Using Dermal Fat Graft to Release Complex Syndactyly: A New Method

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Sir,

The main purpose of syndactyly release is not only for cosmetic improvement but also to enhance hand function.1–3 Although normal functional digits require joint mobility and stability, some complex syndactyly release tends to result in joint immobility and instability.2,3 One of the reasons is congenital insufficient collateral ligaments.2 This report describes a new 2-stage surgical technique for complex syndactyly using a dermal fat graft. It is a new surgical option for reconstructing the collateral ligaments using a dermal fat graft.

A 2-year-old boy with complete syndactyly was referred to our department. The patient was delivered at 22 gestational weeks. The birth weight was 476 g. Microphthalmos, ankyloproctia, complete syndactyly of right third web space, and the moderate flexion contractures of middle and ring finger were noted in this child. Radiographs of right hand revealed accessory bone and complex syndactyly (Fig. 1). (See Video 1 [online], which displays preoperative photographs, preoperative radiographs, surgery, postoperative photographs, postoperative radiographs, and a postoperative movie in a 2-year-old infant treated for complex complete syndactyly.) The accessory bone was revealed between proximal phalanges of the index finger and metacarpophalangeal joint of the middle finger. Severe fused distal and middle phalanges of the middle and ring finger were revealed. Time-resolved magnetic resonance imaging (TRICKS) revealed no anomalies of the vascular bundles and isolated palmar digital arteries of the middle and ring finger.

After the indication for surgery was considered deliberately, an operation was carried out when the child was 3 years old. A midline linear vertical incision was designed on the volar and dorsal aspect to compromise circulation. A rectangular flap was made. The accessory bone was removed. The osteotomy on the distal and middle phalanges of the middle and ring finger were revealed. Time-resolved magnetic resonance imaging (TRICKS) revealed no anomalies of the vascular bundles and isolated palmar digital arteries of the middle and ring finger.

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Three months after the first operation, the second operation was performed. After the midline linear vertical skin incision from distal interphalangeal to metacarpophalangeal joint, the inserted dermis and scarred tissue replacing fat tissue was identified. The middle phalanges could be separated easily between the dermis and fat layer of the graft. The joint was not opened and there was no joint instability. Skin defects of second and third phalanges were covered with a full-thickness skin graft from the groin, and the rectangular flap was raised to create a webspace.

After a 6-months follow-up period (Fig. 2), the moderate flexion contracture of the middle and ring finger remained. The active range of motion and stability in the proximal interphalangeal and metacarpophalangeal joint was acceptable. The patient was able to grip something firmly.

In complex syndactyly release, joint instability can occur.2,4 The arthrodesis has been documented for joint instability.2,4 However, arthrodesis cannot help, leading to complete joint immobility and postponing the operation until the child reaches skeletal maturity.2,4

Fig. 1. Preoperative radiograph of the right hand of a 2-year-old infant. An accessory bone and complex syndactyly were recognized.

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In our method, the joint stability, mobility, and early syndactyly release were achieved by the dermal fat graft alternatively. Early syndactyly release can improve adequate growth and functionality of the finger.\textsuperscript{1,2,4} It can be one of the surgical options for treating the complex syndactyly.

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**DISCLOSURE**

The authors have no financial interest to declare in relation to the content of this article.

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**Fig. 2.** Radiograph of the right hand of the infant 2 months after the second syndactyly release. The middle and ring finger were completely separated.