RESEARCH LETTER

Dynamic Parietal Closure: Initial Experience of an Original Parietal Closure Procedure for Treatment of Abdominal Wound Dehiscence

Abdominal wound dehiscence complicates between 0.2% and 10% of midline laparotomies[1] and is associated with significant morbidity and mortality (44% and 67%, respectively).[2,3] The surgeons who perform digestive surgery and plastic surgery at our institution have considered how to treat abdominal wound dehiscence. Given that preoperative risk factors cannot be modified in an emergency setting,[1,2] we added some specific plastic surgery procedures to the conventional parietal closure technique. We thus developed a "dynamic parietal closure" technique in which silicone loop sutures are used to strengthen a conventional aponeurotic closure. The procedure is simple, quick, inexpensive, and compatible with digestive stomas and complex peritoneal drainage. It has the advantages but not the disadvantages of the use of retention sutures or abdominal wall plastic surgery.[4]

Video available online at www.archsurg.com

Methods. Before dynamic parietal closure for the treatment of abdominal wound dehiscence is performed (video, http://www.archsurg.com), if any drains are in place, then externalization of the stoma(s), bowel replacement, and parietal disinfection are performed as usual.

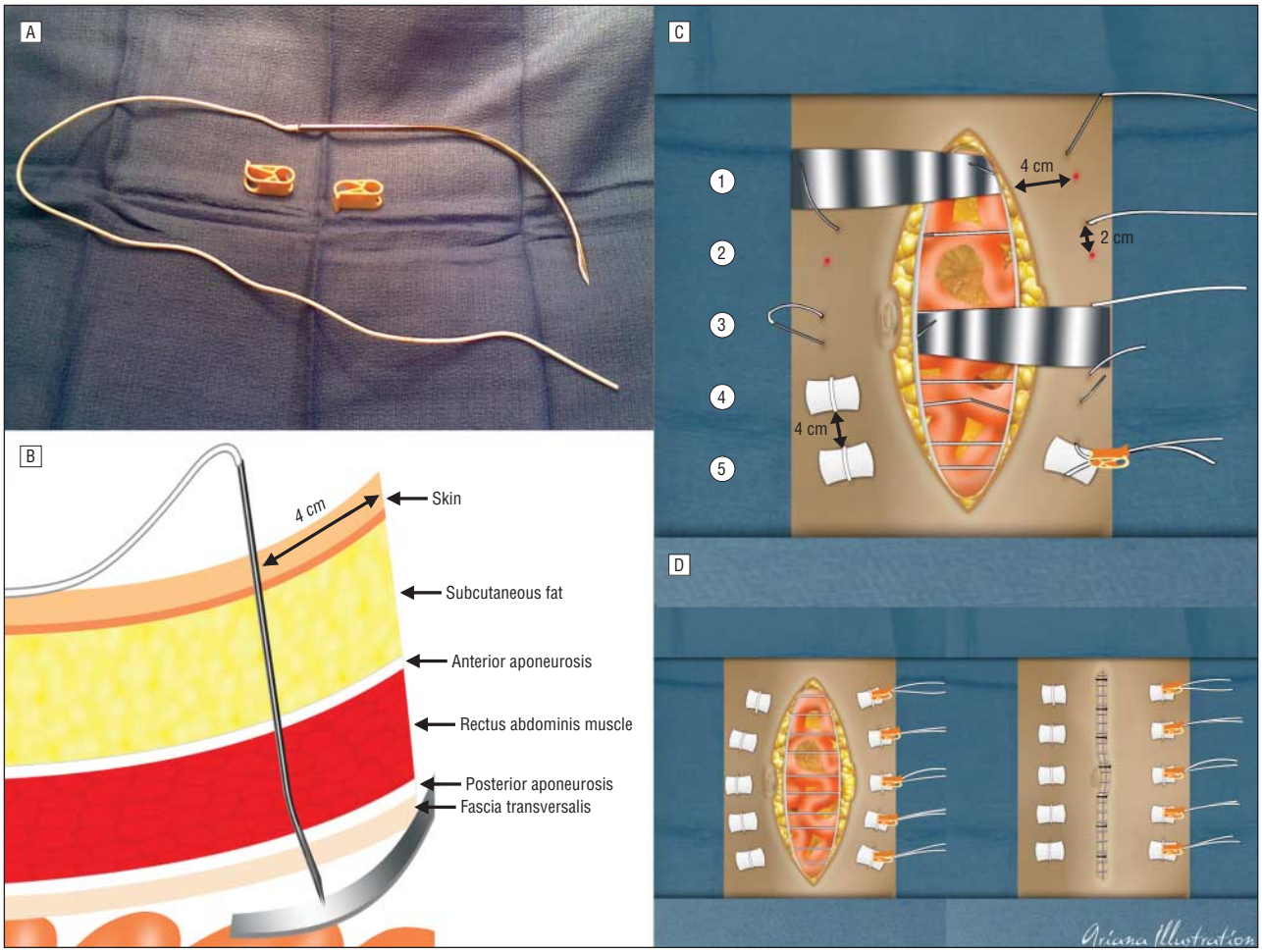

Figure. A, Elastic silicone loop screwed on the noncutting end of a needle (the locking system is yellow). B, The needle was passed transfascially across the wound 4 cm from the edge. The bowel was protected by a malleable blade. C, Description of the operative technique in 5 steps: (1) the needle was inserted 4 cm back from the wound edge on the right; (2) the needle was inserted on the wound edge on the left; (3) the needle was inserted again on the wound edge on the left (2 cm apart); (4) the needle was inserted at the initial wound edge, and a U-shaped suture was obtained; and (5) the system was maintained with the locking system, and compresses protected the skin. D, Once the system was in order, tension was adjusted to close the abdominal wall.

Table. Preoperative, Operative, and Postoperative Data on 16 Patients Who Underwent a Dynamic Parietal Closure Procedure

Data	Value
Before the procedure, median (range)	
Age, y	75 (25-88)
ASA score	3 (2-4)
French Society of Surgery score	2 (1-3)
BMI	26.2 (17.1-40.0)
Albumin, g/dL	23.8 (14.2-47.0)
Creatinine clearance, mL/min/1.73 m^2	51 (30-122)
Webster score	13 (2-26)
Mäkela score	2 (0-3)
Grade IIIb morbidity rate[a]	100.0
During the procedure, median (range)	
Operating time, min	60 (40-300)
U-shaped sutures, No.	6 (4-7)
After the procedure	
Overall postoperative morbidity rate[a]	1.5
Clavien scoring system, No. (%) of patients	
Grade 0	5 (31.3)
Grade I	1 (6.3)
Grade II	6 (37.5)
Grade IIIa	2 (12.5)
Grade IIIb	0 (0.0)
Grade IVa	2 (12.5)
Grade IVb	0 (0.0)
ICU stay, median (range), d	0 (0-16)
Hospital stay, median (range), d	18 (6-54)
Midline incisional hernia rate	25.0
Follow-up period, median (range), d	154 (17-377)

Abbreviations: ASA, American Society of Anesthesiologists; BMI, body mass index (calculated as weight in kilograms divided by height in meters squared); ICU, intensive care unit.

SI conversion factors: To convert albumin to grams per liter, multiply by 10; and to convert creatinine clearance to milliliters per second per meter squared, multiply by 0.0167.

[a] Using the Clavien scoring system for surgical complication: 0, no complication; I, deviation from normal postoperative course with no criteria for II, III, or IV; II, etiologic pharmacologic treatment; IIIa, interventional procedure without general anesthesia; IIIb, interventional procedure with general anesthesia; IVa, single-organ dysfunction requiring intensive care; and IVb, multiorgan dysfunction requiring intensive care.

At the time of parietal closure, successive mass closures were performed along the entire length of the median laparotomy with elastic silicone loops (45 cm in length and 2 mm in diameter [Ethiloop; Ethicon, Somerville, New Jersey]). Each loop was screwed onto the proximal end of a needle (as in drain externalization) and was placed transfascially across the wound to obtain a U-shaped suture every 4 cm.

Once the dynamic parietal closure technique has been performed along the entire length of the laparotomy, we adjusted the tension. This pushed back the digestive tract and closed the aponeurotic edges to yield a tension-free suture. The locking system comes from the Gripper Plus safety needle (Smith Medical, Brisbane, Australia).

We used a continuous, aponeurotic suture (PDS; Ethicon, Somerville, New Jersey).[5] The skin was closed conventionally. Lastly, the dynamic parietal closure's tension was adjusted, and compresses were placed between the skin and the loops (**Figure**).

The surgical site was examined every 48 hours, and the elastomer tension was adjusted so that constant force was applied. Abdominal dressings were positioned and changed conventionally until the laparotomy was dry. Abscesses were treated conventionally (vacuum therapy was feasible, if required). The surgeon removed the system 21 days later in the consultation room (by cutting and then pulling out the elastomer loops).

Results. We performed a prospective study of 873 consecutive patients who underwent a midline laparotomy during the period from January 2009 to December 2010. The overall incidence rate for abdominal wound dehiscence (diagnosed clinically within 2 weeks of the operation) was 2.06% (n=18), with incidence rates of emergency and planned abdominal wound dehiscence of 2.23% and 1.19%, respectively. In all cases of abdominal wound dehiscence, we performed an emergency procedure to redo the midline laparotomy, examine the abdominal cavity (to check for infection), and then perform the dynamic parietal closure technique. Two patients were excluded because they died in the hospital 18 and 20 days after surgery, respectively (mortality rate, 11.1%). Prospectively, we analyzed the data for 16 patients. The median Webster and Mäkela scores were 13 (range, 2-26) and 2 (range, 0-3), respectively. The etiology of abdominal wound dehiscence was mechanical in 12 patients and septic in 4 patients. The abdominal wound dehiscence recurrence rate was 0%. Specific and overall morbidity and mortality rates are shown in the **Table**. The midline incisional hernia rate was 25% (diagnosed clinically or on the basis of a computed tomographic scan) according to the medical literature criteria.[3] The median follow-up period was 157 days. Material costs never exceeded $27 per patient.

Comment. Dynamic parietal closure is an original, easy, inexpensive, and efficient procedure. It must be evaluated with larger numbers of patients. In individuals with a very high risk of abdominal wound dehiscence, the dynamic parietal closure technique could perhaps be performed preventively.

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Online-Only Material: The video is available at http://www.archsurg.com.

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COMMENTS AND OPINIONS

"Unnecessary" Postmastectomy Radiation Therapy

I read with great interest the review by Christante et al[1] and the thoughtful consideration of their work by Beatty.[2] Dr Beatty notes that more than half of the patients in the Christante et al group did not have a tumor size greater than 5 cm, nor did they have 4 or more positive nodes. On this basis, Beatty suggests that we should decrease "unnecessary" postmastectomy radiation therapy. I challenge their definition of "unnecessary" postmastectomy radiation therapy, which they received from the American Society of Clinical Oncology guidelines formulated in 2001. Both Christante et al and Beatty consider this to be the best approach.

The decision to administer postmastectomy radiotherapy is a complicated one. Recent literature has shown that T3N0 (>5 cm in size), which has long been an accepted indication for postmastectomy radiation therapy, is no longer considered to be appropriate in isolation.[3-6] Data from McCammon et al[5] support very high rates of recurrence of cancer after a mastectomy (40%) in premenopausal node-negative women with close surgical margins and lymphovascular invasion, despite small tumor size.[7-9] The 1 to 3 positive-node cohort in the early breast cancer trialist group's analysis showed an absolute decrease in the local recurrence rate of 11.6% and an absolute survival rate of 4.4% with radiotherapy.[10] The concept of nodal ratio identifies the highest risk among the 1 to 3 positive-node subgroup.[11,12] Molecular profiling into luminal A, luminal B, human epidermal growth factor receptor 2–enriched, and basal subtypes is also predictive of locoregional failure.[13,14] This information is likely to influence postmastectomy radiotherapy administration as the science evolves.

The dictum that either a tumor size greater than 5 cm or the presence of 4 or more positive nodes is an indication for postmastectomy radiation therapy is no longer valid. The National Comprehensive Cancer Network guidelines recognize this and give a "strongly considered" recommendation for postmastectomy radiation if the patient has 1 to 3 positive nodes.[15] The survival benefit conferred by radiation when local recurrence is prevented[10] demands that we critically evaluate the literature and offer radiotherapy appropriately, as our first priority, to prevent deaths due to breast cancer.

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