

# Towards Fulfilling the Reconstructive Surgical Needs of Children

An initiative of Ganga Hospital, Coimbatore

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*Editorial*

## Diversity - Inclusion and the Hand Surgeon



*Holding a ball with the thumb reconstructed using microvascular great toe transfer.*

Diversity, inclusiveness and equity are words that are often used these days. Rightly so, because as a nation advances economically, it will be valued only on the basis of how it treats its less fortunate subjects.

The **Third of December** of every year is celebrated as **‘International Day of People with Disability’**. The United Nations has announced this year’s theme for the day as “Amplifying the leadership of persons with disabilities for an inclusive and sustainable future”.

A hand surgeon can perform a great role in making this lofty goal a reality. Most of the times, hand surgeons are involved in enhancing the function of the patients whose hands they operate. When we make a thumb for a child born with absent thumb, or lengthen the digits

of a child born with short or absent fingers we enhance the pinch and grip strengths. It leads to a gross reduction in disability. It is also astounding to note what the children could do with what we provide. Many a time we look up with joy and surprise. The best way to provide a sustainable future for such children is to reduce their disability. We are blessed to be able to do this each time we pick up the knife to operate on a child to provide a better hand.



*The disability due to loss of thumb through the metacarpophalangeal joint is 25%. Microsurgery by toe transfer almost reduces the disability to zero.*

At Ganga, we go a step further, taking efforts to include them. More than 20 differently abled people are employed in our hospital in positions where there is a great deal of public and patient interaction. That they do it with ease gives them confidence in themselves and invokes a sense of pride in us. In addition, we help children with congenital differences or children who suffer serious hand injury to gain admission in professional colleges to pursue their dreams. These children qualify on the basis of their sterling academic performance but they view the medical examination for eligibility as a potential hurdle. We bat on the side of children, providing confidence to them and reassuring the establishment and institutions that these children will be able to take on the responsibilities that they have to shoulder in the process of doing their courses. All of them have justified our trust.

This month's Ganga Little Hands provides information as to how we have created better hands for children who are born with less than a perfect 10. Next time you see a child with less than a perfect 10, think of a Hand Surgeon.

**Dr S Raja Sabapathy**  
**Dr Monusha Mohan**  
 (Editors)

## Reconstruction of Short Digits

Children born with short digits have functional impairment of the hand if there is involvement of the thumb or multiple fingers. The non-microsurgical options available for reconstruction are distraction lengthening and non-vascularized toe phalangeal transfer for short digits in constriction ring syndrome, symbrachydactyly and cleft hand and pollicization of the index finger for severe hypoplastic or underdeveloped thumbs.

Though microsurgical option like a free toe transfer is a well-established option for post-traumatic digital loss in children, this procedure in congenital hand anomalies, needs good surgical planning and preoperative parental counselling. Conditions like constriction ring syndrome have intact proximal structures, but anomalies like symbrachydactyly have hypoplastic or absent structures proximal to the level of amputation. Microvascular toe transfer should be in the armamentarium of any paediatric hand surgeon for reconstruction in congenital hand anomalies.



*A one and a half years old boy with symbrachydactyly of his right hand with no phalanges in any of the digits.*

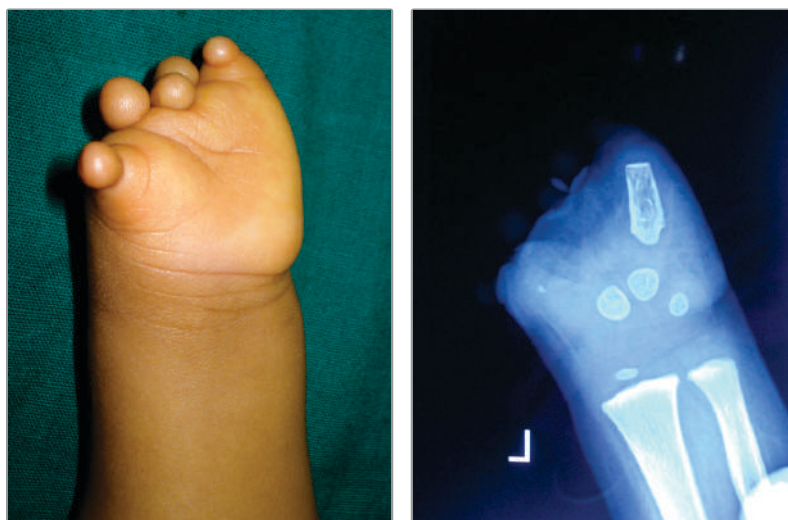


*Proximal phalanges from the toes of both feet were harvested to reconstruct all the five digits*



*At 4.5 years after the surgery, the digits were stable with improved hand function. Radiographically, the phalanges showed good growth with no resorption.*

In another patient with symbrachydactyly, we combined the techniques of non-vascularized toe phalangeal transfer (non-microsurgical) and microsurgical toe transfer, in reconstructing the hypoplastic digits. She had a short hand with nubbins that had no bony skeleton within. First, we reconstructed the little finger (ulnar post) with a proximal phalanx harvested from the toe. After 2 years, we reconstructed the thumb using a microvascular free toe transfer using a second toe. Eight years after the toe transfer, the new thumb showed growth.



*Left hand of the girl with no digits*





*Creation of an ulnar post with a toe phalangeal bone graft*



*Creation of the thumb or the radial post with a microvascular free toe transfer*



*<https://gangahospital.com/symbrachydactyly>  
QR code for the link to the postoperative video  
showing improvement in their hand function.*

*At 8 years following free toe transfer.  
The disability was reduced considerably with surgery.*

SCIENTIFIC ARTICLE

**Nonvascularized Free Toe Phalangeal Transfers in  
Congenital Hand Differences : Radiological,  
Functional, and Patient/Parent-Reported Outcomes**

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R. Raja Shanmugakrishnan, MS, MRCS, DNB\*

*Our related publication in the Journal of Hand Surgery (American) published in 2021. Sabapathy SR, Mohan M, Shanmugakrishnan RR. Nonvascularized Free Toe Phalangeal Transfers in Congenital Hand Differences: Radiological, Functional, and Patient/Parent-Reported Outcomes. J Hand Surg Am. 2021;46(12):1124.e1-1124.e9. doi:10.1016/j.jhsa.2021.03.012*

## Did you know?

### Paediatric Trigger Thumb is no longer termed Congenital Trigger Thumb

Trigger thumb in children used to be called Congenital trigger thumb. But several prospective studies that screened thousands of newborns for trigger thumb (14,581 newborns collectively) could not find even a single case. Hence, in the 2020 update of the Oberg - Manske -Tonkin classification of congenital hand differences (endorsed by the International Federation of Societies for Surgery of the Hand), 'congenital' trigger thumb was removed from the classification. The condition is retermed as Paediatric trigger thumb.

Paediatric trigger digits result from stenosed flexor tendon sheath. A1 pulley thickening may be found. Hence it is believed to be due to a mismatch in the size of the flexor pollicis longus tendon size and A1 pulley. This leads to a flexion contracture of the thumb at the interphalangeal (IP) joint. Children do not have snapping symptoms like adults and thumb is the most commonly affected digit. There is a characteristic palmar mass palpable at the metacarpophalangeal joint, known as a Notta's node and it can be due to a tendon nodule or a thickened flexor tendon sheath.

If the thumb is retained in a flexed position at the IP joint for more than 3 to 6 months, we prefer to release the A1 pulley. Uncorrected, growth disturbances occur and we have found there is a radial deviation at the IP joint. Hence trigger thumbs which remain locked are surgically corrected.



*Trigger thumb with radial deviation at the interphalangeal joint*



*Excellent result after surgical correction. Appearance comparable with that of the other thumb.*

## Clinician’s Corner

### Limb Anomalies in Down Syndrome

An 8-years-old boy with Down syndrome was brought to us with sandal gap in his feet. The wide first web in foot is a characteristic feature of the syndrome.



*‘Sandal Gap’*

The craniofacial features were typical. The eyes were slanted and upturned with epicanthic eyefolds. The nose bridge was flat. The palate was high arched. The tongue was big and showed wrinkles. Iris did not have the Brushfield spots (white or gray spots around the edge of the iris). The boy had a healed transverse lower abdominal scar from a previous surgery done for vesicoureteric reflux/hydroureteronephrosis.



*Craniofacial features in Down Syndrome*

The hands in Down syndrome are short and broad. The Simian or single transverse palmar crease was absent in the child (absent in 40% of cases). However, the palmar creases were not normal looking. The distal palmar creases were straight and transverse. It is important to do a head-to-toe examination of any child with congenital or genetic conditions.



*Palmar creases in Down syndrome*



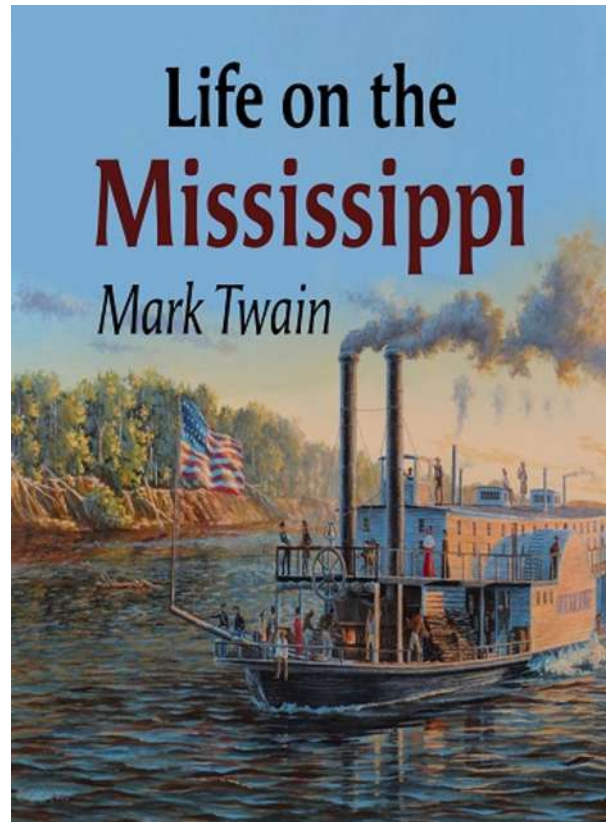
## Hand Vignettes

### Fingerprints

Fingerprints are impressions formed by the ridges on a finger. These are valuable tools used in criminology to identify suspects, link crime scenes and track the criminal records.

But, 10 years before they were recognized as a forensic tool, Mark Twain, the famous American writer, the author of the famous ‘The Adventures of Tom Sawyer’ and its sequel, ‘The adventures of Huckleberry Finn’, used fingerprint as a method to identify a criminal in one of his novels. In chapter 31, “A Thumb-print and What Came of It,” in his book, the ‘Life on Mississippi’ (1883), he has a character who uses a fingerprint to detect and prove a murderer’s identity. It was not until 1892 that fingerprints were used to solve a crime.

The first real-life crime solved using fingerprints was in Argentina in 1892 by detective Juan Vucetich, who confronted a murderess with her fingerprint, and she confessed.



## A Case of Epidermolysis Bullosa



The child has Epidermolysis Bullosa. This condition is caused by deficiency in the ability of the epidermis to anchor to underlying layers. Epidermis is the uppermost layer and is anchored to the dermis by the basement membrane. Protein structures required to maintain the proximity of the dermo-epidermal junction, may become defective or deficient secondary to gene mutations. The resultant malfunction manifests as skin fragility.

Trivial trauma can lead to erosions, blistering and ulceration of the skin. Even simple activities can cause sores in the hands and the wounds heal with scarring. With time the proximal interphalangeal (PIP) joints develop flexion deformity. Apart from the extremity ulcers and deformities, they can develop oral sores which may limit their feeding.

The boy in the pictures underwent release of the flexion contracture of the fingers in both hands with split thickness skin grafting in two stages.



*The flexion contractures at the PIP joints were released.  
Integra was placed and was replaced with split thickness skin grafts*

After release, we placed Dermal Regeneration Template (Integra), a synthetic skin substitute, over the raw areas. After removal of the superficial silicone layer after a few weeks, we placed skin grafts over the bed.



*The graft take was full and the fingers appeared good*



## Recently published articles on Paediatric Hand conditions / Surgery from our Department

1. A case report on Ellis-van Creveld Syndrome: Clinical, Embryological, Anaesthetic, and Surgical Implications

Case Report

### A Case Report on Ellis–van Creveld Syndrome: Clinical, Embryological, Anesthetic, and Surgical Implications

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Indian J Plast Surg

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Abstract

Postaxial polydactyly (PAP) in the form of rudimentary soft tissue masses is quite common. Management involves ligation or surgical excision. Rarely do literature discussions cover complex variants in which the extra finger is fully developed. Ellis-van Creveld syndrome (EVC) or chondroectodermal dysplasia is a rare disorder characterized by PAP. When chondral dysplasia encompasses PAP, dwarfism, and genu valgum, ectodermal dysplasia involves nails and teeth. We describe two EVC cases. When one had cardiac malformations, the other had dental anomalies. One of them underwent genu valgum correction and removal of the additional finger. The hand surgery proved complex due to fusion of its metacarpal with the fifth metacarpal. Pediatric Outcomes Data Collection Instrument (PODCI) scores at 1.5 and 2.5 years after hand and knee surgeries were excellent. A multidisciplinary approach is essential to achieve comprehensive care. Additional embryological research is necessary to elucidate the clinical manifestations described in this report.

**Keywords**

- postaxial polydactyly
- ulnar polydactyly
- Ellis–van Creveld syndrome

Can be accessed at <http://www.thieme-connect.com/products/ejournals/pdf/10.1055/s-0044-1793845.pdf>

2. Considerations in Correction of Wrist Deformity in Arthrogyrosis

Review

The Journal of Hand Surgery (Asian-Pacific Volume) 2024;29 • DOI: 10.1142/S242483552430007X

### Considerations in Correction of Wrist Deformity in Arthrogyrosis

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The wrist is affected in all the forms of arthrogyrosis and is a common site requiring surgical intervention. The wrist usually has a flexion and ulnar deviation deformity of varying severity. A flexion deformity of >40° results in a weak hand grip and gives an 'abnormal' look to the patient as a whole and hence, is a common reason for patients to desire surgical correction. However, as children tend to adjust to whatever posture they have as they grow, the most important thing a surgeon should be aware of, is when and whom not to operate. This article discusses all these possibilities in detail and provides authors preferred surgical plan. We have found a combination of volar fascia release, intercarpal wedge resection osteotomy and extensor carpi ulnaris to extensor carpi radialis brevis tendon transfer to be most effective and reliable. Patient and parental satisfaction with early surgical intervention is often satisfactory.

**Level of Evidence:** Level V (Therapeutic)

**Keywords:** Arthrogyrosis, Distal arthrogyrosis, Tendon transfer, Intercarpal wedge osteotomy, Wrist flexion deformity, Ulnar deviation deformity

3. Surgical Considerations in the Management of Constriction Ring Syndrome



**2026 World Congenital Symposium of  
Congenital Malformations of the Hand and  
Upper Limb.**

**February 25 - 28, 2026**  
Ganga Hospital, Coimbatore

This is the first time this will be held in this part of the world. Please mark the dates in your calendar.

Includes a Live Operative Workshop.

Contact : [rajahand@gmail.com](mailto:rajahand@gmail.com)



## Ganga Hand Operative Course

July 17 - 20, 2025 Ganga Hospital, Coimbatore



Includes live surgery, didactic lectures and small group discussions.

Look for the details soon...

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To get updates about our services for children with hand disorders, to grab the future issues of the monthly bulletin and to know what the department of Plastic, Hand and Reconstructive Microsurgery and Burns offers scan the code below.

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