Congenital Constriction Bands in the Upper Extremities

By Ann Van Heest, M.D., orthopedic surgeon specializing in care of hands and upper extremities

Overview
Congenital constriction bands are also called amniotic bands, Streeter’s dysplasia or ring constriction syndrome. They occur in anywhere from one in 1,200 to one in 15,000 births (Can J Plast Surg. 2008 Winter; 16(4): 221–223) and appear in the upper extremity or lower extremity or both. The level of deformity ranges in severity, from simple constriction bands to constriction bands with secondary distal deformity or lymphedema, constriction bands with distal fusion of parts (syndactyly), or amputation distal to the constricting band.

Diagnosis
Congenital constriction bands are readily apparent at birth during a clinical exam, so no diagnostic tests are needed. To confirm a diagnosis of congenital constriction band, a clinical diagnosis can be made based on the observation of multiple bands in multiple sites on multiple digits. Anything less indicates some other condition, such as failure of formation or syndactyly.

Treatment
Usually a baby is seen in the first three to six months of life, unless the constriction band is threatening blood flow (viability) of a digit. Then an immediate referral to an orthopedic hand specialist would be indicated.

If no other issues are present, syndactyly repair and constriction band repair surgery can be scheduled when the child is between 6 to 12 months. Often, the surgery is staged to preserve blood flow to the digits.

Release of a constriction band may also be staged, particularly if a circumferential ring band is present. In addition to syndactyly release with skin grafting, constriction band excision can be performed. To allow for better growth, a Z-plasty technique is used. The amniotic band is excised along with any abnormal tissue, and the incision is closed. The patient will be followed up periodically to ensure his or her development is appropriate. If necessary, the child may be referred for physical and occupational therapy. Typically, outcomes are excellent.

Key Insights
- Congenital constriction bands are readily apparent at birth; no diagnostic testing is required.
- True congenital constriction bands meet these criteria: multiple bands in multiple sites affecting multiple digits.
- Repair surgery may be staged: release syndactyly, then release constriction bands.
- Postsurgical outcomes are excellent.
Congenital Constriction Bands in the Upper Extremities

About InBrief

InBrief has been developed by pediatric orthopedic specialists at Gillette Children’s Specialty Healthcare as a resource for primary care providers. If you have comments or questions, please contact Jason Kelecic, D.P.T., program manager, Center for Pediatric Orthopedics, at jkelecic@gillettechildrens.com.

Fig. A – Baby Girl
A congenital band affected development of this child's left hand: the thumb and third digit are incomplete, and digits 4 and 5 have syndactyly. Only the index finger is relatively normal.

Fig. B – Baby Girl
(right hand of the child shown in Fig. A) As a result of a congenital band, digits 3 and 4 have syndactyly, and the index finger has a terminal amputation.

Fig. C – Baby Boy
Banding affects two areas of this boy’s arm—a key indicator of congenital constriction bands.