

A1: Complete aplasia of both thumbs. There is also a duplication anomaly of the terminal phalanx of the left index finger.

A2: Pinch grip is impossible and a side-to-side grip is substituted.

A3: Aplasia or hypoplasia of the thumb is often associated with other malformations. These include anomalies of the carpus, club hand due to aplasia or hypoplasia of the radius, radioulnar synostosis, Fanconi's anaemia and Holt-Oram syndrome. Thalidomide caused an increased incidence. This child had Crigler-Nagar syndrome and bilateral club feet.

A4 The classification system developed by Blauth¹ and modified by Manske et al² is used to stratify the extent of the structural deficiencies :

Type 1 – Minimal shortening and narrowing.

Type 2 – Narrowing of web space between thumb and index, hypoplasia of intrinsic and thenar muscles, instability of metacarpophalangeal joint.

Type 3 – Type 2 features and :

Type 3A – Abnormal extensor tendons, hypoplastic metacarpal, stable carpometacarpal joint, or

Type 3B – Abnormal extensor tendons, partial aplasia of metacarpal, unstable carpometacarpal joint.

Type 4 – Floating thumb with rudimentary phalanges attached to the hand by a small skin bridge.

Type 5 – Absent thumb, as this case illustrates.

Answer 5: Operative treatment aiming to correct the grip disability and improve cosmesis is preferred especially in bilateral cases of complete thumb aplasia.

Discussion

Congenital upper limb anomalies are seen in 1 in 600 live births. Only 10% have significant functional or cosmetic deficits. Complete aplasia of the thumb is very rare. The functional and cosmetic impairment it causes are significant and more pronounced since the condition is bilateral as in this case.

Toe to thumb transfers by microvascular surgery have been tried. Result have been unsatisfactory since, unlike traumatic thumb amputation, there are no neural, musculotendinous or skeletal structures on which to place the transferred toe.

Hentz and Littler³ recommend pollicization of the index by rotation, angulation and shortening osteotomy of the metacarpal. This technique does not shorten the digit sufficiently nor creates an adequate interdigital space.

The method of choice to reconstruct aplastic thumb is pollicization of the index finger by transposition on a neurovascular pedicle. The technique described by Buck-Gramcko⁴

emphasizes three basic parts of equal importance:

- transposition of the index on its neurovascular pedicle.
- readjustment of the skeleton with shortening, rotation and abduction.
- reconstruction of muscle stabilization.

References

1. Blauth W. Der hypoplastische Daumen. Arch. Orthop. Unfall-Chir. 1967; 62: 225-246.
2. Manske PR, McCarroll MR, James M. Type 3A hypoplastic thumb. J Hand Surg 1995; 20A: 246.
3. Hentz VR, Littler JW. Abduction-pronation and recession of second (index) metacarpal in thumb agenesis. J Hand Surg 1977a; 2: 113-117.
4. Buck-Gramcko D. Pollicization of the index finger: method and results in aplasia and hypoplasia of the thumb. J Bone Joint Surg 1971; 53-A: 1605.

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