course of the twist is in the midportion and not near the anastomosis site.

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Effect of right anterolateral thoracotomy on breast development and scoliosis

To the Editor:

We read with great interest the article "The Influence of Right Anterolateral Thoracotomy in Prepubescent Female Patients on Late Breast Development and on the Incidence of Scoliosis" by Bleiziffer and associates.¹ We agree with the authors that the right anterolateral thoracotomy should be abandoned in prepubescent female patients. In fact, we have been using a limited posterior thoracotomy incision for correction of simple congenital heart defects since 1998, and we have also published our data previously.² Earlier studies in young women have also shown that classic anterior and anterolateral thoracotomy incisions lead to unequal breast development.³

Just to update our recent data, we analyzed 35 patients who underwent right posterior thoracotomy from February to October 2004 at our institution. Thirty-one underwent operation for secundum atrial septal defect, 2 for ventricular septal defect closure, and 1 each for repair of tetralogy of Fallot (not requiring transannular patch) and partial atrioventricular canal defect. Ages ranged from 3 to 28 years (mean, 13 $\pm$ 4 years). A standard right posterior thoracotomy incision was made with the anterior limit up to the posterior axillary line.

Cardiopulmonary bypass was instituted by using aortic and bicaval cannulation, and intracardiac repair was performed under fibrillatory or cardioplegic arrest per the surgeons' choice. All patients survived the operation and were extubated within 12 hours after surgery. The mean stay in the intensive care unit was 24 $\pm$ 6 hours. None had phrenic nerve palsy or excessive blood loss. In the postoperative period, there was no short-term limitation of movement of the upper limb. All patients except 2 were discharged on the eighth postoperative day. One had significant residual shunt and had to undergo reoperation through a median sternotomy, and another had a persistent air leak that stopped after 5 days. There was no wound infection.

We believe that right posterior thoracotomy is safe and reproducible and does not require sophisticated equipment. It gives a good scar, which is invisible from the front and is masked by typically worn apparel. It does not interfere with future development and modeling of the breast.

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Reply to the Editor:

We appreciate the comments of Murala and colleagues on our study "The Influence of Right Anterolateral Thoracotomy in Prepubescent Female Patients on Late Breast Development and on the Incidence of Scoliosis."¹ The correspondents describe a right

posterolateral thoracotomy for the repair of atrial septal defect, ventricular septal defect, and tetralogy of Fallot to avoid impaired breast development after an anterior incision.

However, the division or incision of the latissimus dorsi and serratus anterior muscle produces significant trauma to the chest and may cause substantial perioperative morbidity and long-term disability.^{2,3} With this in mind, we developed our own modification of a limited midaxillary thoracotomy,⁴ avoiding both damage of future breast tissue and dissection of large muscle groups. Beginning at the height of the mammary areola in the midaxillary line, a 4.5- to 6.0-cm skin incision passes posteriorly toward the tip of the scapula. The entire anterior border of the latissimus dorsi muscle is freed. The muscle can then be retracted posteriorly, exposing the serratus anterior muscle. This muscle is split in a longitudinal manner, and the thorax is opened in the bed of the fourth rib. Cardiopulmonary bypass is instituted by direct bicaval and aortic cannulation. Femoral or iliac cannulation is not used in any patient. Our described surgical approach in 40 consecutive prepubescent patients so far, with a minimum weight of 15 kg, represents a favorable surgical alternative.

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