INTRODUCTION

Webs are special tissues. They fold and stretch and are elastic and thin. Common approaches to treat syndactyly of the hand include local flaps with skin grafts; however, challenges in the form of development of contractures and pigmentation remain, which occasionally necessitate additional surgeries. This report presents the treatment of a child with an “extra” web space due to polysyndactyly in all his limbs. In keeping with the principles of safer surgery, we transplanted webs for webs. To the best of our knowledge, there have been no web-for-web flaps documented in pediatric literature to date.

CASE REPORT

A 2-day-old boy was referred to this department due to polysyndactyly of both his hands and feet. His right hand showed duplicated distal phalanx of the thumb and syndactyly of the 4th and 5th fingers. (See Video 1 [online], which details the summary of the case. Preoperative images with radiographs and postoperative images of both hand and foot are shown.)

Syndactyly involved only the dermis and subcutaneous tissue. Similarly, the left hand also showed duplicated distal phalanx of the thumb and syndactyly of the 3rd and 4th fingers, involving the dermis and subcutaneous tissue (Fig. 1). The right foot showed medial and lateral row polysyndactyly. It had a thick and deviated 1st metatarsal bone, syndactyly of the 2nd and 3rd toes, and syndactyly of the 5th–6th–7th toes. The left foot showed a medial row polysyndactyly with a thick and deviated 1st metatarsal and syndactyly of the 2nd and 3rd toes.

To achieve function in both hands, treatment of syndactyly was a priority for this boy. Surgery was planned for after his first birthday. The duplication of both distal phalanges of the thumbs showed no cosmetic or functional issues; hence, no corrections were planned for these digits. Based on the alignment of the 1st/2nd toes of the right foot, it was decided to excise the 1st toe and the 7th toe and to split the 2nd and 3rd toes and the 5th and 6th toes. Similarly, for the left foot, we planned to excise the hallux and to split the 2nd and 3rd toes.

For the treatment of syndactyly of the hand, local flaps from skin grafts are the usual approach for treatment; however, this patient had an “extra” web space between the 1st and 2nd toes, which was acceptable for use in the reconstruction of an “absent” web space in the hand. After a careful explanation regarding the long surgeries and the possibility of a flap failure, the boy’s parents consented for web space transplantation. This could potentially provide a better outcome than the local flaps traditionally associated with skin grafts.

Summary: Syndactyly of the hand is commonly treated using local flaps with skin grafts; however, contractures and/or pigmentation pose a challenge, requiring repeated surgery. Here, we describe a case of a 1-year-old boy who underwent web transplantation for syndactyly. To the best of our knowledge, no “web for web” transplantations have been documented in pediatric literature. Because the patient had an “extra” web space, functional and aesthetic reconstruction was performed with careful preparation. The vascular pattern was assessed using high-resolution ultrasonography. The flap was harvested under a microscope, intravascular stenting was performed for secure anastomosis, and the adequacy of circulation in the flap was verified using the indocyanine green test. Each technique in the procedure used by us contributed to making the microsurgery safer. The present case suggests that “web for web” is a favorable treatment option for some cases, although these would be limited in number. (Plast Reconstr Surg Glob Open 2020;8:e3292; doi: 10.1097/GOX.0000000000003292; Published online 17 December 2020.)
Under general anesthesia and before surgery, the vascular patterns of the hands and feet were assessed using a high-resolution ultrasound device (XARIO 100 TUS-X100, Toshiba, Japan). While 1 team harvested the web flap under a microscope (OPMI Pentero, Carl Zeiss, Germany), the other team divided the syndactyly under another microscope to prepare the recipient vessels, and not to injure the digital nerve. Vascular supply was preserved by the opposite side of each finger. The web space between the right 1st/2nd toes was transplanted to the right 4th/5th finger syndactyly, followed by treatment of the 2nd/3rd toe syndactyly and 5th/6th toe syndactyly and resection of the 1st and 7th toes. (See Video 1 [online].)

The web space between the left 1st/2nd toes was transplanted to the left 3rd/4th finger syndactyly, followed by treatment of the 2nd/3rd toe syndactyly and resection of the hallux (Fig. 2). Syndactyly of the toes was treated using a plantar flap and a skin graft. Each web flap was microanastomosed to the digital artery and veins—1 artery and 2 veins. Diameter of the vessels was 0.7–0.9 mm. The operative times of the surgeries were 8 hours 8 minutes for the right hand and foot, and 7 hours 23 minutes for the left hand and foot. For secure anastomosis, the intravascular stenting (IVaS) technique was applied. Circulation in the flap was verified using the indocyanine green test. (See Video 2 [online], which details the circulation in the flap verified using the indocyanine test. After microanastomosis, circulation in the flap was verified using the indocyanine test.)

The 3-year postoperative photograph revealed excellent aesthetic and functional reconstruction of both the web spaces (Fig. 3). (See Video 2.) After microanastomosis, circulation in the flap was verified using the indocyanine test.) As there was minimal scarring, the web space remained elastic with no evidence of thinning, ulceration,
or pigmentation. The donor site underwent z-plasty of the scar due to a slight contracture, without any major complications. The family was satisfied with the aesthetic outcome, and the child achieved complete functional ability.

**DISCUSSION**

Webs have very special characteristics. They are elastic and thin and can stretch and fold. Web flaps are ideal for web space reconstruction of posttraumatic defects of the digits, as reported by Pinal et al. Because web transfer usually causes syndactyly of the donor digit, common treatments for syndactyly of the hand are local flaps with skin grafts; however, skin grafts lack subcutaneous tissue and softness, and the graft elasticity does not match that of the surrounding tissue. This becomes more marked as the patients grow (due to an insufficient expansion of the grafts when compared with the growing digits); hence, they often require additional skin grafts.

In this case, the patient had an “extra” flap, which is rare. As the “web for web” procedure shows a better outcome than the local skin flaps and skin grafts, we proposed this option to the patient’s family while aiming to minimize the risk of flap failure by ensuring careful preoperative preparation and assessment. Because the vessel pattern varies, as Hamada et al. and Hou et al. have reported, evaluation under color Doppler helped the surgeons to understand the anatomy and the pattern of the vessels. Flap elevations under a microscope helped identify even the smallest pedicle vessels. The IVaS technique helped preserve the lumen of the recipient and donor vessels, preventing injury to, or contact with, the back wall during anastomosis. Finally, assessment of the tissue circulation under indocyanine green test confirmed the flow at the anastomosis site and showed flap viability.

Although indications for “extra web” transfer are rare, and the patient and family should be well informed that the procedure demands long surgeries with general anesthesia, these results suggest that it would be a reasonable and ideal option in selected cases.

**SUMMARY**

This is a case report of a “web for web” transplantation, which, to the best of our knowledge, is the first of its kind in pediatrics. It shows excellent aesthetic and functional outcome and would be a reasonable and ideal option in selected cases.

Yoko Katsuragi Tomioka
Department of Plastic and Reconstructive Surgery
Graduate School of Medicine
The University of Tokyo
Hongo 7-3-1, Bunkyo-City
Tokyo 1130033
Japan
E-mail: yoko1031prs@gmail.com

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