

CASE REPORT

POLYDACTYLY OF THE FOOT REPAIR WITH CIRCUMFERENTIAL RACQUET-SHAPED INCISION TECHNIQUE AND COLLATERAL LIGAMENT RECONSTRUCTION: CASE REPORT AND LITERATURE REVIEWS

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ABSTRACT

Introduction: Polydactyly of the foot is the most common anomaly in congenital diseases. This abnormality is characterized by the presence of additional digits outside the normal complement of the foot. Polydactyly has reported about 1 in 1,000 births. The Watanabe classification is used in assessing polydactyly in the feet as a fifth ray duplication. Various operating techniques can sometimes be an option. Each method has advantages and disadvantages that can be considered in the selection of surgical in the correction polydactyly.

Patient and Method: we report a case of polydactyly of the foot reconstruction using circumferential racquet-shaped incision, osteotomy and collateral ligament reconstruction that was carried out at Bahteramas Hospital, Kendari. A circumferential racquet-shaped incision design was performed over the sixth MTP joint. Complete excision of the lateral sixth toe was performed, followed by osteotomy of the fifth metatarsal lateral head with a micro-sagittal oscillating saw. The collateral ligament was reconstructed using ligamentoperiosteal flap and fixed using syringe needle to replace K-Wire.

Result : After postoperative control for 3 months the patient was declared good wound healing

Conclusion: Optimal surgical planning, good patient orientation and surgical techniques that are carefully considered are essential for optimal results. Herein, we report a case of polydactyly and racquet shaped incision technique performed to reconstruct the polydactyly.

Keywords: *Polydactyly; Circumferential Racquet-Shaped Incision; Collateral Ligament Reconstruction*

Latar Belakang: Polidaktili kaki adalah anomali yang paling umum pada penyakit bawaan. Kelainan ini ditandai dengan adanya angka tambahan di luar komplemen normal kaki. Polidaktili telah melaporkan sekitar 1 dari 1.000 kelahiran. Klasifikasi Watanabe digunakan dalam menilai polidaktili di kaki sebagai duplikasi sinar kelima. Berbagai teknik operasi terkadang bisa menjadi pilihan. Setiap metode memiliki kelebihan dan kekurangan yang dapat dipertimbangkan dalam pemilihan bedah dalam koreksi polidaktili.

Pasien dan Metode: Kami melaporkan kasus rekonstruksi polidaktili kaki menggunakan sayatan berbentuk raket, osteotomi dan rekonstruksi ligamen kolateral yang dilakukan di Rumah Sakit Bahteramas, Kendari.

Hasil: Eksisi lengkap dari jari kaki keenam lateral dilakukan, diikuti oleh osteotomi kepala lateral metatarsal kelima dengan gergaji osilasi mikro-sagital. Ligamentum kolateral direkonstruksi menggunakan flap ligamentoperiosteal dan difiksasi menggunakan jarum untuk menggantikan K-Wire.

Kesimpulan: Perencanaan bedah yang optimal, orientasi pasien yang baik dan teknik bedah yang dipertimbangkan dengan cermat sangat penting untuk hasil yang optimal. Kami melaporkan kasus teknik sayatan berbentuk raket yang dilakukan untuk merekonstruksi polidaktili.

Kata Kunci: *Polidaktili; Insisi Circumferential Racquet-Shaped; Rekonstruksi Ligamen Kolateral*

Conflicts of Interest Statement:

The author(s) listed in this manuscript declare the absence to any conflict of interest on the subject matter or materials discussed.

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INTRODUCTION

Polydactyly is characterized by the presence of additional digits outside the normal complement of the hand and foot in the form of one thumb and four fingers, this simple explanation belies the complexity and heterogeneity of the presentation of polydactyly.^{1,2} Polydactyly, or the presence of an extra digit, is one of the most common congenital anomalies of the hand and foot, with an incidence of approximately 1 in 1,000 births.³ Polydactyly of the fifth toe is the most common congenital malformation of the forefoot, and polydactyly of the fifth toe has been classified by Watanabe et al as fifth-ray duplication.⁴ Most cases are treated during childhood before age goes on. Adult cases are rarer, and surgical management of deformity is still debated⁵.

PATIENT AND METHOD

A 10-year-old girl presented with six toes on the left foot from birth. (Figures 1). On anteroposterior X-ray examination of the foot, there were proximal-distal left pedis phalanges on sixth toes. While metatarsal phalanges on fifth toes, with the conclusion that polydactyly of the left proximal-distal phalanges (Figure 2). There is a family history of polydactyly without any other complaints. Preparations before the operation that has been done are laboratory blood examination, chest X-ray, and consultation to the pediatrician and anesthesiologist. Consultation with a pediatrician shows that the patient does not suffer from a systemic disease that will interfere with the course of the operation. Consultation with anesthesiologists resulted in ASA I physical status, no contraindications to surgery. After regional anesthesia, we apply a tourniquet in the thigh area. The left leg is prepared and draped. Prophylactic antibiotics have been given to patients.



Figures 1. Clinical pictures of the patient

A circumferential racquet-shaped incision design was performed over the sixth MTP joint (Figure 3). Circumferential racquet-shaped incision is marked. The extensor tendon is identified and tenotomy performed. Start the incision of the dorsal capsule of the MTP joint. Continue to incise the plantar plate of the MTP joint, followed by careful dissection of the deep tissue layers and articular capsule liberation. Complete excision of the lateral sixth toe was performed, followed by osteotomy of the fifth metatarsal lateral head with a micro-sagittal oscillating saw. The collateral ligament was reconstructed using ligamentoperiosteal flap and fixed using syringe needle to replace K-Wire (Figure 4)¹³. Wound closure was performed with primary closure with 4/0 optime. A sterile compressive dressing with flexible self-adhesive wrap and the postoperative shoe was applied. Postoperative care included elevating the feet, analgesia, and inspection of the wound at 7 days.

RESULT

After performing postoperative control for 3 months the patient was declared good wound healing (Figure 5).



Figures 2. Radiologic pictures of the patient



Figures 3. Racquet shaped incision design for excision of polydactily

DISCUSSION

Polydactily accounts for 45% of congenital foot disorders. Patients with polydactily usually come to the surgeon with their parents to seek surgical treatment either for cosmetic reasons or because of difficulty finding comfortable footwear.⁶ Polydactily is a prevalent birth anomaly observed in the foot, and several classification systems have been suggested for this condition. Postaxial (fifth or little toe) polydactily is the most common type.⁷

Lister has identified six qualities that provide the normal thumb with its unique function capabilities : length, stability, sensibility, mobility, dexterity, and power.¹⁰ Collateral ligament stability is essential to the maintenance of congruous joint motion and proper digital axial alignment.¹¹



Figures 4. Using syringe needle to replace K-Wire



Figures 5. Three months post operative images

CONCLUSION

Optimal surgical planning, good patient orientation and surgical techniques that are carefully considered are essential for optimal results. Herein, we report a case of polydactyly and racquet shaped incision technique performed to reconstruct the polydactyly.

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REFERENCES

1. Chung, K. (2019). *Grabb and Smith's plastic surgery*. Lippincott Williams & Wilkins.
2. Bunnell S. *Surgery of the Hand* (4th ed). Philadelphia: Lippincott, 1964.
3. Guo, B., Lee, S. K., & Paksima, N. (2013). Polydactyly. *Bulletin of the Hospital for Joint Diseases*, 71(1).
4. Watanabe H, Fujita S, Oka I. Polydactyly of the foot: an analysis of 265 cases and a morphological classification. *PlastReconstr Surg*.1992;89:856-877.
5. Galois, L., Mainard, D., & Delagoutte, J. P. (2002). Polydactyly of the foot. Literature review and case presentations. *Acta orthopaedica Belgica*, 68(4), 376-380.
6. Fortems Y, De Smet L, Fabry G. Extra digit at the dorsum of the foot: hypoplastic central ray metatarsal duplication. *J Pediatr Orthop* 1996; 5B: 132-3.
7. Rafique A, Arshad A and Abu-Zaid A. Rare presentation of foot postaxial polydactyly. *J Foot Ankle Surg* 2014; 53: 331-334
8. Lui TH. Correction of postaxial metatarsal polydactyly of the foot by percutaneous ray amputation and osteotomy. *J Foot Ankle Surg* 2013; 52: 128-131. 5. Turra S, Gigante C and Bisinella G. Polydactyly of the foot. *J Pediatr Orthop B* 2007; 16: 216-220.
9. Nakamura K, Ohara K, Ohta E. A new surgical technique for postaxial polydactyly of the foot. *Plastic and Reconstructive Surgery*. 1996; 97(1): 133-138. DOI:10.1016/S0260-4779(98) 00022-3.
10. Lister, G. (1985). The choice of the procedure following thumb amputation. *Clinical Orthopedics and related research*, (195), 45-51.
11. Light, T. R. (1992). TREATMENT OF PREAXIAL. *Hand clinics*, 8(1), 161.
12. Talusan, P. G., Milewski, M. D., & Reach Jr, J. S. (2013). Fifth toe deformities: overlapping and underlapping toe. *Foot & ankle specialist*, 6(2), 145-149.
13. Baek, G. H. (2015, December). Surgical strategy for polydactyly of the thumb. In *BMC proceedings* (Vol. 9, No. 3, p. A10). BioMed Central