

## A novel technique to widen the 1st web space by using 'spare parts' of thumb polydactyly

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**Keywords:** 1st web space contracture; local tissue flaps; first web release

### Abstract

First web space contracture causes significant morbidity and hence their release is important to make use of normal hand functions. First web space helps in improving the grasp. There are several methods of normalizing the 1st webspace. In this article we are describing a local flap that uses the spare tissue of the thumb polydactyly for recovering the defect created from the release of the first web contracture, thereby providing coverage with a tissue that has good vascularity and also giving sensation to the resurfaced part.

### Introduction

Contractures of the first web space can cause distorted hand functions. They cause alteration in the normal anatomy of the thumb causing decreased thumb movements. There are various causes of 1st web space contracture which commonly include trauma, burns, etc.

The first web space is typically found in form of a tetrahedron, the distal skin forms a curve that extends from the index MCP joint to an area just distal to the thumb MCP joint [1]. Muscles such as adductor pollicis, first dorsal interosseous, and also flexor pollicis brevis lies within this webspace. These muscles help in augmenting the various thumb movements. The first web space measures around 100 degrees [2].

In the following study, the spare skin in accessory thumb has been used for coverage of thumb and thumb skin was used for the creation of 1st webspace. This novel technique is been reported for the first time.

### Case presentation

4 years old female child presented with syndactyly of right 3rd webspace and left-hand radial polydactyly (Wassel type 5) along with 1st web space contracture. Preoperative evaluation and investigations were done. Written informed

consent was taken from parents, preoperative photographs were taken (Figure 1) and the patient was taken for operation under general anaesthesia.

Tourniquet was applied on the left upper limb. Stay sutures were taken. The incision was marked as shown in the figure. Flap consisting of the skin and dorsal tissue was raised. The bones of the radial accessory digit were excised. The collateral ligaments of the radial side were repaired. Incision release of the 1st web space contracture was done.

A flap consisting of skin and tissue from the dorsum of the retained thumb was raised and transposed to resurface the



Figure 1. Preoperative images



Figure 2. Post operative images

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Received: 30-01-2021 Accepted: 09-12-2021

DOI: <https://doi.org/10.4038/sljs.v40i1.8799>



created 1st webspace. The previously raised flap of the accessory digit was then used to cover the raw area over the retained thumb (line diagram). Then the excess volar skin of the accessory digit was excised (Figure 2).

Under tourniquet control, right 3rd webspace simple syndactyly release was done and the raw area was covered with full-thickness skin grafting. Full-thickness grafts were harvested from this excised skin and used to cover raw area created after syndactyly release of right 3rd webspace.

Tourniquet was released. Hemostasis was achieved. Cleaning and Dressing were done. Splintage was applied. The dressing was opened on day 2. The patient was discharged on 3rd day. The patient was on regular follow up and has regained normal thumb functions and there has been no redevelopment of 1st web space contracture even after 1 year of follow up. Parents were satisfied with the outcome.

### Discussion

First web space contractures unfavourably affect normal hand functions. They restrict the normal thumb opposition and abduction, thereby impairing all the pinches and grips [3]. The thumb accounts for about 40% to 50% of the hand's normal function, thus contractures of the first web space cause significant disabilities which have to be addressed at the earliest.

Webspace contractures are associated with thumb duplication, commonly with type 4 and 5 and less commonly with type 3 and 4. Traditionally, in thumb duplication with 1st web space contracture, z-plasty or a four flap z-plasty is usually performed. In some cases, a dorsal rotation flap or FTSG harvested from excised thumb is used [4]. The use of volar neurovascular island flap tunnel to webspace has also been described as a spare part technique [5]. However, the use of dorsal skin to augment 1st webspace has not been reported in the literature.

As the procedure is described, there is no incision over the volar side of the thumb, thus no functional or aesthetic deformity is present. Also, the incision lines camouflage with

the dark Indian skin over the dorsal aspect of the thumb, thus improving aesthetics. Also, there is no need for tunneling, thus improving flap viability.

Postoperative care is important to maintain the first web space after its release. After a healing period of 14 days, the splint was removed and the patient was started on physiotherapy. The patient could do near-normal thumb opposition and abduction. Local tissue transfer in such cases has been seen to be a good option for webspace deepening. It is important to choose the optimal configuration of the flap to reach dependable endpoints.

### Conclusion

We have described here a unique flap technique that uses the spare tissue of thumb polydactyly for resurfacing the released first web contracture, thereby providing coverage with a tissue that has good vascularity and also giving sensation to the resurfaced part.

All authors disclose no conflict of interest. The study was conducted in accordance with the ethical standards of the relevant institutional or national ethics committee and the Helsinki Declaration of 1975, as revised in 2000.

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### Learning Points:

- A careful preoperative assessment of the anatomy of the biliary tree as well as the gallbladder in patients going through pancreaticoduodenectomy.
- Adequate sampling of the gallbladder might be significant in recognizing early lesions in patients with extrahepatic cholangiocarcinomas; We might recommend that all gallbladders be resected along with the bile ducts for cholangiocarcinoma should be carefully inspected intraoperatively, and all suspicious lesions should undergo frozen section examination.