

ORIGINAL ARTICLE

Ray resection in paediatric population[☆]



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KEYWORDS

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Abstract

Aim: Evaluation of clinical and functional outcome of ray resection in paediatric population and description of key aspects of surgical technique.

Material and methods: We performed a retrospective review of all patients undergoing surgery between 2010 and 2015. Inclusion criteria: one or more ray resections of the hand and a minimum of one year follow-up. Evaluation of clinical characteristics, functional and cosmetic results, complications, need for psychological support and patient or family satisfaction.

Results: Four patients met the inclusion criteria. The mean age at surgery was 5 years (range, 1–14 years). Aetiology was: fibrolipomatous hamartoma, traumatic amputation, radial deficiency and complex syndactyly. Second ray was resected in three patients and third and fourth ray in one. No finger transfer was performed. No immediate post-operative complications were found at the final evaluation. None of them needed psychological support. All the patients showed excellent clinical and functional results with a high grade of satisfaction.

Discussion: Ray resection of the hand has been used as salvage procedure in patients with vascular lesions, tumours, trauma, infections or congenital malformations. There are only a few published studies including small samples in adults or case reports, with no references in the paediatric population.

Conclusion: Ray resection of the hand is a useful and safe technique in paediatric population, obtaining excellent cosmetic and functional results in those cases in which it is impossible to preserve one or more fingers.

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PALABRAS CLAVE

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Resección de radios de la mano en pacientes pediátricos**Resumen**

Objetivo: Valoración de los resultados clínicos y funcionales de la resección completa de los radios de la mano en población pediátrica y descripción de los aspectos técnicos más relevantes de la cirugía.

Material y método: Estudio retrospectivo observacional de pacientes intervenidos en el periodo comprendido entre 2010–2015. Criterios de inclusión: resección de uno o más radios de la mano y seguimiento mínimo de un año. Evaluación de las características clínicas, resultados funcionales y estéticos, complicaciones, necesidad de apoyo psicológico y grado de satisfacción.

Resultados: Cuatro pacientes cumplieron criterios de inclusión. La edad media fue de 5 años (rango 1–14 años). Las causas fueron: hamartoma lipofibromatoso, amputación traumática, deficiencia radial y sindactilia compleja. El segundo radio fue resecaado en tres pacientes y el tercer y cuarto radio en un paciente. No se realizó transferencia de radios adyacentes. No existieron complicaciones postoperatorias ni durante el seguimiento. Ningún paciente precisó ayuda psicológica. Todos presentaron excelentes resultados estéticos, funcionales y con un alto grado de satisfacción.

Discusión: La resección completa de uno o más radios de la mano se utiliza como técnica de rescate en pacientes con lesiones vasculares, tumores, traumatismos, infecciones o malformaciones congénitas. Las publicaciones existentes son pequeñas series en pacientes adultos o casos clínicos aislados, no existiendo apenas referencias en población pediátrica.

Conclusión: La resección de radios de la mano es una técnica útil y segura en la población pediátrica que proporciona excelentes resultados estéticos y funcionales en aquellos casos en los que es imposible la preservación de uno o varios dedos.

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Introduction

The complete resection of one or several rays of the hand is a technique used in those cases in which due to infection, tumour, trauma or congenital causes it is impossible to preserve the fingers. This was classically indicated in cases of necrosis due to ischaemia, severe dysfunction of the proximal interphalangeal joint and traumatic amputation at the level of the proximal finger in the adult population. This technique has not been very popular due to the resulting loss of strength and associated grasping capacity.¹ The presence of a finger that is painful and rigid, with sensitivity alterations and which is either too long or too short may affect hand function and dexterity.

The majority of publications on this technique are about small series of adult patients or isolated clinical cases,^{1–7} with hardly any references to a paediatric population.^{8–11} The decision to perform a resection of the rays of the hand is difficult for the surgeon as well as for the patient, and most especially for paediatric patients. The indication of surgery is often rejected at first by the parents, due to its social repercussions and affect on future occupations.

This work aims to evaluate the clinical and functional results of complete resection of the rays of the hand in children, and also describes the most important technical aspects of the surgery involved.

Material and method

A retrospective observational study of 4 patients operated in our hospital from 2010 to 2015. The inclusion criteria were: paediatric patients operated for the resection of one or more rays in the hand and with a follow-up period longer than one year. The average age of the patients was 5 years old (range 1–14 years). The reason for resection was macrosyndactyly associated with lipofibromatosis (Flatt type I macrodactyly), the after-effects of complex syndactyly, ray deficiency and traumatic amputation of the index finger following an animal bite (Fig. 1). In three of the patients ray resection was undertaken as the initial procedure, and in one case it was a secondary procedure. Surgery took place under general anaesthetic with an ischaemia sleeve. Skin flaps were designed including the ray to be resected, preventing scarring over the commissure. Finger veins and arteries were ligated and cut. The nerves were isolated and cut proximally in the fat of the palm to prevent neuromas. In all cases an extraperiosteal resection was performed of the ray, including the metacarpal, while preserving its base with the tendon insertions of the *extensor carpi radialis longus* or *extensor carpi radialis brevis*. The resection was distal to proximal and from the radial to the ulna, with shears. In the volar approach the superficial and deep flexor tendons were cut proximal to their insertion in the lumbrical muscles. The proximal resection

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