was in extended breech presentation with a birth weight of 1.63kg (on -2SD), a length of 36cm (well below -3SD) and an occipito-frontal circumference (OFC) of 29.5cm (on -3SD). On examination, increased distance between the inner canthi of eyes (tele-canthus), upward slanting eyes, a short nose with a broad tip and poorly formed alae nasi, a left sided cleft lip, a cleft palate and micrognathia were found (Figure 1).

Figure 1: *showing telecanthus, upward slanting eyes, short nose with broad tip, cleft lip and micrognathia*
**Permission given by parents to publish photograph*

Lower limbs showed bilateral symmetrical femoral shortening and bilateral structural talipes equinovarus deformity as demonstrated in Figure 2.

Figure 2: *demonstrating bilateral short thighs and talipes equinovarus deformity*

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There was no polydactyly. No abnormality was detected in the upper limbs, spine or skin. Bilateral testes were palpable in the inguinal canal and both scrotal sacs were well formed. The baby was active and alert. The rest of the neonatal examination was unremarkable.

The radiological evaluation of the skeletal system showed bilateral symmetrical hypoplasia of the proximal femurs with poor formation of the femoral heads and acetabulae bilaterally (Figure 3).

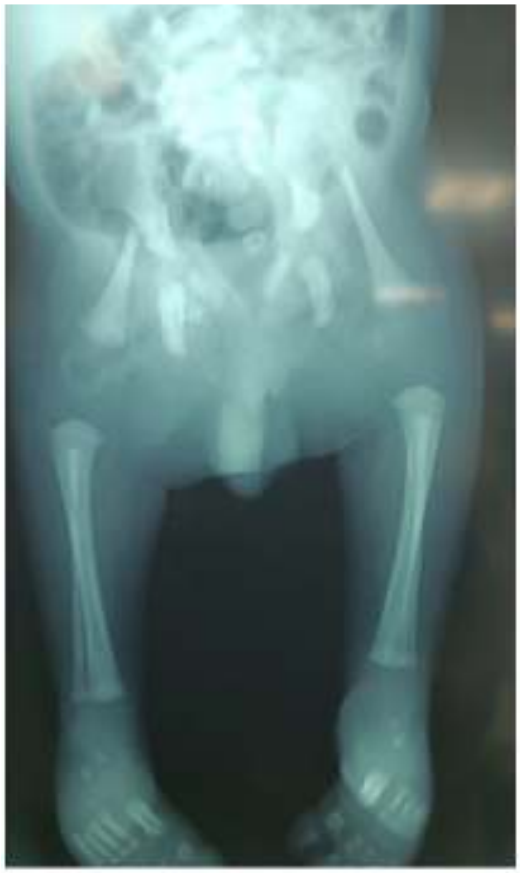

Figure 3: *demonstrating bilateral symmetrical hypoplasia of proximal femurs with poor formation of femoral heads and acetabula on both sides*

It was not possible to comment on the ultrasound scan of the hips regarding dysplasia of the hips due to the poor formation of the femoral heads and acetabula. Ultrasound scan of the abdomen revealed a solitary pelvic kidney. The serum creatinine was 90.8µmol/L (normal range 69-141µmol/L) and blood urea was 4.29 mg/dL (normal range 0.7- 4.6mg/dL). The ultrasound scan of the brain was normal. Echocardiography revealed a moderate size patent ductus arteriosus (PDA), asymmetrical septal hypertrophy and a small ostium secundum atrial septal defect.

Baby was discharged at 1 week of age on nasogastric feeds with expressed breast milk due to feeding difficulties with cleft lip and cleft palate after consultation with the orthodontic team. He had surpassed his birth weight and was thriving well by 2 weeks of age. He was commenced on a feeding obturator at 3 weeks of age. He is awaiting repair of cleft lip and palate by the orthodontic team when his weight reaches approximately 5kg. The repeat echocardiogram done at 4 weeks of age revealed closure of the PDA. Baby was commenced on nocturnal urinary prophylaxis and referred to the paediatric nephrologist who has planned to do a DMSA scan at 3 months of age.

Discussion

FFS is also known as bilateral femoral dysgenesis, bilateral femoral dysgenesis with Robin anomaly, isolated femoral hypoplasia and femoral hypoplasia–unusual facies syndrome[2]. Almost all reported cases have been sporadic with the exception of 3 cases of autosomal dominant inheritance reported in an infant and maternal great-aunt by Kelly in 1974, father and daughter by Lampert in 1980 and infant and paternal great uncle by Robinow in 1995[6,7,8]. Parental consanguinity was observed in two Brazilian patients[9]. Our patient appears to have a sporadic disease with non-consanguineous parents and no family history of a similar disease. As in our patient, maternal diabetes has been reported in approximately 50% of patients with FFS[9,10].

Clinical signs characterized as relatively frequent (20-30%) included upward slanting palpebral fissures, thin lips with a long philtrum, low set poorly formed ears, fusion of sacrum and coccyx, short stature, hip dysplasia, coxa vara, abnormal fibula, talipes equinovarus and pre-axial foot polydactyly[2]. Our patient had upward slanting palpebral fissures, long philtrum, short stature, bilateral hip dysplasia and talipes equinovarus with normal ear formation, normal sacrum and coccyx and normal fibula. Clinical signs characterized as less frequent (5-29%) included strabismus, Sprengel anomaly, rib fusion, radioulnar synostosis, scoliosis, renal hypoplasia, renal anomalies, enlarged penis and ventriculomegaly[2]. The most frequent (53%) visceral malformations were genitourinary[5]. Our patient had a single pelvic kidney. Inguinal hernia and cryptorchidism have also been reported[11]. Our patient had cryptorchidism where both testes were palpable in the inguinal canal. Our patient had a PDA similar to that reported by Lichade *et al*[12].

FFS is a differential diagnosis in skeletal dysplasia such as campomelic dysplasia, Antley-Bixler syndrome and kyphomelic dysplasia, characterized by shortening and abnormal bowing of the long bones[5]. FFS usually involves only the femoral bones and other long bones are rarely involved[5].

Caudal regression syndrome (CRS), which is associated with diabetes and is characterized by sacrococcygeal abnormalities and urogenital abnormalities, is also a differential diagnosis to FFS [5,13,14]. Sacral dysgenesis is less commonly seen in FFS and facial anomalies are less common in CRS[5]. Experiments done by Landauer suggest that the involvement of the proximal femora and maxilla resulting in FFS, rather than the sacrum and the vertebral column resulting in CRS is determined by the later timing of the abnormal fluctuation in glucose homeostasis[15]. FFS has been easily detected by prenatal ultrasound in the first and the second trimester by detecting shortened or absent femora and severe micrognathia[5]. Although these babies have been reported to have problems in speech development[11] they have been of normal intelligence[5,11] and most of them have been ambulatory[11]. Motor development was retarded due to the malformations but upright posture and walking was accomplished without difficulty[3]. Therapy which improved the ambulation included functional rehabilitation sessions without surgery[16], limb lengthening surgery[12] and artificial limbs of various types[3]. There is limited published information available about adults with FFS with the exception of a case report of an adult female with FFS who completed her higher education as an above average student and has worked successfully as a secretary typist. She was able to walk well and drove a hand controlled automobile[3].

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