that a cytologic examination at the staple margin of wedge resection for lung cancer predicted a recurrence at the margin better than a histologic examination.¹ In this article, Sawabata and coworkers described that 7 of the 15 patients (47%) who underwent wedge resection showed positive cytology at the staple margin, whereas histologic examination showed positive cytology in 3 of the patients (20%). Four of the 7 patients with a positive cytology margin had margin relapse. However, 3 of the 4 patients with recurrence showed a negative histology margin at the staple. In a multicenter prospective study, Sawabata and colleagues² also reported that 40 of 118 patients (34%) showed a positive cytology margin on the staple line in wedge resection for lung cancer, whereas histology showed a positive margin in 18 of the 118 patients (15%). Therefore, they concluded that the cytologic diagnosis on the staple line was more sensitive than histologic diagnosis to show remaining cancer cells at the surgical margin of wedge resection.

Although we have never experienced such a high rate of margin relapse (27%), as well as positive histology margin (20%), in patients with lung cancer who underwent wedge resection, cytologic examination on the staple line could be useful for examining a margin of segmentectomy. Before our present study, one of the authors (H. N.) experienced a margin relapse in a patient who was undergoing upper division segmentectomy for adenocarcinoma, which was treated by completion upper lobectomy afterward. In that patient, although the histology margin was negative in the specimen, cancer cells might remain on the staple margin of segmentectomy. Although histology can show a limited area of the margin, cytologic examination may be able to determine the overall length of the staple line.

However, histologic diagnosis is usually more reliable than cytologic diagnosis. In addition, cytologic examination sometimes shows a vague diagnosis, such as, "it is suspected of malignancy." In fact, Sawabata and colleagues' results¹ showed a cytology positive margin in 47%, which could include false-positive results. Higashiyama and coworkers³ reported far less frequency; a cytologic examination of the surgical margins in patients undergoing limited surgery for lung cancer showed positive results in 11

of 112 patients (9.8%). Although we do not usually use cytologic examination on the staple line in both segmentectomy and wedge resection, we have judged the complete resection by macroscopic findings and histologic diagnosis on the surgical margin. If cytologic examination on the staple line showed positive results, we would determine a further resection by both macroscopic findings and histologic diagnosis of the surgical margin. If we judge the margin to be positive from the total findings, we will further resect the next segment or convert to lobectomy. In fact, we did perform a segmentectomy for 2 segments or 1 segment with 2 subsegments in some patients to take a sufficient surgical margin in our study.

In a multicenter study, Sawabata and colleagues⁴ also reported that the surgical margin was usually negative when the margin distance was greater than 2 cm or the maximum tumor diameter. In our segmentectomy, the margin is usually more than 2 cm as described in the article,⁵ which could be sufficient to make a negative margin. In addition, to make a surgical margin sufficient in segmentectomy, we usually cut the lung surface by electrocautery before cutting by the stapler on the segmental plane, which can make the margin greater than using a stapler alone on lung tissue. Sawabata and colleagues⁴ also reported on a device to make a surgical margin sufficient, that is, a less traumatic jaw closing-type stapler can make the surgical margin negative more frequently than an aggressive clumping type.

We agree with Sawabata and colleagues that an intraoperative histologic or cytologic examination on the surgical margin is important, as well as N-staging during segmentectomy, and that a device to make the margin sufficient is also important.

Hiroaki Nomori, MD, PhD^a

Koei Ikeda, MD, PhD^a

Takeshi Mori, MD^a

Hironori Kobayashi, MD^a

Kazunori Iwatani, MD^a

Koichi Kawanaka, MD, PhD^a

Shinya Shiraishi, MD, PhD^a

Toshiaki Kobayashi, MD, PhD^b

Department of Thoracic Surgery and

Radiology^a

Graduate School of Medical Sciences

Kumamoto University

Kumamoto, Japan

Department of Assistive Diagnostic Technology^b

National Cancer Center Hospital

Tokyo, Japan

References

1. Sawabata N, Matsumura A, Ohta M, Maeda H, Hirano H, Nakagawa K, et al; Thoracic Surgery Study Group of Osaka University. Cytological malignant margins of wedge resected stage I non-small cell lung cancer. *Ann Thorac Surg*. 2002;74:1953-7.
2. Sawabata N, Ohta M, Matsumura A, Nakagawa K, Hirano H, Maeda H, et al; Thoracic Surgery Study Group of Osaka University. Optimal distance of malignant negative margin in excision of nonsmall cell lung cancer: a multicenter prospective study. *Ann Thorac Surg*. 2004;77:415-20.
3. Higashiyama M, Kodama K, Takami K, Higaki N, Nakayama T, Yokouchi H. Intraoperative lavage cytologic analysis of surgical margins in patients undergoing limited surgery for lung cancer. *J Thorac Cardiovasc Surg*. 2003;125:101-7.
4. Sawabata N, Takeda SI, Inoue M, Tokunaga T, Koma M, Maeda H. Spread of malignant cells in the surgical margin with stapled excision of lung cancer: comparison of aggressive clump and less traumatic jaw closure type staplers. *Thorac Cardiovasc Surg*. 2006;54:418-24.
5. Nomori H, Ikeda K, Mori T, Kobayashi H, Iwatani K, Kawanaka K, et al. Sentinel node navigation segmentectomy for clinical stage IA non-small cell lung cancer. *J Thorac Cardiovasc Surg*. 2007;133:780-5.
doi:10.1016/j.jtcvs.2007.03.054

The sinuses of Valsalva: They should be anatomically correct and physiologically compliant

To the Editor:

The article "Six Stitches to Create a Neosinus in David-type Aortic Root Resuspension" by Moritz and colleagues, which appeared in the February issue of the *Journal*,¹ confirms our observations made in the late 1980s on handmade "Valsalva" grafts² and that the onion shape itself guarantees neither physiologic function nor longevity of aortic valve leaflets. Digitized stress measurements further demonstrated that even if 3 sinuses are refabricated, as the authors propose, significant stress reduction was obtained only if the neosinuses closely matched the anatomy of the preserved or implanted leaflets.³ One may get closest to such an arrangement with "custom-made" oyster-form concave leaflets, handmade to match the anatomic features⁴ (Figure 1).

Figure 1. The Robicsek–Thubrikar “tailor-made” sinus graft.

However, even if someone may be able to accomplish an anatomic match between sinuses and leaflets, normal compliance of the aortic wall, a prerequisite to significant stress reduction, will remain elusive. Our experience indicates that positioning the “grooves” of the Dacron prosthesis at the level of the neosinuses vertically will indeed provide some compliance, but it will not reach that of a normal aortic root. Also, with the passage of time even this disappears. It is indeed important to try to imitate Mother Nature in our efforts to restore and maintain aortic valve function by creating neosinuses. We agree with the authors that the onion configuration itself provides very little stress reduction and that the presence of 3 neosinuses may reduce the stress on the aortic leaflets; however, it also needs to be emphasized that this will occur only if the sinuses are appropriately matched with the leaflets, and unless long-lasting compliance is provided, the stress reduction will be temporary and miniscule.

Francis Robicsek, MD, PhD
The Carolinas Heart Institute
Carolinas Medical Center
Charlotte, NC

References

1. Mortiz A, Risteski P, Dogan S, Macit H, Akbulut B, Zierer A, et al. Six stitches to create a neosinus in David-type aortic root resuspension. *J Thorac Cardiovasc Surg.* 2007;133:560-2.
2. Robicsek F. A new ascending aortic prosthesis. United States Patent Office, No. 5, 139, 511, Aug. 18, 1992.

3. Zehr KJ, Thubrikar MJ, Gong CG, Headrick JR, Robicsek F. Clinical introduction of a novel prostheses for valve preserving aortic root reconstruction for annuloaortic ectasia. *J Thorac Cardiovasc Surg.* 2000; 120:692-8.
4. Thubrikar MJ, Robicsek F, Gong GG, Fowler BL. A new aortic root prosthesis with compliant sinuses for valve-sparing operations. *Ann Thorac Surg.* 2001;71: S318-22.

doi:10.1016/j.jtcvs.2007.03.056

Reply to the Editor:

We thank Dr Robicsek for his comment on our article “Six Stitches to Create a Neosinus in David-type Aortic Root Resuspension.” He has extensive experience in this field. We agree that a rigid tube will never achieve the same compliance as the native aortic root, and that this increases the stresses on the leaflets. However, the question is still to be answered if this has clinical impact, especially whether the higher leaflet stresses have more impact on long-term durability than an optimal geometric reconstruction. Because the aortic sinuses and leaflets dilate, stretch, and reshape to an individual configuration in many patients, each leaflet and sinus has to be recreated to achieve an optimal coaptation. Clinical reports do not show perfect or sub-optimal long-term results for the remodeling operation.¹ In David and colleagues’ personal comparison,¹ reimplantation had significantly better long-term results than remodeling.² In our opinion, this is because it is easy to overcorrect the aortic valve in the David procedure, avoiding any sagging and stabilizing the slightly dilated annulus. We fully agree that the onion shape is a suboptimal solution because it does not support the naturally straight course of the commissures. This is optimized by the technique described in our article.

It still has to be proven that the optimal leaflet stress reduction is achieved in the manner suggested by Dr Robicsek, that is, the sinotubular junction is kept rigid by the Dacron tube and the elasticity of the remaining aortic root is preserved. The latter will be reduced by the scarring process in the long term.

Individual matching between sinuses and leaflet is easily accomplished with our technique because the reduction at the sinotubular junction is only done with the valve already inside the tube and thus can be easily positioned at the optimal spot.

Because the total load on the leaflets is determined by the product of area, time’s pressure overcorrection reduces the mechanical stress on the usually enlarged leaflets. There is currently no proof that optimizing root remodeling with respect to compliance and thus possibly reduced leaflet stresses achieves better long-term results than does an optimal straightforward geometric repair with slight overcorrection.

We thank Dr Robicsek for his important thoughts.

Anton Moritz, MD, PhD
Tayfun Aybek, MD, PhD
University of J.W. Goethe
Frankfurt am Main, Germany

References

1. David TE, Feindel CM, Webb G, Colman J, Armstrong S, Maganti M. Long-term results of aortic valve-sparing operations for aortic root aneurysm. *J Thorac Cardiovasc Surg.* 2006;132:347-54.
2. Yacoub M, Gehle P, Chandrasekaran V, Birks E, Child A, Radley-Smith R. Late results of a valve-preserving operation in patients with aneurysms of the ascendens aorta and root. *J Thorac Cardiovasc Surg.* 1998; 115:1080-90.

doi:10.1016/j.jtcvs.2007.05.020

If older donors are acceptable, then older recipients should also be acceptable

To the Editor:

I read with interest the article by De Perrot and colleagues,¹ in the February 2007 issue of the *Journal*.

The article examines the outcome of lung transplantation using lungs obtained from donors aged 60 years or more. The average age of donors was 65 years; the average age of recipients was 49 years.

Considering that the life expectancy of a 60-year-old, just as that of a 50-year-old, exceeds the “predicted life” of the transplanted lung, if elderly people are good enough to be donors, why aren’t they good enough to be recipients? Are we facing age discrimination?

I am most interested in the author’s reply.

Francis Robicsek, MD, PhD
Carolinas Heart Institute
Charlotte, NC