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EDITORIAL

Congenital Vertical Talus

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Abstract

The talus is a very important bone in the foot skeleton. It represents the connection between the leg bones and the other bones of the foot. Its normal anatomy is correlated to its good function. The bone may be exposed to congenital anatomical variations and deformities, including congenital vertical talus (CVT), which affect the shape and movements of the foot. Although CVT is rare, it is important to keep in mind the possibility of CVT when examining a foot defect in newborns to avoid neglecting its treatment and subsequent complications and to avoid extensive surgical intervention.

Key Words: *Talus anatomy; CVT; Newborn foot; Orthopedic intervention*

Editorial

The talus is a small bone at the top of the hindfoot. It is considered one of the important pivotal bones for correct foot movement and thus the movement of the entire body. It connects the other foot bones below with the leg bones above [1]. The talus is formed of head, neck, and body. It may be exposed to some congenital deformities such as cases of congenital clubfoot and congenital vertical talus (CVT). These deformities can affect the proper function of the foot. Identifying these abnormal anatomical variations is essential for the proper diagnosis and management of any foot movement disorder [2-4].

CVT is also called congenital convex pes valgus, and more precisely teratologic dislocation of the talocalcaneonavicular joint [5]. It can lead to severe rigid form of congenital flatfoot [6]. CVT represents one of the rarest congenital bone abnormalities. The exact incidence of CVT is not known; and it is estimated that it affects about 1 in every 10,000 live births. This estimated figure is likely to be low because this malformation is not well recognized in neonates. Also, there are not enough large studies to determine the laterality or gender preference for this deformity [7]. Although CVT is a rare orthopedic condition, surgical repair is very challenging in neglected cases [6]. The biggest challenge in CVT case is that it is difficult to detect at birth, and therefore treatment may be neglected until signs of deformity appear, especially after walking. Misdiagnosis or unrecognized diagnosis of CVT may occur because most of the foot bones are not ossified

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at birth to show up on radiographs [4]. If left untreated, CVT often results in painful foot, abnormal gait, functional limitations, problems with wearing shoes and callosities around the displaced head of talus. Moreover, the surgical repair of neglected cases is more extensive with a lot of tissue released than if it had been diagnosed and treated at an early stage. This can lead to wound complications, postoperative stiffness and possibly under or overcorrection [8].

In case of CVT, the tip of the talar head is pointing down toward the ground instead of the normal pointing toward the toes. The typical radiographic and clinical picture is a rigid, severe pes planus associated with an abnormal talar axis-first metatarsal base angle [9]. It is characterized by dorsal dislocation of navicular bone over the head of talus associated with the valgus and equinus in hindfoot, dorsiflexion in the midfoot and abduction at the forefoot [4]. Surgical treatment is usually indicated when talonavicular joint is unreducible. Persistent talonavicular dislocation can be detected on lateral radiograph with the foot in maximum plantarflexion. However, this is difficult to recognize at birth, as the centers of ossification for many of the foot bones are still not visible. This includes the navicular that has not ossified until at least 9 months old. In this case, ultrasonography (US) has been suggested for diagnosis [10]. Cases with a reducible talonavicular joint may only need Achilles tendon lengthening and orthotics [11].

About half of the cases with CVT are idiopathic and can be referred to as isolated pathology. The exact causes are not clear, although in some cases there are familial tendencies linked to genetic mutations. The other half of the cases, which can be referred to as non-isolated pathology, are associated with syndromic neuromuscular conditions, such as myelomeningocele and carthrogryposis multiplex congenita. These are more severe cases with greater treatment challenges and a higher recurrence rate [12].

The big challenge in the CVT treatment journey is how to achieve the best desired results for a pain-free, plantigrade, mobile and functional foot [13]. Conservative management alone is not successful in most cases. Therefore, treatment is almost always a combination of serial casting with manipulation and later limited or extensive surgeries [12].

In some cases, especially in developing countries with low socioeconomic standards, children with CVT may be detected late, after they begin to walk, and thus develop a more severe deformity [14]. This includes painful stiff feet with poor propulsion and callus formation at the prominent talus head [7]. Surgical treatment is the reasonable solution for neglected cases [14]. In these neglected cases, secondary adaptive bony changes may occur, making anatomical reconstruction elusive, and thus surgical intervention will be more challenging than simply classic soft tissue release. The procedure may be associated with extensive surgical trauma and may require orthopedic correction including naviculectomy along with soft tissue release to minimize surgical trauma [15]. The traditional surgical procedures for treatment of CVT are long, intensive, risky, and often associated with complications. This complication may be overcorrection or undercorrection; in either case, additional surgery may be required that carries a higher morbidity risk. Therefore, there is a need to evaluate performing surgery without extensive manipulations to treat CVT [7].

In conclusion, the talus is a very important bone in the foot skeleton. It may be exposed to congenital anatomical variations and deformities, including CVT. Although CVT is rare, it is important to keep in mind the possibility of CVT when examining a foot defect in newborns to avoid neglecting its treatment and subsequent complications and to avoid extensive surgical intervention.

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