Which Toe Component Should Be Excised When Treating Postaxial Polydactyly of the Foot?

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• **Postaxial polydactyly**
  - Congenital malformation of the forefoot (m/c)
  - Functional problem
    - Wide forefoot → Shoe fitting issues
  - Cosmetic problem
    - In asian culture, footwear is often removed at home

• **Surgery may be indicated**
  - Cosmetic, psychological, practical reasons
  - But, little information focusing on which toe should be excised in the literature

_Adler J. J. Foot Ankle Surg. 1997:36(2)
Purpose

- To evaluate the results of the operative treatment of postaxial polydactyly
- To present a treatment guideline respect to which toe should be excised
Materials and Methods

- Retrospective (between 2004 and 2010)
- 27 patients (bilateral : 9, 36 feet)
- M:F = 16:11
- Mean Age : 40.6 mos (range, 9-149 mos)
- Average F/U : 21.5 mos (range, 12-72 mos)
Materials and Methods

- **Morphologic Classification (Konno and Hirase)**
  - Type A (11 cases)
  - Type B-1 (12 cases)
  - Type B-2 (13 cases)

- **Radiologic Classification (Duplication level)**
  - Metatarsal type (12 cases)
  - Phalangeal type (24 cases)
Materials and Methods

• To select the dominant toe
  – Morphologic characteristics
    • Size, appearance
  – Radiologic configurations
    • Hypoplasia
    • Deviation at the MTP joint away from the long axis
Materials and Methods

- **Algorithm of toe selection**

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Postaxial Polydactyly

Can you decide to select the dominant toe morphologically and radiologically?

Yes

Non-dominant toe excision

No

Are all toes separated morphologically?

Yes

Lateral toe excision

No

Medial toe excision
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Materials and Methods

- **Op technique**
  - Lateral toe excision
    - Racket shape incision
  - Medial toe excision
    - Dorsal rectangular flap
    - Full thickness skin graft from the inguinal region
Results

• Satisfied : Unsatisfied = 34 : 2 (skin graft problem)
• Score overall patient’s or guardian’s satisfaction for recon. toe
  *(Questionnaire based on the PSQ-10)*

- Clinical Outcomes of Reconstructed Toes
  - Small size : 18 (50%) cases
  - Valgus deformity : 5 (14%) cases
Case 1 (1yr/M)

- Type B-1
- Dominent toe: Same
- Valgus deformity of the lat toe : preoperatively
- Med. toe was excised with web space reconstruction
Case 1 (1yr/M)

- **Valgus deformity gradually improved**: remodeling
Case 2 (2yrs/F)

- Type B-2
- Morphologic : Similar
- Radiological : Lat. toe was more dominant
- Med toe was excised with web space reconstruction
- A deep web & a natural foot lat. contour
Discussion

*Which toe component should be excised*

- *Lat. toe excision*
- *Natural form of the reconstructed toe*
- *No complication*
  - *poor blood circulation or eventual corn formation*

  *Nakamura et al (Jpn J Plast Reconstr Surg. 1991;34)*

- *Med. toe excision*
- *Better interdigital web space simultaneously*
- *Avoid scarring & sensation impairment of outermost foot*
- *Especially recommend med. toe excision in Type B-2*

  *Nogami et al. Clin Orthop Relat Res.1986;206*
Discussion

- In our study, **Algorithm of toe selection**

![Flowchart Image]

- **Postaxial Polydactyly** *(n=36)*
  - Can you decide to select the dominant toe morphologically and radiologically?
    - Yes
    - No

  - **Non-dominant toe excision** *(n=26)*
    - Are all toes separated morphologically?
      - Yes
      - No

      - **Lateral toe excision** *(n=3)*
      - **Medial toe excision** *(n=7)*
Discussion

• In our study,
  – **Type B, med toe excision**
    • Dorsal rectangular flap & full thickness inguinal skin graft
    • To create a deep & natural web
  – **Metatarsal type, med toe excision**
    • Reattach the intermetatarsal lig. to avoid a wide forefoot
  – **Type A, extra-toe excision**
    • Racket shaped incision to lat. toe excision
  – **Phalangeal type, extra-toe excision**
    • Trimming of metatarsal head, when it was wide to avoid valgus deformity
Discussion

- Valgus deformity
  - 32% (8/25 cases)
  - Med. toe excision of the phalangeal type, postaxial polydactyly


- **In our study**

  Med. toe excision: 3 cases (12%)
  - Joint surface of the MT head was trimmed medially
  - Full thickness skin graft was med side of the fifth toe
Conclusion

- Our algorithm for which toe should be excised
- Med. toe excision on type B
  → Surgical technique (Dorsal rectangular skin flap and FTSG)

- Achieve functional & cosmetic improvements
- Simultaneously web space reconstruction
- Natural foot lat. Contour and deep web space reconstruction.
THANK YOU FOR YOUR KIND ATTENTION !!!
Case 2 (2yrs/F)

- Type B-1
- Radiography
  - Med toe deviated at the MTP joint away from the long axis
- Lat. toe excision using racket shape incision
- Discomfort on recon. toe
  - Med. protuberant middle phalanx
  - While running or long distance walking