

Long Term Evaluation of Omental Transposition for Chronic Lymphedema

HARRY S. GOLDSMITH, M.D.

A series of patients treated with omental transposition for chronic lymphedema of an extremity is presented. Several surgical steps in the procedure are stressed and the results and complications of the operation listed. The major drawback of the procedure is that the peritoneal cavity must be entered. Success following omental transposition can be expected in approximately one-third to one-half of patients.

A REPORT published in 1966 described the use of the intact omentum for treating patients with chronic lymphedema of an extremity.⁴ Transposition of the omentum for this condition was based on the hypothesis that discontinuity of lymphatic and lymphovenous systems within the lymphedematous extremity would be bridged by lymphatic and vascular structures in the omentum.

The purpose of this paper is to report the long-term results of omental transposition and changes in surgical technique that have evolved from continuing experience with the operation.

Surgical Technique

Early reports on omental transposition showed that the structure could be lengthened to the elbow or knee by simply dividing omental attachments to the transverse colon and from a major portion of the greater curvature of the stomach.³ Further anatomical and surgical experience with the omentum now allows the structure to be elongated to practically any area of the body by dividing it in relation to its vascular architecture (Fig. 1).¹ Several technical steps in the operation have been altered over the years. These changes and several other points in the procedure are listed below.

1. A midline incision is adequate for elongating the omentum; an upper incision for the arm and a mid to lower incision for the leg.

2. The anterior layer of the gastrocolic omentum is occasionally fused to the transverse mesocolon. When it is

*From Jefferson Medical College,
1025 Walnut Street, Philadelphia,
Pennsylvania 19107*

necessary to separate these two structures, care must be taken to prevent damage to the middle colic vessels within the transverse mesocolon.

3. When the omentum is freed from attachments in the left upper quadrant, it is advisable to place two clamps on any sizable blood vessel in the area, since slippage of a single clamp or the loosening of a knot below a single clamp during the process of tying, can result in the retraction of a bleeding vessel high into the left upper quadrant. This occurred once to the author early in the series and is an event well remembered.

4. The surgical technique used in early cases of omental transposition to the leg allowed for the omentum to be brought out of the peritoneal cavity through a small retroperitoneal opening overlying the iliac vessels. From this opening, a tunnel was created anterior to the femoral vessels, which required division of the inguinal ligament. The omentum was carried through this tunnel and subsequently draped as an omental apron over the underlying muscles of the leg. This technique has been changed to that used for omental transposition to the arm whereby the omentum is simply brought out of the abdominal cavity at the end of the abdominal incision and placed subcutaneous into the involved limb. This simplifies the operation and eliminates the chance of developing an inguinal hernia.

5. That part of the lengthened omentum which remains within the abdominal cavity must be secured so as to minimize the chance of developing an internal hernia. It is important to remember when fixing the intraperitoneal portion of the omental pedicle that the needle not impinge upon the artery or vein in the omental pedicle since it is these vessels which supply and drain the vascular system of the lengthened omentum.

6. All suture material used in a lymphedematous ex-

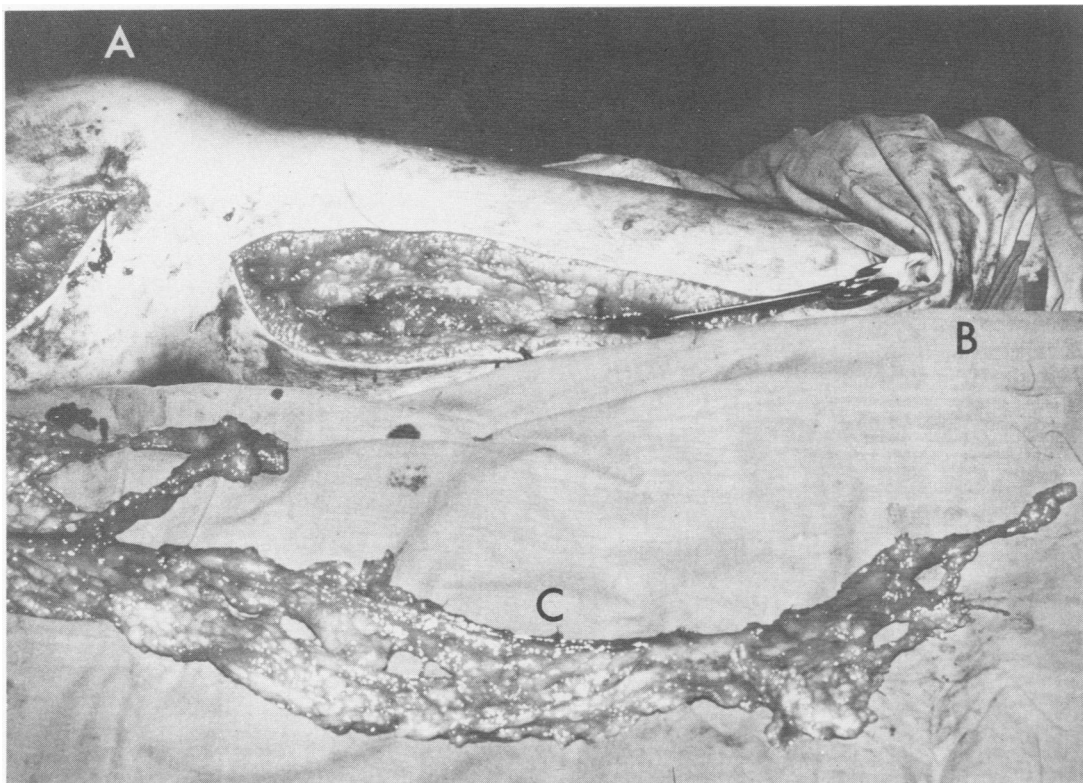


FIG. 1. Pedicled omentum prior to being placed in median tunnels along thigh and lower leg (A. knee, B. ankle, C. intact omentum).

tremity should be absorbable except for the skin sutures. If non-absorbable sutures are used and a wound infection occurs, the continued presence of the foreign material in lymph fluid can lead to a persistent problem.

7. All incisions in a lymphedematous extremity must be closed with great care, for if the wound separates, regardless of how small the separation, lymph fluid can drain through the opening for a long period. To obviate this potential problem, multiple small sutures are used to approximate both the subcutaneous and cutaneous layers of the skin. Skin sutures are usually left in place for a longer period of time than is customary with other types of operations.

Results

There were 22 patients in this series; 13 with lymphedema of the leg and 9 of the arm. Only patients who have had a followup period of at least one year were included in this series. The longest followup period is over seven years.

Results of the operation are based on objective criteria listed in Table 1. A clinical result was considered good if at

TABLE 1. *Objective Criteria*

- | |
|--|
| 1. Diminution in size of involved extremity. |
| 2. Diminution or disappearance of attacks of lymphangitis and cellulitis of lymphedematous limb. |
| 3. Increased function of the involved extremity. |
| 4. Marked decrease in the tissue turgor of the lymphedematous limb. |

least one of the criteria listed in Table 1 occurred in addition to the patient's favorable evaluation of his postoperative response. If one or more criterion listed in Table 1 occurred, but the patient did not believe that his operation had been worthwhile, the result of the procedure was listed as poor. Table 2 shows the operative results.

Complications of omental transposition are listed in Table 3. The patient (C.G.) with upper intestinal obstruction and patient (R.W.) who had a pulmonary embolus and a stress ulcer, developed their complications shortly after being discharged from the hospital. C.G. not only had a severe complication, but was doubly unfortunate in that she had no response to omental transposition. The patient (R.W.) who is now more than seven years after omental transposition, has continued to consider her operation worthwhile in spite of its complications.

The most devastating long-range postoperative complication was in a teenage male who, three and one-half years after surgery, considered the results of his operation to be excellent; an evaluation shared by his family and this

TABLE 2. *Operative Results: Omental Transposition*

Leg		Arm	
(1-7 year followup)		(3-7 year followup)	
13 Patients		9 Patients	
Results	Good—5 (38%)	Results	Good—5 (56%)
	Fair—3 (23%)		Fair—1 (11%)
	Poor—5 (38%)		Poor—3 (33%)

TABLE 3. *Complications*

Omentum to Leg	Omentum to Arm
M.J.—Inguinal hernia	F.L.—Wound separation
A.K.—Spigelian hernia	J.B.—Wound infection
G.P.—Wound infection	C.G.—Upper intestinal obstruction
R.W.—Pulmonary embolus and stress ulcer	
D.C.—Adhesions causing small bowel gangrene and death (3½ yrs. P.O.)	

surgeon. One day at school he developed abdominal pain while eating a frankfurter. Because of this unfortunate setting surrounding the advent of his abdominal discomfort, he was treated for food poisoning for four days. He subsequently died at home and was found at autopsy to have had a loop of gangrenous bowel secondary to a postoperative adhesion.

Discussion

Transposing the omentum for chronic lymphedema of an extremity was based on the concept that omental lymphatics would re-establish lymphatic flow across the area of lymphatic interruption. Clinical success with this operation by the author and others,^{2,6} including published lymphangiograms demonstrating lymphatic reestablishment,^{2,6} has confirmed the reasoning behind the procedure. The question now is whether clinical results of omental transposition justify its continued performance.

Since I do not believe omental transposition is a difficult operation to perform and because many, if not most, of the potential surgical problems inherent in the procedure have been worked out, I plan to continue to perform the operation when indicated, especially in patients with chronic lymphangitis since the operation has been most impressive in correcting this problem. However, I have been impressed with favorable reports of simpler operations for chronic lymphedema such as the Thompson operation of a buried dermal flap,⁷ and the subcutaneous excision of lymphedematous tissue.⁵ If I were asked to recommend an operation for chronic lymphedema by a surgeon with no experience in transposing the omentum, I would be inclined to suggest that one of the above two procedures be performed, since neither operation violates the peritoneal cavity as does omental transposition. If the initial opera-

tion for chronic lymphedema proved ineffective, omental transposition could be performed at a later date with the knowledge that a reasonable number of patients might be expected to have a satisfactory response.

The large number of operations devised for improving lymphatic drainage from a chronically lymphedematous limb indicates the lack of a surgical procedure which is consistently effective. Because of the relative rarity of chronic lymphedema, only a few surgeons have been able to develop a sizeable clinical experience with the problem. This has meant that the majority of surgeons who see only an occasional patient with chronic lymphedema, usually must rely upon the reports of others in deciding the best operation to offer their patient. Unfortunately, even surgeons with a relatively large experience with chronic lymphedema don't have enough patients or the inclination to carry out a controlled clinical experiment. This results in the surgeon championing the operation found most effective in his hands without his ever developing sufficient experience with other procedures to test their clinical effectiveness or to learn the operative techniques necessary to minimize their post-operative complications. The author has performed only omental transposition for chronic lymphedema and therefore must accept this criticism. A carefully controlled clinical study which allows objective evaluation by unbiased observers of long-term results of various surgical procedures for chronic lymphedema is truly needed.

References

1. Alday, E. S. and Goldsmith, H.S.: Surgical Technique for Omental Lengthening based on Arterial Anatomy. *Surg. Gynecol. Obstet.*, **135**:103, 1972.
2. Dale, W. A.: The Swollen Leg. *Curr. Probl. Surg.*, Yearbook Medical Publishers, September, 1973.
3. Goldsmith, H. S., De Los Santos, R. and Beattie, E. J., Jr.: The Relief of Chronic Lymphedema by Omental Transposition. *Ann Surg.*, **166**:573, 1967.
4. Goldsmith, H. S. and De Los Santos, R.: Omental Transposition for the Treatment of Chronic Lymphedema. *Rev. Surg.*, **23**:303, 1966.
5. Miller, T. A., Harper, J. and Longmire, W. P. Jr.: The Management of Lymphedema by Staged Subcutaneous Excision. *Surg. Gynecol. Obstet.*, **136**:586, 1973.
6. Rigas, A., Chrysanthakopoulos, S. and Tsardakas, E.: Diagnostic and Therapeutic Applications of Lymphangiography in Clinical Medicine. *Am. J. Surg.*, **120**:66, 1970.
7. Thompson, N.: The Surgical Treatment of Chronic Lymphoedema of the Extremities. *Surg. Clin. N.Am.*, **47**:445, 1967.