



CENTRAL POLYDACTYLY OF FOOT-TOO TRIVIAL TO TARGET.

Plastic Surgery

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ABSTRACT

Presence of more than five digits in a limb is termed as polydactyly. Our patient presented first time in adulthood, despite facing problem in wearing slippers and aesthetic concerns since a long time. 20-year-old male presented to our department with complain of fusion of his 1st and 2nd toe in the right foot, along with a nubbin on the 3rd toe. The nubbin had a rudimentary nail which showed normal growth cycle like the rest of the nails. The extra digit was excised by giving an elliptical incision surrounding the digit. Post-operative recovery was satisfactory. The surgery which described initially to treat central polydactyly was wedge excision through dorsal racquet incision 1,2,7. Later on Allen¹³ corrected 3 cases of second ray duplication and one third ray by dorsal and plantar advancement flaps. In our case, we did a simple procedure of excision of central third ray polydactyly with primary closure.

KEYWORDS

Central Polydactyly Of Foot, Incomplete Syndactyly, Congenital Foot Deformities, Polydactyly Foot, Nubbin

INTRODUCTION:-

The presence of more than five digits in a limb is termed polydactyly. Polydactyly is a common congenital anomaly of the foot with an extensive range of presentation. Most patients are brought by their parents right after birth to seek an opinion. But this might not be the case every time. Our patient presented for the first time in adulthood despite facing problems with wearing slippers and aesthetic concerns for a long time. This can be the cumulated result of a lack of awareness in the region where he belongs and his family's superstitious beliefs associated with polydactyly and syndactyly. Polydactyly incidence is 1.7 per 1000 live births^{1,2}. There is a presence of extra digits or supernumerary digits affecting hands, feet or both. It may or may not be associated with genetic syndrome³. In non-syndromic cases, a positive family history is presented as autosomal dominance inheritance with variable penetrance, as seen in 30% of cases^{1,2}. In the Caucasian population, there are 0.3 to 1.3 cases per 1000 live births, while in African-American the incidence is 3.6 to 13.9 cases per 1000 births.^{4,5} Apart from the variation in genetic basis, there is a wide range of phenotypic presentations. An extra digit can range from anywhere between a skin tag to a well-formed functional digit. Depending upon the location of polydactyly, it is classified into pre-axial, central or post-axial³. In clinical practice, 79% of cases are post-axial involving lateral ray of the foot, then 15% of cases pre-axial involving first ray, but only 6% of cases of central polydactyly involving 2nd to 4th rays².

Belthur et al.⁶ described 6 metatarsal variations with duplicated digital phalangeal segments Y: shaped 5th metatarsal, T-shaped 5th metatarsal, widened 5th metatarsal head, complete 5th metatarsal duplication, short first metatarsal and widened first metatarsal head. Watanabe et al.⁷ classification was based on ray involvement and level of duplication. In his classification, foot polydactyly was divided into 3 groups: medial ray, central ray and lateral ray, with each group divided into tarsal, metatarsal, proximal phalangeal and distal phalangeal.

Patients presenting with polydactyly can be neonates brought by parents or adults seeking cosmetic correction. Apart from aesthetic concerns, the presence of polydactyly also makes it challenging for individuals to wear footwear. An aspect involving the treatment of polydactyly also includes mental distress that patients suffer due to the different appearance of the hand/foot. Thus, it is safe to say that polydactyly as an entity is full of variations from genotype and phenotype to patient concerns and age of presentation.

MATERIALS AND METHODS:-

A 20-year-old male presented to our department complaining of fusion of his 1st and 2nd toe in the right foot, along with a nubbin on the 3rd toe. The nubbin had a rudimentary nail, which showed a normal growth cycle like the other nails. Family history was negative for similar complaints. He had no other congenital anomalies. His late presentation was due to a lack of awareness in society and superstitious beliefs associated with extra digits and fused digits. Apart from the aesthetic aspect, he had difficulty in wearing slippers.

On examination, he had incomplete syndactyly (figure 1) reaching up to the distal phalanx of 1st & 2nd digits of the right foot, along with the presence of a nubbin on the inter-phalangeal region of the 3rd toe.

On radiography (Figure 2), he had simple incomplete syndactyly of the right 1st and 2nd digits. No bony evidence was found for the nubbin.

He was managed with syndactyly release, creation of the first webspace by proximally based dorsal rectangular flap, toe coverage with digital flap, and resurfacing of remnant raw areas with a full-thickness skin graft harvested from the left groin (Figure 3). The extra digit was excised by making an elliptical incision surrounding it.

Post-operative recovery was satisfactory (Figure 4). Flaps were healthy, and there was 0.5 mm of full-thickness graft loss, which was managed conservatively. The primary suturing of the excised central polydactyly was healed without any complications. The POP (Plaster of Paris) slab, which was given intra-operatively, was removed at 2 weeks, and the patient mobilized thereafter.

The patient has been on regular monthly follow-up for 6 months since the procedure. There is hypertrophy of skin grafts, which is being managed conservatively. The patient is now able to comfortably wear slippers and shoes.

DISCUSSION:-

The development of limbs starts at the end of the fourth week, with the lower limb 1 to 2 days later than the upper limb, which is 8. Hands and foot plates are formed in the sixth week, regulated by HOX genes, SHH genes, and retinoic acid.

The syndrome associated with polydactyly includes (cephalo polydactyly Noack, Carpenter and Grieg), Rubinstein-Taybi, Holt - Oram and Down syndrome⁹. The congenital anomalies associated with it include digital polydactyly, digital syndactyly, vertebral

anomalies, anorectal anomalies, tibial deficiency, cleft deformities of the lip and palate and cardiac defects.^{9,10}

Polydactyly Involves the right hand more than the left, upper limbs more than lower and left foot more than the right.^{11,12}

The surgery initially described to treat central polydactyly was wedge excision through dorsal racquet incisions^{1,2, and 7.} Later, Allen¹³ corrected 3 cases of second-ray duplication and one third-ray by dorsal and plantar advancement flaps.

In our case, we performed a simple procedure of excision of central third-ray polydactyly with primary closure. It presented as a nubbin with a rudimentary nail bed showing a normal growth cycle. It was 5mm x 3mm. Secondly, it was associated with the syndactyly of the first web space, which was also addressed with local digital flaps and skin grafting.

However, the extra digit did not hamper the patient's day-to-day activity; it was still a cosmetic concern for him.

The surgical procedure involving the excision of the extra digit was a small yet much-needed part of the whole treatment, but it improved the patient's mental well-being regarding his external appearance.

CONCLUSION:-

We would like to conclude that the case discussed was a rare presentation of central polydactyly along with syndactyly with delayed presentation in adulthood. Each case needs to be individualized keeping in mind the concerns of the patient. Thus, even a nubbin with no bony support cannot be considered a trivial issue and should be addressed in the same sitting.

Disclosures :-

Conflict of interest :- None

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Pre-operative image :-



Figure 1 (Pre-operative)



Figure 2 (X-ray foot AP view)

Intra-operative image :-



Figure 3 (intra-operative image)

Post-operative image :-



Figure 4 (Follow-up at 6 months)

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