



CASE REPORT

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Simple and easy reconstruction of nail matrix lesion using lateral finger flap after excision of digital mucous cyst

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ABSTRACT

We treated nine patients with skin defect produced by digital mucous cyst (DMC) excision on the finger and toe using lateral finger flap (LFF). The postoperative scars were esthetically acceptable and no recurrence of mucous cysts was observed. Our LFF is a simple method to repair minor distal dorsal finger defects.

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Introduction

The reconstruction of the distal dorsal fingers is difficult as the fingertip skin is hard and inflexible.[1–4] We have experienced cases of minor distal dorsal finger skin defects due to digital mucous cyst (DMC) excision. DMC is a common dorsal ganglion.[5] In addition, some studies on the operative procedures of digital dorsal finger reconstruction have also been conducted.[1–6] However, these methods cause long and visible scars [1–4] or are not suitable for the reconstruction of small defects. We felt a simpler and easier method was needed; thus, we decided to treat distal dorsal skin defects after DMC resection using lateral finger flap (LFF). This flap can be harvested under local anesthesia and our method can repair defects easily and simply after the resection of tumors of the nail matrix.

Patients and methods

From 2006 through 2014, we treated nine patients (five males and four females) with an average age of 59.5 years (52–70 years). Surgery was performed under digital nerve block using 1% lidocaine solution (AstraZeneca Japan, Osaka, Japan). The size of the skin defect was detected, the skin defect was measured and the LFF was designed at the volar side of the finger just below the mid-lateral line (Figure 1), and the

incision was made on the distal and dorsal side. The LFF was harvested with fat from the distal side and was transferred to the defect using 5-0 Ethilon suture (Ethicon, Baltimore, MD). The donor site was closed directly, also by using 5-0 Ethilon suture.

Results

All of our cases had skin defects after mucous cyst excision. The skin defects were located as follows: on the thumb in one case; the middle finger in three cases; the ring finger in two cases; the little finger in two cases and the third toe in one case (Table 1). The average flap width was 5.9 ± 0.9 mm (range 5–7 mm). Although three patients had paresthesia of the finger for one month postoperatively, there was no flap necrosis, infection or hematoma. No recurrence of tumors was observed. The scars and dog ear deformities were considered esthetically acceptable. In three cases, small trap-door deformity was observed. However, all patients were satisfied with their results.

Case report

Case 1: 70-year-old female

The patient had noticed a tumor on the right middle finger. She was referred to our department because the tumor had been increasing in size and her nail



Figure 1. (a) Flap design: the flap was designed just below the mid-lateral line. (b) The flap was elevated from the proximal side of the finger and harvested with fat (solid line). (c) The flap was fixed using surgical nylon. The flap donor site was closed directly.

Table 1. Patient profiles.

Case	Age	Sex	Location of tumor	Flap width (mm)	Follow-up (years)
1	70	M	Left middle finger	5	7
2	65	F	Right right finger	6	3
3	70	F	Right middle finger	5	5
4	62	F	Left small finger	5	6
5	59	M	Left ring finger	7	5
6	58	F	Right middle finger	7	3
7	66	M	Right small finger	6	2
8	52	M	Right 3rd toe	5	2
9	60	M	Right thumb	7	1

showed grooving deformity. We performed tumor resection and LFF transfer under digital nerve block (Figure 2a and b). The flap was elevated from the distal and dorsal side and fixed to the defect (Figure 2c). Three years postoperatively, no tumor recurrence was observed and the dog ear deformity was considered to be esthetically acceptable. Small trap-door deformity is still left. However, patient is satisfied with the result (Figure 2d).

Case 2: 65-year-old male

The patient had noticed a tumor on the right ring finger. Although she received liquid nitrogen treatment for six months in other clinic, the tumor recurred. She was then referred to our department (Figure 3a). We performed tumor resection and reconstruction under digital nerve block. The tumor was excised and then flap was harvested (Figure 3b). LFF was fixed to the defect (Figure 3c). Three years postoperative, she had no tumor recurrence. Postoperative scars are acceptable (Figure 3d).

Discussion

Various reconstructive methods of fingertip have been reported.[1–4] The bipedicle flap transfer or rotation flap combined with skin grafting was also reported for the nail fold reconstruction [1] and the reconstruction of distal dorsal finger defects after trauma or tumor resection was performed using digital artery island flap.[2] These methods are useful techniques for the reconstruction of large defects. However, we sometimes

experience not only minor but also full-thickness defects of distal dorsal lesions that have been caused by DMC excision. We therefore felt the need for a simple and easy reconstruction method.

DMC is a common cyst that arises from the distal interphalangeal joint.[5] There are some reconstructive procedures performed following DMC resection. Constant et al. reported successful reconstruction using skin grafting.[5] Furthermore, in 1972, Kleinert et al. reported a reconstructive procedure using rotation flap [3] which was designed at the dorsal side of the finger, and has since commonly performed. The flap was easy to harvest; however, a large flap was required even if the tumor was small. Additionally, a long visible scar typically remained because of the flap size and location. To avoid harvesting a large flap, Imran et al. used a rhomboid flap to reconstruct skin defects after DMC resection.[4] Harvesting the flap in their procedure was also easy. However, the flap size was limited because the donor site of this flap was the groove of the distal interphalangeal joint. LFF can reconstruct larger defects than Imran et al.'s procedure.

The digital artery perforator flap transfer is a useful technique for the reconstruction of fingertip by Koshima et al.[6] Our flap is based on their flap. However, different from their procedure, LFF is not required to dissect digital artery perforator. They demonstrated a rich vascular network which was observed at subcutaneous tissue of the pulp [6] and Hauck et al. also reported this rich vascular network.[7] Our LFF includes this rich pulp vasculature.

Recently, some authors have reported that osteophyte is an important step in treating DMC.[1,8] On the other hand, Kasdan et al. [9] have suggested that aggressive osteophyctomy causes a decreased range of movement of the distal phalangeal joint. Moreover, Kanaya et al. reported the successful treatment of DMC without osteophyctomy.[10] Instead of excising the cyst, they performed total dorsal capsulectomy.

DMC treatments without capsulectomy or osteophyctomy have been also reported.[5,11] Constant et al. reported the surgical results of skin grafting.[5] In their

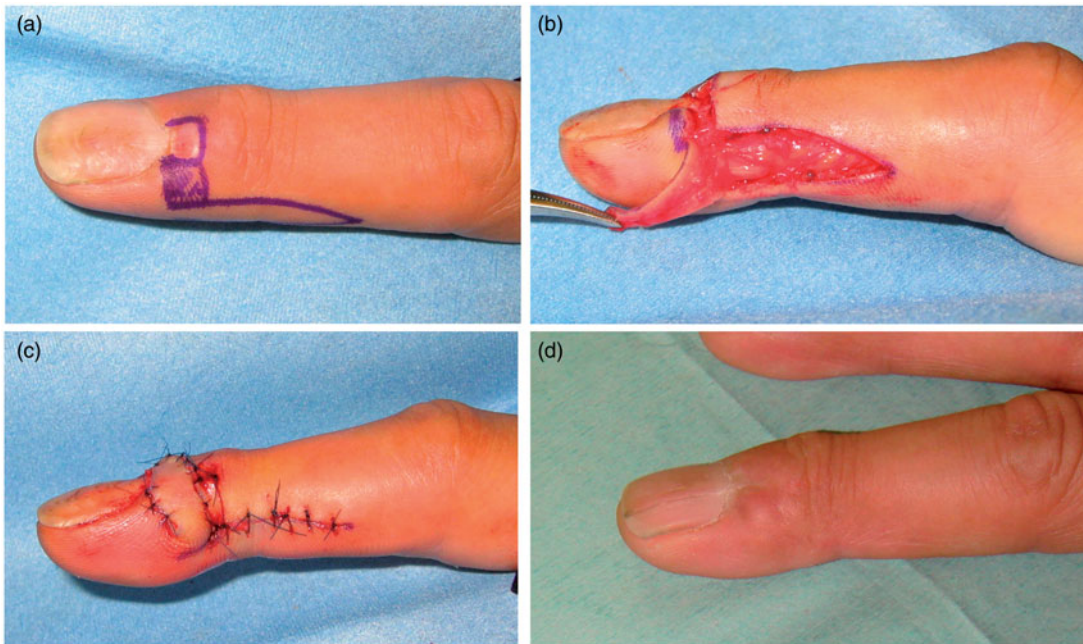


Figure 2. (a) Nail grooving deformity was observed. Design of tumor excision and flap. (b) View of flap elevation. The flap was harvested with fat. (c) View of flap fixation. (d) Three years postoperatively, tumor recurrence was not observed.



Figure 3. (a) Nail grooving deformity was observed in the right ring finger. (b) View of flap elevation. The flap was harvested with fat. (c) View of flap fixation. (d) Three years postoperatively, tumor recurrence was not observed.

study, 25% of patients who had received primary closure showed tumor recurrence, whereas only 3% of the skin grafting group showed tumor recurrence. Furthermore, Johnson et al. reported tumor recurrence in only 1.4% of their patients.[11] In our study, to

prevent damage of distal phalangeal joints, we only performed cystectomy; however, no patients in the present study experienced tumor recurrence, even after long-term follow-up. We believe further study is required to confirm our findings.

The LFF is useful for the reconstruction of skin defects of nail matrix lesions. The donor-site scar of LFF is linear and simple, and the scar of the pulp side as well as dog ear deformity is considered esthetically acceptable. Our results suggest that LFF is an easy and useful procedure for reconstructing defects after DMC excision.

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Disclosure statement

The authors declare that there is no conflict of interest regarding the publication of this paper.

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