A Case Report of a Complex Form of Hand Pre-Axial Polydactyly

Eyad AbdulHafiz Nawwab, Faryal Suraya Rasheed, Tuqa Adil Alsinan*
Department of Plastic and Reconstructive Surgery, King Saud Medical City, Riyadh, Saudi Arabia

Corresponding author: Tuqa Adil Alsinan, Department of Plastic and Reconstructive Surgery, King Saud Medical City, Riyadh, Saudi Arabia. Email: taalsinan@alfaisal.edu

Received Date: 01 October, 2021; Accepted Date: 07 October, 2021; Published Date: 12 October, 2021

Abstract

Background: Polydactyly of the thumb is considered one of the most common hereditary of upper limb deformities. Several classification systems have been utilized to diagnose patients with polydactyly according to different factors such as the anatomical location or the genetic association. Surgical excision is the preferred choice of method for most types which showed around 88% of cases resulted in good and satisfactory outcomes, while 15% will require additional correction procedures to ensure the thumb's function.

Case Report: Here we report a case revolves around a Saudi young boy aged 5-year-old who presented to the Plastic clinic with an extra digit in right hand. He was diagnosed with a complex form of thumb polydactyly type-V based on the radiological findings according to the Wassel's classification system. After thorough investigations, the management plan was taken as a surgical excision of the extra digit to ensure proper thumb functioning and good cosmetic result.

Conclusion: The aim of this case report is to add more to the literature by reporting the satisfactory outcomes of surgical approaches based on the Wassel's classification system for different types of polydactyly. It highlights the advantages of this approach as it results in good long-term outcome and maintains the function of the thumb normally.

Keywords: Thumb Polydactyly; Complex Polydactyly; Plastic Surgery; Wassel Classification System

Background

Polydactyly of the thumb is considered one of the most common hereditary of upper limb deformities [1]. Usually it can be detected during the 14th week of gestation by an ultrasound imaging as an isolated form and rarely associated with genetic syndromes [2,3]. Up to 40% of hand function is by the thumb as it is highly important in opposing the other digits [2]. The incidence is more in male than female with 2.5:1 ratio [2]. The main presentation of polydactyly is a unilateral extra digit in the hand [1]. Several classification systems have been utilized to diagnose patients with polydactyly according to different factors such as the anatomical location or the genetic association [2]. The Wasse5's classification system classifies polydactyly based on its anatomical location either into simple or complex; or into preaxial in the radial or thumb side, postaxial in the ulnar side, or central, as well as its osseous structure into bifurcation or duplication of the digit [3,4]. It is assigned by Roman numerals according to the radiographical findings of the proximity of the bifurcation or the extension of the duplication, as the odd numbers indicate the bifid structures and the even numbers indicate duplicated bones respectively [4]. Surgical excision is the preferred choice of method for most types to stabilize the thumb by making it well-aligned for proper functioning, however, most of corrected digits will be thinner, shorter, and stiffer. Around 88% of cases showed good and satisfactory outcomes, while 15% will require additional correction procedures to ensure the thumb's function [2,5].

Case Report

A Saudi young boy aged 5-year-old presented to the clinic with an extra digit of the right hand since birth (Figure 1). He was diagnosed with a complex form of thumb polydactyly type-V based on the radiological findings according to the Wassel's classification system. He is a product of a full term normal vaginal delivery, otherwise healthy and medically stable. There was no history genetic diseases or similar conditions in the family. The rest of her history was unremarkable. Physical examinations were all within the normal limits.

For more investigations, the patient underwent a hand x-ray that depicted pre-axial Wassel type-V polydactyly; with proximal bifurcation of right first metacarpal bone and distinctly formed extra bi-phalangeal radial thumb (Figure 2 A,B,C). In the year 2020, the patient's family was counselled on surgical excision of the extra digit to ensure a proper thumb functioning and a good cosmetic result, which was done on November 2, 2020. With full aseptic precautions under general anesthesia and tourniquet control, an elliptical incision was made around the extra thumb base, osseo-periosteal flap was raised then proximal first metacarpal was separated from main first metacarpal by osteotomy. Extra extensor pollicis longus tendon was secured and utilized to reconstruct radial collateral ligament of ulnar thumb metacarpophalangeal joint through and additional curvilinear incision. No other significant muscle attachment was found. Tourniquet was deflated, hemostasis secured wound closed with absorbable sutures and thumb spica was applied in radial abduction. Patient was discharged home same day with clinic appointment. His thumb spica was removed after 4 weeks of surgery and occupational therapy was started (Figures 3, 4). Postoperatively, the procedure was tolerated very well with no immediate or late complications. The patient was examined after 3 months of the procedure with good passive and active motor function of the hand.

Figure 1: Preoperative photos of the right hand with extra digit.

Figure 2 A, B, C: Hand x-ray: showed pre-axial polydactyly, the Wasse5's Type-V.
Discussion

Polydactyly is one of the most common thumb deformities [1]. It usually classifies based on the osseous structures by the Wassel’s classification system to detect the preferred surgical intervention [3]. Excision of the extra digit is the best surgical approach in most patients as it results in satisfactory outcomes [2].

Several studies were conducted in reviewing the preferred classification system that leads to the suitable surgical approach. Since the year 1984 and up to 2008, several articles and cases were reported about the thumb polydactyly and its management. It was reported that around ninety-five cases in Hong Kong were classified based on the Wassel’s classification system and managed successfully with removal of extra digit and the osteotomy of the metacarpal joint. Moreover, polydactyly surgical correction associated with meticulous skeletal and soft tissue reconstruction maintained the function of the thumb, as well as resulted in satisfactory long-term outcomes [1,5,8]. Based on the literature, recent studies were conducted between the years 2015 and 2016 to review and to discuss the background and pathogenesis of polydactyly, as well as the Wassel’s classification system for radial polydactyly. It was concluded that classifying the type of polydactyly is important to apply the best surgical approach and to document the type clearly of the anomalies [2,4]. Meanwhile, several papers reviewed the management of thumb polydactyly in the United States, Netherlands, and Italy to ensure the suitable classification system and surgical approach in such patients. The proper surgical planning is required to get the best possible outcomes, in addition to that around 15% of patients need additional procedures even after surgical excision. Also, almost all types of polydactyly require reconstructive surgery to stabilize the thumb and some could be challenging [3,5,7].

Conclusion

The aim of this case report is to add more to the literature by reporting the satisfactory outcomes of classifying thumb polydactyly based on the Wassel’s classification system to apply the proper surgical approach. It highlights the advantages of this approach as it results in good long-term outcome and maintains the thumb function normally [8].

Conflicts of Interest

The authors whose names are listed above certify that they have NO affiliations with or involvement in any organization or entity with any financial interest, or non-financial interest in the subject matter or materials discussed in this manuscript.

References