not known. However, 16 of the 126 (16%) patients who underwent bilateral ITA grafting were diabetic; 53 (42%) had moderate obesity ($25 < \text{body mass index} \leq 30$) and 22 (17%) had morbid obesity ($\text{body mass index} > 30$); and 14 (11%) were older than 70 years. Applying the criteria currently in use in the Saint Joseph Hospital, 36 patients would have been excluded from bilateral ITA grafting and five of 11 DSWIs would have been avoided. Further studies, as recently exemplified by He and associates,² are warranted to better define the population that would benefit from bilateral ITA grafting, together with low risks of DSWI. We fully agree that better perioperative techniques, especially operating room policies, would reduce the occurrence of DSWI in these high-risk patients.

Jean-Christophe Lucet, MD, MPH
Hospital Epidemiology Unit
Bichat-Claude Bernard Hospital
Paris, France

REFERENCES

1. Hazelrigg SR, Wellons HA, Schneider JA, Kolm P. Wound complications after medial sternotomy. *J Thorac Cardiovasc Surg* 1989;98:1096-9.
2. He GW, Ryan WH, Acuff TE, et al. Risk factors for operative mortality and sternal wound infection in bilateral internal mammary artery grafting. *J Thorac Cardiovasc Surg* 1994;107:196-202.
3. Galbut DL, Traad EA, Dorman MJ, et al. Seventeen years experience with bilateral internal mammary grafts. *Ann Thorac Surg* 1990;49:195-201.
4. Grossi EA, Esposito R, Harris LJ, et al. Sternal wound infection and use of internal mammary artery grafts. *J Thorac Surg* 1991;102:342-7.
5. Loop FD, Lytle BW, Cosgrove DM, et al. Sternal wound complications after isolated coronary bypass grafting: early and late mortality, morbidity and cost of care. *Ann Thorac Surg* 1990;49:179-87.
6. Kouchoukos NT, Wareing TH, Murphy SF, Pelate C, Marshall WG. Risks of bilateral internal mammary artery grafting. *Ann Thorac Surg* 1990;49:210-9.

12/8/79784

Materials for tracheoplasty: Which work? Which are best?

To The Editor:

We read with interest the report by Niwa and associates¹ of their clinical experience in infants and adults undergoing esophageal tracheobronchoplasty for a variety of congenital and acquired tracheal lesions. In their discussion these authors expressed the view that on occasion homologous pericardium may not be strong enough to serve as patch material for tracheoplasty procedures.

At the risk of overestimating the values of anecdotal observations, we can report that lyophilized homograft pulmonary artery patches have been used in two infants undergoing anterior tracheoplasties. These patients, aged 5 and 3 months, required simultaneous correction of congenital heart lesions (interrupted aortic arch type B with ventricular septal defect and pulmonary artery sling, respectively). These procedures were done according to methods and management protocols previously described

by others.²⁻⁴ In addition, fibrin sealant was used for suture-line sealing.

In both of these patients, progress has been satisfactory over intervals of $3\frac{3}{4}$ and $2\frac{3}{4}$ years, respectively. Bronchoscopies were done at $1\frac{1}{2}$ year and 2 years in the first patient and at 1 years in the second. These studies showed slight tracheal irregularity, no stenosis, and apparent epithelialization (biopsies not done) (patches were placed adventitia outward). Faint calcifications in the region of these patches appeared by 6 to 12 months on chest x-ray films.

As the authors noted in their discussion, several patch materials can "work" on tracheoplasty procedures. In infants similar to those described here, perhaps lyophilized pulmonary artery homograft can be added to the list. However, it remains to be determined which material is best and in what circumstances. For this reason, we appreciated this report of esophageal tracheobronchoplasty and note the need for further investigations in this area.

D. A. Browdie, MD
R. V. Bernstein, MD
R. Johnson, MD
Fargo, ND 58122

REFERENCES

1. Niwa H, Masaoka A, Yamakawa Y, Hara F, Kondo K, Fukai I, et al. Esophageal tracheobronchoplasty for diseases of the central airway. *J Thorac Cardiovasc Surg* 1996;112:124-9.
2. Edmunds LH Jr, Norwood WI, Low LW. Atlas of cardiothoracic surgery. Philadelphia: Lea & Febiger, 1990:154-5, 104-5.
3. Idriss FS, Delson SU, Ilbawi MM, Gerson CR, Tacker GF, Holinger L. Tracheoplasty with pericardial patch for extensive tracheal stenosis in infants and children. *J Thorac Cardiovasc Surg* 1984;88:527-6.
4. Hamansohn DA, Kesler KA, Turentine MW, Mahomed Y, Means L, Maff B, et al. Anterior pericardial tracheoplasty for congenital tracheal stenosis. *J Thorac Cardiovasc Surg* 1991;102:710-6.

12/8/78756

Mini-T sternotomy for cardiac operations

To the Editor:

A wave of enthusiasm has recently arisen for the use of minimally invasive techniques for cardiac surgery. Some of these techniques include small incisions that have the disadvantage of providing limited exposure.¹ I initially used a T-shaped low sternotomy on a patient who had a tracheostomy, and I have extended its use to other patients after appreciating its multiple advantages compared with other "mini" incisions.

The vertical skin incision extends from the xiphoid to below the angle of Louis. The midline sternotomy starts just to the side of the xiphoid and extends to the level of the second intercostal space, where it is "T'd" to the left and right, care taken to avoid injury to the intercostal pedicles (Fig. 1).

A standard sternal retractor is inserted and exposure of the ascending aorta is enhanced by lifting the manubrium with one of the arms of a Rultrac retractor (Rultrac, Inc., Mentor, Ohio) (Fig. 2), which is conveniently placed high, near the patient's left shoulder and away from the assist-