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Clinical Image of Amniotic Band Syndrome: A Rare Congenital Limb Deformity

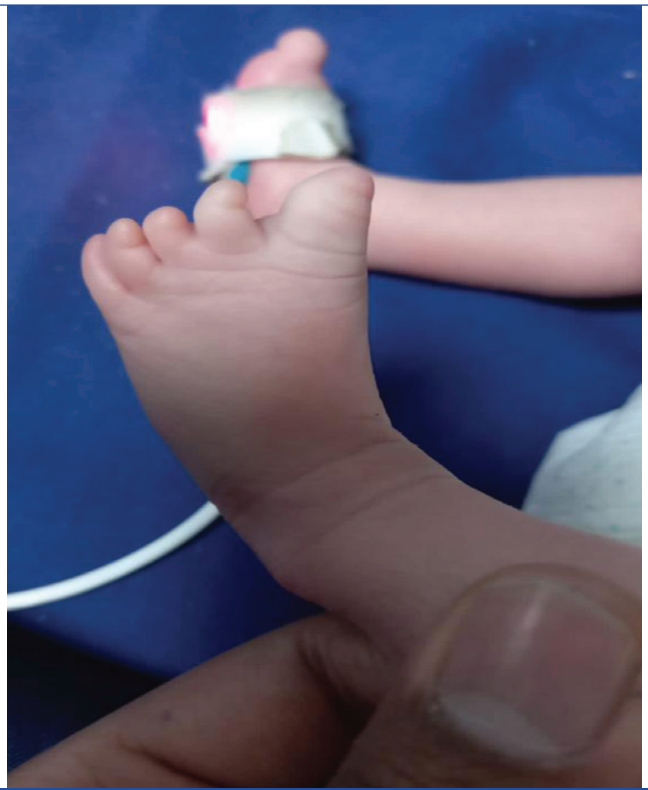
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Clinical Image - Amniotic Band Syndrome

A four-month-old male infant was taken to the outpatient department for immunisation and a routine check-up. A congenital foot deformity was discovered during a general health assessment. The examination of the left foot revealed defects in both the great toe and second toe. A circumferential constriction at the base of the great toe (hallux) suggested the presence of a conspicuous, hypoplastic, shortened form. Hypoplasticity and similar constriction deformities were observed in the second toe. The third, fourth, and fifth toes were normal in shape and length. There was no distal oedema, syndactyly, or other limb abnormality [Table/Fig-1]. The child was otherwise healthy, breastfed well, achieved age-appropriate developmental milestones, and remained playful and active.



[Table/Fig-1]: Clinical image of the left foot demonstrating hypoplasia and shortening of the great toe and second toe, with circumferential constriction bands at their bases, suggestive of Amniotic Band Syndrome. The remaining toes appear relatively normal, without syndactyly or distal oedema.

Following a comprehensive clinical examination, the male infant displayed typical somatic growth and age-appropriate psychomotor development. During his presentation, he had a weight of 5.7 kg, with 63 cm of length, 41.4 cm head circumference, 39 cm chest circumference, and 14 cm mid-upper arm circumference. The examination was systematic and revealed no other abnormalities.

The infant was born at term (38 weeks) and of appropriate gestational age, was born through a 24-year-old primigravida mother via vaginal delivery (birth weight-2.550 kg) from a non consanguineous marriage at Civil Hospital, Wardha, Maharashtra, India. He cried right after birth and had a smooth neonatal period. Although no prenatal ultrasonography was performed, the mother received routine antenatal care that included iron, folic acid, and calcium supplements as well as two intramuscular tetanus toxoid doses, and three antenatal visits at a primary health centre. No maternal fever, TORCH toxoplasmosis, other infections including HIV, rubella, cytomegalovirus, and herpes simplex infection, radiation exposure, or teratogenic drug intake was reported, nor was there any previous history of significant maternal illness or abortion. The family belonged to a low socio-economic background.

Congenital malformations or similar deformities were absent in the infant's family history. The left great toe and second toe had constriction deformities, but no corresponding syndromic features or other congenital anomalies, leading to the diagnosis of Amniotic Band Syndrome (ABS), which required further surgical evaluation and management.

The exact aetiology of ABS is not known. Fibroblasts, which are vascular impairments caused by early rupture of the amnion, and a variety of congenital malformations have been described as possible cause. The main pathogenic factor is thought to be the interruption of foetal blood flow. Misoprostol exposure in the first trimester and chorionic villus sampling before 10 weeks of gestation have each been associated with similar vascular disruption and foetal malformations [1]. Common symptoms include limb abnormalities, distal swelling, syndactyly, digital hypoplasia or digital amputation, residual fibrous tissue strands, and constriction rings. Distal circulation can be obstructed by narrow bands that cause tissue injury, depending on the location and severity of the constriction [2]. Therefore, the degree of involvement should be carefully evaluated during prenatal monitoring as well as follow-up. While imaging studies can be used to diagnose skeletal or soft-tissue abnormalities, a comprehensive physical examination is still necessary for assessing the severity of the deformities and guiding appropriate treatment. In patients with neurovascular compromise, early surgical intervention can lead to better functional and aesthetic outcomes [3]. The current case is special because, even though the pregnancy and neonatal period were uneventful, the defect was detected during a routine follow-up visit. There were no other thoracoabdominal, musculoskeletal or craniofacial abnormalities found in the deformity that was only present on one side of the left hallux and second toe (this was a mild and unusual form of ABS).

According to Patterson's classification [3], the findings were consistent with a simple constriction ring deformity without distal lymphoedema or amputation. Early detection of ABS is often aided by prenatal ultrasonography. Amniotic bands are often thin and challenging to identify, making prenatal identification difficult. Instead, diagnosis was made after delivery using distinguishing clinical signs instead of a preconceived ultrasound [4]. This case highlights the

importance of thorough physical examination in newborns and infants, particularly when antenatal imaging is not readily available.

The differential diagnosis of ABS involves uterine synechiae, which may be visible on ultrasonography but are not related to foetal constriction anomalies [5]. Another important factor is the presence of a residual gestational sac following the death of one foetus in utero during early gestation (vanishing twin syndrome). An empty or collapsed sac may be detected on prenatal ultrasonography in the vicinity of the surviving foetus. This finding is clinically relevant because early twin loss has been associated with foetal disruption sequences that may contribute to congenital anomalies in the surviving twin [6]. A circumvallate placenta can also produce membrane-like intrauterine structures without causing defects in the congenital limb constriction [7]. Congenital limb abnormalities that are indicative of developmental defects rather than amniotic band interference can be considered in the differential diagnosis of patients who have ABS, which may also be caused by genetic syndromes or exposure to teratogenic agents during early foetal development [8]. The presence of isolated circumferential constriction rings in the hallux and second toe, with no associated syndromic features, provided strong evidence for the diagnosis of ABS in this case.

A series of congenital circumferential constriction rings involving the hallux and second toe, along with associated digital hypoplasia and shortening, normal psychomotor development, a negative family history (such as gestational arrest), and other possible causes, was used in the final diagnosis. This case emphasises the importance of a thorough physical examination during routine paediatric evaluations, as certain rare isolated congenital anomalies may not be recognised until later in life. Early detection facilitates enhanced functional outcomes, efficient interdisciplinary management, and prompt referral.

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