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Omentum as gliding material after extensive forearm tenolysis

K. Ueda, T. Harashina, T. Harada, S. Oba and S. Nagasaka

Department of Plastic and Reconstructive Surgery, Saitama Medical Center, Saitama Medical School, Japan

SUMMARY. **Tendon adhesion occurring after major replantation can be severe and extensive due to the nature of the trauma, ischaemia, prolonged oedema and/or infection. Therefore there is a high possibility of re-adhesion after tenolysis. In two cases of tenolysis after forearm replantation omentum was used as gliding material and good results were obtained.**

Tendon adhesion occurring after major replantation can be severe and extensive due to the nature of trauma, ischaemia, prolonged oedema and/or infection. Therefore there is a high possibility of re-adhesion after tenolysis and the use of some tendon gliding material is mandatory. There have been several reports of using tendon gliding materials with their own blood supply.[1–6]

In cases of forearm replantation, the area to be covered with gliding material will be wide and availability of such reconstructive materials may be limited.

In two cases of tenolysis after forearm replantation we have used omentum as gliding material and good results were obtained.

Case reports

Case 1

A 23-year-old factory worker whose right wrist was crushed in a press and totally amputated had a distal stump relatively cleanly cut, but the proximal end was crushed. Immediate replantation was performed. In the distal stump, minimal debridement was performed and all carpal bones in the proximal stump were removed. The radial and ulnar artery and two dorsal cutaneous veins were anastomosed. The ulnar arterial anastomosis and one of the venous anastomoses needed vein grafts. Each of the flexor digitorum profundus tendons was repaired and the extensor digitorum tendons were repaired together. No efforts were made to repair nerves because of extensive nerve defects and lack of operating time.

Marked oedema persisted postoperatively and wound infection continued for a long period. Consequently the resultant range of motion was extremely poor and pinch and grip were impossible. Rehabilitation using a dynamic splint was continued for 6 months but manifest improvement was not obtained.

Tenolysis was performed, freeing the flexor pollicis longus and flexor digitorum profundus tendon and the flexor digitorum superficialis tendons were removed. Dorsally, the extensor pollicis longus and extensor digitorum tendons were dissected out (Fig. 1).

An omental flap was raised containing the left and middle omental arteries. The dominant right gastroepiploic vessels were chosen as the vascular pedicle. The omental flap was spread below and above the tenolysed tendons of the palmar and dorsal sides. The pedicle artery was anastomosed end-to-side to the radial artery and the vein to the cephalic vein in the same way. Meshed skin graft was applied over the revascularised flap (Figs 2, 3).

The result 2 years and 7 months after tenolysis is shown (Figs 4, 5). Compared with the preoperative state, the range of motion of the fingers has clearly improved (Table 1).

Nerve grafting is being planned at another institution.

Case 2

A 45-year-old factory worker had his right forearm crushed and incompletely amputated, the injured stumps being severely crushed with only the median nerve, cephalic vein and a small skin bridge being left intact.

Revascularisation and repair of ulnar nerve, muscles and tendons were successful and rehabilitation using a dynamic splint was continued for 7 months. Improvement of the range of motion was not adequate, so tenolysis was performed.

The adherent muscle groups were freed, an omental flap was harvested and transplanted to the defect and covered by meshed skin graft as in case 1 (Figs 6, 7).

The operated hand 9 months after tenolysis is shown (Figs 8, 9). Compared with the preoperative state, the functional range of motion of the fingers 9 months after tenolysis has clearly improved (Table 2). The two point discrimination in the median nerve area is 10 mm. The patient can hold a pencil and is satisfied with the result.

Discussion

A temporoparietal fascial flap is often used as gliding material for reconstruction after degloving injuries.[1–3,5] By combining temporal fascia with temporoparietal fascia the area to be covered can be widened.[6] Use of a scapular fascial flap for the same purpose has also been reported.[4]

In the forearm, four layers of gliding material between tendons and bones and between tendons and skin on both the extensor and flexor side are necessary.

Therefore a gliding material which is adequately wide, thin, pliable and rich in vascularity is necessary. Fascial flaps are suitable in some respects but their size is limited. We believe that omentum is an ideal donor

Fig. 1

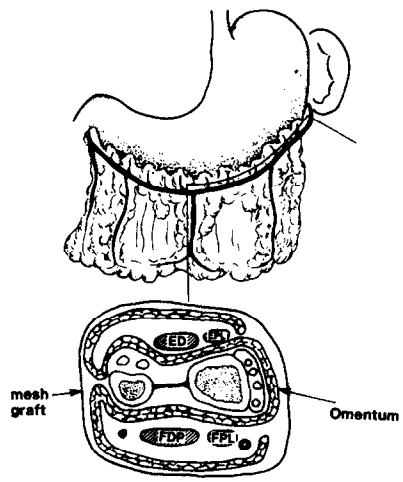

Fig. 2

Fig. 3

Fig. 4

Fig. 5

Figure 1—*Case 1.* At the time of tenolysis. **Figure 2**—Diagram of the omental wrapping. **Figure 3**—Freed tendons were wrapped with revascularised omentum, which was covered with mesh skin graft. **Figure 4**—At 2 years, extension, maximal. **Figure 5**—At 2 years, flexion, maximal.

Table 1 Pre- and postoperative range of motion in case 1

	Total active range	
	Preoperatively	*Postoperatively*
Index	79°	133°
Middle	52°	152°
Ring	99°	123°
Little	89°	119°

Table 2 Pre- and postoperative range of motion in case 2

	Total active range	
	Preoperatively	*Postoperatively*
Index	42°	115°
Middle	46°	126°
Ring	51°	122°
Little	33°	92°

site when the area to be covered is extensive because it is large, thin and rich in vascularity.

As far as we know, there is no report of using omentum as gliding material. There was a report[7] of omentum having been used to cover the released median nerve in carpal tunnel syndrome but one could criticise that on the grounds that a fascial flap is quite adequate for that purpose.

We have often used omentum for scalp and chest wall reconstruction and noted considerable volume

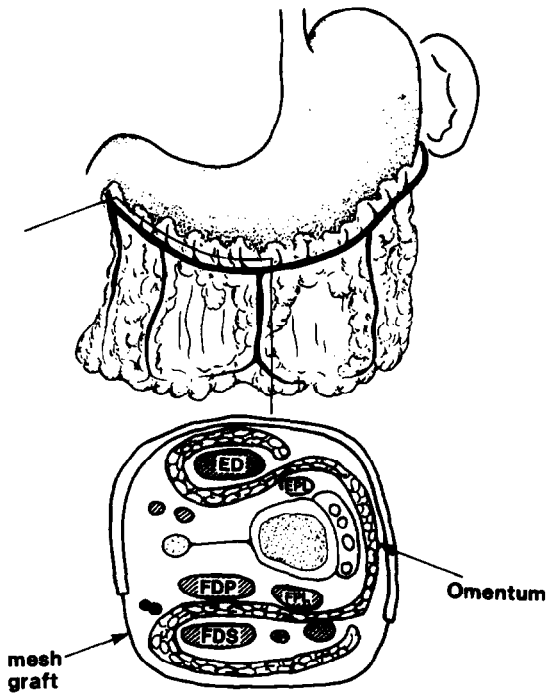

Fig. 6

Fig. 7

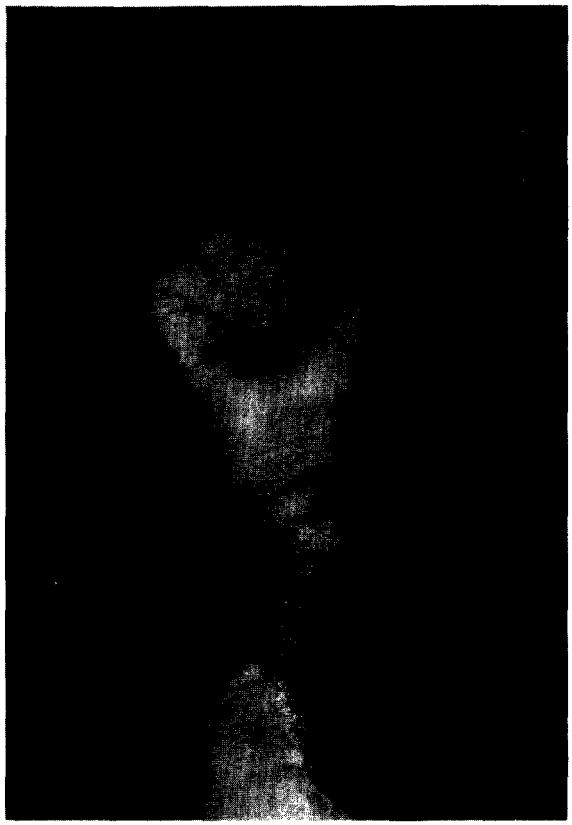

Fig. 8

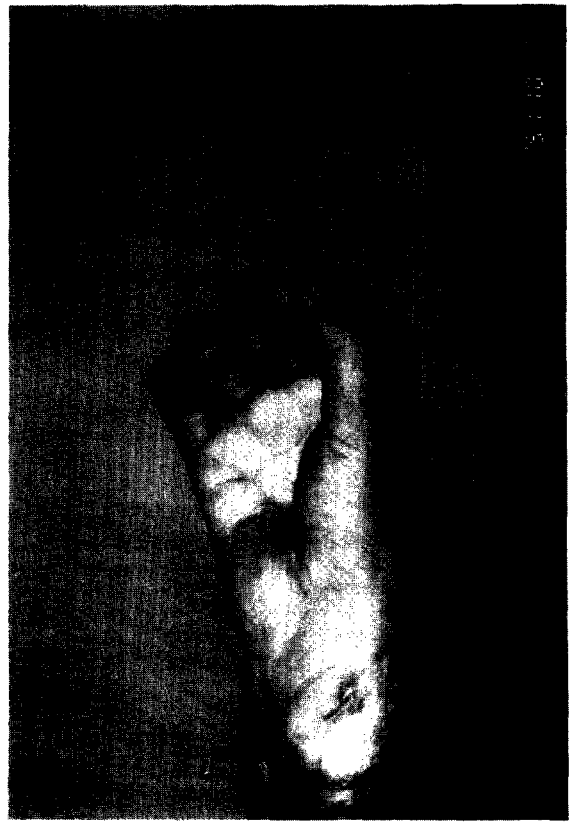

Fig. 9

Figure 6—*Case 2.* Diagram of the omental wrapping. **Figure 7**—The omental flap spread below the flexor and extensor group of the tenolysed tendons and muscles and folded over them with mesh skin graft applied. **Figure 8**—At 9 months, extension, maximal. **Figure 9**—At 9 months, flexion, maximal.

reduction after operation. Therefore in case 1, we left the volume overcorrected but atrophy did not occur. Therefore in case 2, we used a more correct volume of omentum and a better contour was obtained.

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The Authors

Koichi Ueda, MD, Instructor.
Takao Harashina, MD, Professor.
Teruichi Harada, MD, Instructor.
Shinichiro Oba, MD, Resident.
Shozo Nagasaka, MD, Resident.

Department of Plastic and Reconstructive Surgery, Saitama Medical Center, Saitama Medical School Tsujido, Kamoda, Kawagoe, Saitama, 350 Japan.

Requests for reprints to: Dr Ueda, Department of Plastic and Reconstructive Surgery, Osaka Medical College, Daigakucho, Takatsuki City, Osaka, 569, Japan.

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