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Case Report

Penile amniotic band syndrome in newborns: does it require surgical correction?

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ABSTRACT

Amniotic band syndrome (ABS), also known as constriction ring syndrome, is a rare congenital condition characterized by fibrous bands that cause constriction, deformity, or disruption of fetal structures. Although limb and craniofacial abnormalities are commonly reported, involvement of the external genitalia, particularly the penile shaft, is exceptionally rare. We report a rare case of penile ABS in a newborn presenting with a constriction ring around the penile shaft. This anomaly may be overlooked during routine neonatal examination because skin folds can conceal the constriction. Early recognition is essential to evaluate the severity of constriction, penile skin integrity, distal circulation, and urinary function. Management should be individualized according to the depth and tightness of the ring and the presence of functional impairment. Superficial constriction without vascular compromise or urinary dysfunction may be managed conservatively with close follow-up. However, significant constriction, impaired circulation, skin injury, or functional impairment may necessitate surgical release. This case highlights the importance of meticulous neonatal genital examination and emphasizes that surgical correction should be guided by clinical severity and potential complications.

Keywords: Amniotic band syndrome, Penile amniotic band, Penile constriction ring, Congenital penile anomaly; Constriction ring syndrome

INTRODUCTION

Amniotic band syndrome (ABS), or constriction ring syndrome (CRS), has been acknowledged since approximately 300 BC.[1] First described by Montgomery in 1832, ABS is frequently associated with numerous bodily defects, exhibiting a diverse range of symptoms that vary based on the location and severity of the constrictive bands.[2] Currently, the incidence is estimated to be between one in 1,200 and one in 15,000 live births, with a prevalence of 1.8% among stillbirths.[3-5]

Bands are meroblastic fibrous strings that partially develop from the amnion, leading to disruption, deformity, and malformation. These can cause neurovascular issues and amputations in areas beyond the constriction, ultimately resulting in functional loss and a diminished quality of life.[6]

Seeds et al classified fetal anomalies associated with amniotic band syndrome (ABS) into three categories: limb, craniofacial and visceral defects.[7] Limb defects are particularly prevalent and are often caused by the entrapment of limbs by floating amniotic bands, leading to conditions such as constrictions or even amputations.[8] Major craniofacial issues associated with ABS include

acalvaria, acrania, anencephaly, encephalocele and various facial and nasal defects. Visceral abnormalities can range from omphalocele and gastroschisis to limb-body wall complex.[6-7] Moreover, the diminished quality of life resulting from ABS-related issues has been connected to depressive disorders, which may improve with surgical intervention.[9]

Familial inheritance patterns are not clearly visible, and cases appear to be sporadic. Various potential risk factors for ABS are linked to intrauterine insults and vulnerability to injury. These risk factors include prematurity, low birth weight, trauma, hemorrhage, amniocentesis, residing at high altitudes, unplanned pregnancies, first-time motherhood, maternal substance use (including tobacco) and maternal health issues during pregnancy such as gestational diabetes, anorexia, and infections.[10-12]

Many cases of Congenital Ring Syndrome (CRS) are infrequent and primarily sporadic, particularly concerning genital anomalies, with no documented chromosomal abnormalities.[6] Here, we introduce a rare instance of CRS that affects a newborn's penile shaft. In asymptomatic infants, this clinical feature might be overlooked during the newborn examination, as the skin over the shaft tends to fold in a non-erectile state, concealing the constriction ring.

CASE REPORT

Our patient was a male preterm neonate born at 26 weeks and day 1 gestational age, weighing 600 g, classified as extremely low birth weight (ELBW), via emergency cesarean section due to placental abruption. The initial APGAR scores were 5 and 8 at 1 and 5 min, respectively. The mother was a primigravida with a history of hyperemesis gravidarum, but her anomaly scan was normal, and the amniotic fluid volume was adequate. Following birth, the neonate was admitted to the Neonatal Intensive Care Unit (NICU) for respiratory distress, which was stabilized with ventilatory support and surfactant therapy. Complications during NICU stay included bronchopulmonary dysplasia, grade 2-3 intraventricular hemorrhage (IVH), neonatal thrombocytopenia, mild hyperbilirubinemia, and osteopenia of prematurity. However, the infant showed normal physical examination findings, progressive weight gain, and reached appropriate developmental milestones. A notable observation was a circumferential constriction ring of scarred tissue at the lower third of the penile shaft (Figure 1 and 2).

Physical examination revealed sclerema with skin thickening and edema of the prepuce without ischemia and a normal urine stream. The patient also had bilateral inguinal swelling with mild gurgling on the left side. The testis position was difficult to appreciate due to scrotal skin thickness, but normal penile erection with right lateral curvature (chordee) was noted (Figure 3). Imaging studies, including abdominal and scrotal ultrasound, indicated a bilateral inguinal hernia, which was successfully operated. Abdominal ultrasound showed normal kidneys and ureters. Centimetric orifice with intermittent omental fat herniation and retractile testicles, as well as normal kidneys and ureters.



Figure 1: Newborn's penis showing a circumferential constriction ring around the distal shaft, consistent with penile amniotic band syndrome.



Figure 2: Magnified view of the penile shaft showing a well-defined circular constriction groove with mild distal soft-tissue swelling.

The constriction ring did not require immediate surgical intervention because of the absence of vascular complications or urethral stricture. Prepuce edema was reassessed regularly, and surgical repair of the chordee was considered after 12 months unless complications arose. The patient was discharged at 3.5 months of age, feeding well on full mixed feeds, and the parents were instructed to monitor the urinary stream. Follow-up was scheduled at a combined pediatric clinic with the pediatric surgical team. The edema on the penis remained unchanged.

Overall, the growth and neurodevelopmental assessments were within normal limits.



Figure 3: Newborn with penile constriction ring visible and the genitalia otherwise intact with right lateral curvature (chordee).

DISCUSSION

Amniotic band syndrome encompasses a range of fetal abnormalities resulting from fibrous amniotic bands. It can affect various parts of the body, including the limbs, skull, face, torso and abdomen. This condition may occur alone or in various combinations, culminating in what is known as a body stalk anomaly. Amniotic band syndrome is a rare congenital condition; however, Acquired Constriction Ring Syndrome (ACRS), also known as hair-thread tourniquet syndrome, must be considered when diagnosing constriction lesions in infants. Notably, 80% of ACRS cases occur in infants under 2 months old and are marked by circumferential constriction of any appendage, such as toes or genitals, by human hair or fibers from clothing. ACRS is believed to have a congenital origin, with hair likely originating from early fetal shedding or hair displaced by fetal movements. Additionally, constriction rings can develop after birth if fingers or limbs become entangled with environmental hair or fibers.[13]

The first reported case of ABS affecting the penis was documented by Chen et al.[14] They reported a newborn with significant ring constriction on the fetal penile shaft, which led to urethral stricture, resulting in distal obstructive uropathy and prune-belly syndrome. In contrast, our report shows no signs of vascular compromise or urethral obstruction due to the constriction ring. The second case, presented by Ting et al involved a full-term newborn with penile ABS but no other complications, exhibiting normal erectile function and an adequate urinary stream, similar to our case.[15]

The precise mechanism underlying ABS is not fully understood and is probably influenced by multiple factors.[16] Currently, there are no identified genetic causes or predispositions for the condition, nor have any patterns emerged regarding sex or race/ethnicity associations.[17] The pathogenesis of constriction rings has puzzled researchers for centuries, leading to various theories but no definitive answers. Each proposed theory has its own shortcomings. There are three primary theories regarding the causes of amniotic constriction bands: intrinsic, extrinsic, and vascular. The intrinsic theory, introduced by Streeter in 1930, suggests that both abnormalities and fibrous bands arise from disruptions in the developing germinal disc during early embryogenesis.[18] This theory often explains significant craniofacial deformities, body wall defects, and internal organ abnormalities.

Torpin proposed the extrinsic theory in 1965, suggesting that the rupture of the amniotic sac leads to the formation of amniochorionic mesodermal bands, which can cause amniotic constriction bands.[8,19-21] In 1981, Van Allen introduced the vascular theory, indicating that both internal and external defects may arise from vascular disruptions. Various traumatic events, such as direct injury, amnion rupture, amniocentesis or teratogen exposure during 4–6 weeks of gestation, can hinder fetal development by interrupting blood supply, resulting in hemorrhagic necrosis and circulatory collapse. The timing of these insults plays a crucial role in determining the resulting abnormalities.[22,23] Research has shown that vascular compromise may be a key factor in craniofacial and abdominal wall defects.[20,24–26] The extrinsic theory seems to be relevant to our unique case.

Diagnosing Amniotic Band Syndrome (ABS) prenatally presents significant challenges. Seeds et al. suggested that ABS should be considered when gross fetal anomalies are observed during fetal sonography.[7] Notably, 3D ultrasound imaging has proven effective in accurately identifying the spatial relationship between bands and the fetus's body, facilitating early diagnosis of ABS during early gestation.[27] Most of the time, the amniotic band itself cannot be demonstrated by ultrasound but shows the consequences of the amniotic band. Commonly affected areas include the extremities, leading to conditions such as absent digits, amputations and malformed limbs. Additionally, facial clefts, encephalocele, spinal defects, abdominal wall anomalies or underdeveloped organs may be observed. The wide spectrum of possible anomalies and their numerous combinations result in a highly variable presentation of ABS, often leading to underdiagnosis. As ABS is primarily a clinical diagnosis, it is crucial for pediatricians caring for newborns to recognize these rare band-related genital defects and ensure long-term follow-ups to avoid urogenital morbidity.

CONCLUSION

Penile amniotic band syndrome is an exceptionally rare congenital anomaly that requires careful neonatal genital

examination to ensure early diagnosis and prevent potential urological complications. Management should be individualized according to the severity of constriction and the presence of vascular or urinary impairment. Conservative management may be appropriate in selected asymptomatic cases, provided close clinical follow-up is maintained. Surgical intervention is warranted when tissue integrity or function is threatened. Distinguishing congenital amniotic bands from acquired constriction rings is also essential for appropriate management and prevention of long-term morbidity.

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REFERENCES

1. Poeuf B, Samson P, Magalon G. Syndrome des brides amniotiques [Amniotic band syndrome]. Chir Main. 2008;27(1).
2. Montgomery WF. Observations on the spontaneous amputation of the limbs of the fœtus in utero, with an attempt to explain the occasional causes of its production. Dublin J Med Chem Sci. 1832;1(2):140-4.
3. Capone AC, Balasundaram N, Caouette-Laberge L, et al. Novel techniques for surgical management of abdominopelvic constriction rings in amniotic band syndrome. Plast Reconstr Surg. 2015;135:563-8.
4. Chiu DTW, Patel A, Sakamoto S, Chu A. The impact of microsurgery on congenital hand anomalies associated with amniotic band syndrome. Plast Reconstr Surg Glob Open. 2018;6.
5. Taub PJ, Bradley JP, Setoguchi Y, Schimmenti L, Kawamoto HK Jr. Typical facial clefting and constriction band anomalies: an unusual association in three unrelated patients. Am J Med Genet A. 2003;120:256-60.
6. Chandran S, Lim MK, Yu VY. Fetal acalvaria with amniotic band syndrome. Arch Dis Child Fetal Neonatal Ed. 2000;82(1). doi:10.1136/fn.82.1.f1.
7. Seeds JW, Cefalo RC, Herbert WNP. Amniotic band syndrome. Am J Obstet Gynecol. 1982;144(3):243-8.
8. Torpin R. Amniochorionic mesoblastic fibrous strings and amnionic bands: associated with constricting fetal malformations or fetal death. Am J Obstet Gynecol. 1965;91:65-75.
9. Kolasinski J, Kolenda M, Kolasinska D. Amniotic band syndrome in an adult combined with persistent depressive disorder. Plast Reconstr Surg Glob Open. 2021;9.
10. Koskimies E, Syvänen J, Nietosvaara Y, Mäkitie O, Pakkasjärvi N. Congenital constriction band syndrome with limb defects. J Pediatr Orthop. 2015;35:100-3.
11. Madan S, Chaudhuri Z. Amniotic band syndrome: a review of 2 cases. Ophthalmic Plast Reconstr Surg. 2018;34.
12. Syvänen J, Raitio A, Nietosvaara Y, et al. Risk factors and prevalence of limb deficiencies associated with amniotic band sequence: a population-based case-control study. J Pediatr Orthop. 2021;41.
13. O'Quinn JC, Friedman RL, Wilms KL. Acquired constriction ring syndrome. J Am Podiatr Med Assoc. 2006;96(3):253-5.
14. Chen CP, Liu FF, Jan SW, et al. First report of distal obstructive uropathy and prune-belly syndrome in an infant with amniotic band syndrome. Am J Perinatol. 1997;14(1):31-3.
15. Ting YS, Mukkam RP, Chandran S. Constriction ring of the penis in a newborn infant: a rare form of amniotic band syndrome. Clin Case Rep. 2022;10.
16. Weinstein B, Hassouba M, Flores RL, Staffenberg DA, Gordon CB, Runyan CM. Digital-facial translocation in amniotic band sequence: evidence of the intrinsic theory. J Craniofac Surg. 2018;29(7):1890-2.
17. Mukherjee PM, Natera M, Drew H, Creanga A. Amniotic band syndrome: a multidisciplinary care approach to the treatment of a rare case. Cleft Palate Craniofac J. 2019;56(1):105-9.
18. Streeter GL. Focal deficiencies in fetal tissues and their relation to intra-uterine amputation. Contrib Embryol Carnegie Inst. 1930;22:1-44.
19. Levy PA. Amniotic bands. Pediatr Rev. 1998;19:249.
20. Lockwood C, Ghidini A, Romero R, Hobbins JC. Amniotic band syndrome: reevaluation of its pathogenesis. Am J Obstet Gynecol. 1989;160(5 Pt 1):1030-3.
21. Kim JB, Berry MG, Watson JS. Abdominal constriction band: a rare location for amniotic band syndrome. J Plast Reconstr Aesthet Surg. 2007;60(11):1241-3.
22. Higginbottom MC, Jones KL, Hall BD, Smith DW. The amniotic band disruption complex: timing of amniotic rupture and variable spectra of consequent defects. J Pediatr. 1979;95(4):544-9.
23. Webster WS, Lipson AH, Brown-Woodman PD. Uterine trauma and limb defects. Teratology. 1987;35(2):253-60.
24. Herva R, Karkinen-Jääskeläinen M. Amniotic adhesion malformation syndrome: fetal and placental pathology. Teratology. 1984;29(1):11-9.
25. Hunter AG, Carpenter BF. Implications of malformations not due to amniotic bands in the amniotic band sequence. Am J Med Genet. 1986;24(4):691-700.
26. Van Allen MI, Curry C, Gallagher L. Limb body wall complex: I. Pathogenesis. Am J Med Genet. 1987;28:529-48.
27. Nardozza LM, Araujo Junior E, Caetano AC, Moron AF. Prenatal diagnosis of amniotic band syndrome in the third trimester of pregnancy using 3D ultrasound. J Clin Imaging Sci. 2012;2:22.

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