2 published cases[1,3] with air embolism have something in common: an S8 segmentectomy. At present, we have no idea what this means. Is the anatomy of the vascular structures a risk factor?

We also considered air embolism, and our article,[2] which stated, "Potential pitfalls include anomalous bronchial anatomy and air embolism if the pulmonary artery branch is inadvertently punctured," warned of this. We have performed anatomic segmentectomies in 53 patients as of September 2011 and have never experienced an air embolism.[4] We might have just been lucky. However, we take the following steps to avoid air embolism:

- The targeted vessels are divided first.
- When we are certain that the targeted bronchus has been identified, we always divide the bronchus first, hoist the bronchial stump with a string or forceps, and then try to insert the needle into the bronchial stump in the direction of the long axis of the bronchus.
- We always use 100% oxygen gas and a 23-gauge butterfly needle, which is a relatively thin needle.
- The instillation of oxygen into the bronchus is limited to 0.5 to 1.5 L, and the oxygen flow rate is no greater than needed, which prevents excessive air flow into the pulmonary parenchyma.
- If vessel puncture is of particular concern, a thin catheter with a balloon is used instead of a butterfly needle.

We would like to ask Otsuka and associates the following questions:

- What is the direction of puncture of the targeted bronchus?
- What flow rate or air pressure is used?
- Why do you use an 18-gauge needle; is the stump too thick for insertion of a B8?
- Although it was confirmed that there was no blood regurgitation, was air reflux confirmed?
- It is odd that air was not confirmed in the target area after the air was blown into the tube. We postulate that the needle was inserted into the pulmonary parenchyma. If air were to be instilled into the pulmonary parenchyma, an air embolism would not be unusual, as seen with the computed tomography–guided marking technique.[5]

Would you please comment on the last point and elaborate on our questions?

No matter how careful we are, problems can occur, and this may serve to heighten our caution. Finally, we thank Otsuka and associates for providing important information on the pros and cons of the selected segmental inflation technique.

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References

1. Otsuka T, Nakamura Y, Harada A, Sato M. Extremely rare but potential complication of diffuse brain edema due to air embolism during lung segmentectomy with selected segmental inflation technique by syringe needle during video-assisted thoracoscopic surgery. *J Thorac Cardiovasc Surg*. 2011;142:e151-2.
2. Kamiyoshihara M, Kakegawa S, Morishita Y. Convenient and improved method to distinguish the intersegmental plane in pulmonary segmentectomy using a butterfly needle. *Ann Thorac Surg*. 2007; 83:1913-4.
3. Kiribayashi M, Nakasone M, Moriyama N, Mochida S, Yamasaki K, Minami Y, et al. Multiple cerebral infarction by air embolism associated with remarkable low BIS value during lung segmentectomy with video assisted thoracic surgery (VATS) technique: a case report. *Masui*. 2010;59:480-3.
4. Kamiyoshihara M, Kakegawa S, Ibe T, Takeyoshi I. Butterfly-needle video-assisted thoracoscopic segmentectomy: a retrospective review and technique in detail. *Innovations: Technol Tech Cardiothorac Vasc Surg*. 2009;4:326-30.
5. Watanabe K, Nomori H, Ohtsuka T, Kaji M, Naruke T, Suemasu K. Usefulness and complications of computed tomography–guided lipiodol marking for fluoroscopy-assisted thoracoscopic resection of small pulmonary nodules: experience with 174 nodules. *J Thorac Cardiovasc Surg*. 2006;132:320-4.

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Reply to the Editor:

We thank Kamiyoshihara, Nagashima, and Igai for their comments on our article[1] and are pleased to reply.

Pulmonary segmentectomy with video-assisted thoracic surgery procedures has been one of the common methods for lung cancer as smaller tumors have begun to be identified. The selected segmental inflation technique is frequently used in Japan for detecting the intersegmental plane.[2,3] We also used the technique with an 18-gauge needle, as we mentioned.[1] We punctured the bronchus longitudinally just as Kamiyoshihara, Kakegawa, and Morishita[2] described. To puncture a bronchus, we use a relatively thick needle, which is less resistant while air is being blown. The punctured stump of the B8 on this occasion was more than 5 mm across. There was no thickening of the bronchial wall, which we did not find difficult to puncture. We used air, not oxygen, to inflate the selected segment to avoid explosion. Air was blown at a pressure of 0.1 MPa by using a regulator. No blood regurgitation was confirmed under atmospheric pressure when the inner needle was removed after the syringe needle punctured the bronchus. Inasmuch as negative pressure was not applied by using a syringe, air regurgitation was not confirmed.

As Kamiyoshihara, Nagashima, and Igai, pointed out, it is odd that air was not confirmed in the target area after the air was blown into the tube. We would like to suggest 2 possible reasons for this. First, as the authors suggested, air blown into the lung parenchyma via the tip of the needle caused air embolism at the end. The other possible reason is that the tip of the needle moved accidently into the vein, which allowed air to be blown directly into it, causing air embolism. It is hard to ascertain which mechanism caused the complication this time. There would be less risk of air embolism if we adopted the technique that Kamiyoshihara has used.

However, so long as the needle method is used, there is always a potential risk of air embolism caused by the tip of a needle moving accidently. We recommend an ''open-cut'' selected segmental inflation technique without use of a needle or the selected segmental inflation technique through a thin bronchoscope.[3]

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References

1. Otsuka T, Nakamura Y, Harada A, Sato M. Extremely rare but potential complication of diffuse brain edema due to air embolism during lung segmentectomy with selected segmental inflation technique by syringe needle during video-assisted thoracoscopic surgery. *J Thorac Cardiovasc Surg*. 2011;142:e151-2.
2. Kamiyoshihara M, Kakegawa S, Morishita Y. Convenient and improved method to distinguish the intersegmental plane in pulmonary segmentectomy using a butterfly needle. *Ann Thorac Surg*. 2007; 83:1913-4.
3. Okada M, Mimura T, Ikegaki J, Katoh H, Itoh H, Tsubota N. A novel video-assisted anatomic segmentectomy technique: selective segmental inflation via bronchofiberoptic jet followed by cautery cutting. *J Thorac Cardiovasc Surg*. 2007;133:753-8.

doi:10.1016/j.jtcvs.2011.12.049

THE USE OF RADIOFREQUENCY ABLATION FOR PATIENTS WITH NONDYSPLASTIC BARRETT'S ESOPHAGUS

To the Editor:

In his recent commentary article entitled ''Radiofrequency ablation for nondysplastic Barrett's esophagus: Should we do it, because we can?'' Veeramachaneni[1] summarizes his perspective with the statement that ''In light of the ambiguity of the natural history of Barrett's esophagus without dysplasia, radiofrequency ablation should currently only be done in the context of a clinical trial.'' Although we do agree that the routine use of radiofrequency ablation for patients with nondysplastic Barrett's esophagus (BE) should not be considered the standard of care, we also believe that several considerations need to be taken into account before such a blanket statement can be made.

First, as Veeramachaneni[1] correctly points out, the current recommendation for nondysplastic BE consists of surveillance endoscopy with systematic biopsy. Even so, it is well documented that the majority of physicians in the United States and abroad do not follow the recommendations, especially relating to the number and systematic nature of the biopsy samples needed.[2]

Second, a significant number (as many as half) of patients with BE who have had either high-grade dysplasia or invasive cancer did *not* have dysplasia detected during their previous endoscopies.[3]

Third, all patients with nondysplastic BE are probably not the same with regard to their cancer risk. For example, patients with longer segments of BE appear to be at a higher risk of development of invasive cancer.[4] In addition, younger patients with BE may also be at a higher risk of eventual development of invasive cancer, as extrapolated from evidence that indicates that the duration of BE is a determinate of cancer risk[4] combined with recent population-based data that suggest that the annual risk of development of invasive cancer persists with time.[5]

Fourth, radiofrequency ablation for BE is a very safe procedure, and it is associated with an extremely low complication rate.[6] Indeed, among the 179 ablation procedures performed in our own phase II clinical trial (both dysplastic and nondysplastic BE), adverse events occurred after only 13 procedures (7%), and all complications were minor: fever (n = 5), inability to line up the circumferential ablation device effectively (n = 3), self-limited bleeding (n = 1), asymptomatic and spontaneously resolving stricture (n = 1), aspiration (n = 1), transient heart block (n = 1), and esophageal candidiasis (n = 1).

Finally, radiofrequency ablation results in eradication of BE in the majority of cases in which it is used.[6] Further, data from a randomized, sham-controlled trial indicate that cancer risk is reduced by the use of radiofrequency ablation in patients with dysplastic BE.[6] Whether this cancer prevention effect persists for nondysplastic BE is unknown and would require a much larger randomized trial to address.

In summary, although we agree that radiofrequency ablation should not currently be used routinely for nondysplastic lesions, we are fortunate enough to have access to a very safe, effective technology for eradicating BE. Given this fact, along with the variable malignant potential of nondysplastic BE, the ''ambiguity'' associated with nondysplastic BE that Veeramachaneni describes in his commentary, and the inconsistencies inherent in the practice of surveillance, we believe that the universal exclusion of patients with nondysplastic lesions from access to radiofrequency ablation is a mistake.

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References

1. Veeramachaneni N. Radiofrequency ablation for nondysplastic Barrett's esophagus: Should we do it, because we can? *J Thorac Cardiovasc Surg*. 2011;142:1173-4.
2. Amamra N, Touzet S, Colin C, Ponchon T. Impact of guidelines for endoscopy in patients with Barrett's esophagus: a multifaceted interventional study. *Gastroenterol Clin Biol*. 2009;33: 470-7.
3. Sharma P, Falk GW, Weston AP, Reker D, Johnston M, Sampliner RE. Dysplasia and cancer in a large multicenter cohort of patients with