Interesting Case Series

Thumb Duplication in a 12-Month-Old

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DESCRIPTION

A 12-month-old infant presents with a right-sided radial polydactyly.

NEXT

QUESTIONS

1. **Which is the appropriate classification for this deformity?**
2. **Which population groups are at highest risk for this deformity?**
3. **Which surgical approach is utilized to repair this defect?**
4. **Which late effects should be considered following this operation?**

DISCUSSION

The Wassel classification system (Table 1) is a useful method for classifying duplicated thumbs. Wassel's original system, first published in 1969, describes 7 classes of thumb deformities with the duplication in each class occurring at different levels along the bones of the thumb. This system replaced that of Millesi's, which only described 5 types of thumb duplication. The case presented can be classified as a Wassel type II thumb duplication. It consists of a completely duplicated distal phalanx down to the interphalangeal joint. Wassel type IV deformity is the most common radial polydactyly with Wassel type II being the second most common.

Table 1. *The Wassel classification system*

Wassel type	Description
I	Bifid distal phalanx
II	Duplicated distal phalanx
III	Bifid proximal phalanx
IV	Duplicated proximal phalanx
V	Bifid metacarpal
VI	Duplicated metacarpal
VII	Triphalangism of one of the involved digits

Thumb duplication is a common congenital abnormality of the hand, accounting for 6.6% of all hand malformations. Radial polydactyly is more common in whites and ulnar polydactyly is more prevalent in Africans. In fact, an ulnar polydactyly in a white individual is often indicative of an underlying syndrome (radial polydactyly is often also associated with underlying syndromes).

For aesthetic reasons, the smaller duplicated part should be removed, but simple ablation is not adequate. Many times the collateral ligaments, extensor tendons, flexor tendons, and/or joint of the digit must be reconstructed to correct significant radial deviation. If one of the thumbs is obviously larger than the other, it warrants preservation of the larger one with excision of the smaller one and the reconstruction of the aforementioned anatomy. However, if the 2 thumbs are of the same size, a Bilhaut-Cloquet procedure may be considered, in which a central wedge is resected to bring the 2 digits together, including the nail bed. This procedure can present a challenge due to periarticular tightness and difficulty in judging the size of the parts in relation to the size of the reconstructed thumb that has to be preserved, making closure difficult. A wide, deformed thumb may be the aesthetic result, although function may be acceptable. Because of these problems, the usage of Bilhaut-Cloquet procedure is limited.

This was an interesting case because the extra thumb was so hypoplastic that it resembled a pouce flottant thumb. Its removal was uneventful, except for an artery leading to the hypoplastic thumb that was ligated before removal (a single artery is the most common vascular presentation in an extra thumb). The *primary deformity* in Wassel type II duplications is that the useful thumb is significantly deviated radially at the interphalangeal joint (anything more than 25° of deviation affects the cosmetic appearance). The favored approach to this deformity includes fixation of the deviated thumb in an anatomically correct position, which was performed in this case. The extensor pollicis longus tendon was found attached to the extreme radial side of the good thumb, necessitating its release and reattachment to the periosteum of the dorsal base of the midportion of the thumb. The collateral ligaments did not need reconstruction.

Postoperatively, the primary concerns in thumb duplications are pulp atrophy, scar hypertrophy, joint instability/deformity, web space contracture, and joint stiffness. In Wassel type II duplications, the most common sequelae are joint instability and pulp atrophy. Most functional impairment comes from a persistent radial deviation of the remaining thumb.

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