



One-Step for Lobectomy and Two-Step for Pneumonectomy: Different Dances for Different Tunes

Bobby Yanagawa, MD, PhD,* Amine Mazine, MD, MSc,[†] Robert J. Cusimano, MD,[†] and Michael J. Reardon, MD[‡]

We thank Barac et al from Duke for their interest in our review and congratulate them on an excellent outcome.¹ The authors describe a young patient with large sarcoma in the left atrium involving the right lower lung lobe.² The authors achieved wide exposure of a large left atrial tumor by dividing the superior vena cava, aorta, and pulmonary artery, a partial autotransplant, allowing resection of the tumor and right lower lobectomy as a single step. With lobectomy, the remaining lobe will expand to fill the pleural space and as such, we completely agree with their approach. In fact, we have also used a “partial autotransplant” approach for cardiac tumor resection and agree it is very useful in selected cases.³

We have been faced with tumors requiring extensive cardiac resection and complete pneumonectomy. These large cardiac resections done on bypass can be coagulopathic and complete pneumonectomy leaves a large cavity into which the patient can bleed post procedure. Our first 7 cases that combined autotransplant for large left atrial tumors requiring pneumonectomy were performed as a single step. Three of 7 patients became severely coagulopathic and bled into the remaining empty pleural space despite aggressive attempts at packing and control of bleeding. They received multiple transfusions, developed unilateral pulmonary edema in the remaining lung, right heart failure, and expired from this sequence of events. The Texas Two-Step Procedure was developed for *cardiac tumor resection and complete pneumonectomy*.⁴ The Texas Two-Step Procedure was designed to separate the on-pump cardiac resection, with the associated coagulopathy, from the pneumonectomy with its empty pleural space. This



Bobby Yanagawa, MD, Amine Mazine, MD, Robert J. Cusimano, MD, Michael J. Reardon, MD.

allows the patient to recover from the cardiac procedure before proceeding with pneumonectomy as a separate procedure. We now have used this two-step approach in 7 cases requiring large cardiac resection and pneumonectomy with no operative deaths.

As noted in our review, we have now operated on 127 primary cardiac sarcomas and based on this experience, we believe that this complex surgery can improve survival and quality of life in carefully selected patients with primary cardiac sarcomas.^{5–8} We again congratulate Dr Barac et al and thank them for adding to this experience. It is worthwhile to reiterate that we believe that such patients should be seen by and evaluated by an experienced, multidisciplinary cardiac tumor team prior to assigning treatment.

*Division of Cardiac Surgery, Department of Surgery, St Michael's Hospital, University of Toronto, Toronto, Ontario, Canada

[†]Division of Cardiac Surgery, Department of Surgery, Peter Munk Cardiac Centre, Toronto General Hospital and University of Toronto, Toronto, Ontario, Canada

[‡]Department of Cardiovascular Surgery, Houston Methodist DeBakey Heart and Vascular Center, Houston Methodist Hospital, Houston, Texas

Disclosures: The authors have no disclosures for this paper.

Address reprint requests to Michael J. Reardon, MD, Department of Cardiovascular Surgery, Houston Methodist DeBakey Heart and Vascular Center, Houston Methodist Hospital, 6550 Fannin Street, Suite 1401, Houston, TX 77030. E-mail: mreardon@houstonmethodist.org
DOI of original article: <http://dx.doi.org/10.1053/j.semtcvs.2018.09.001>, <http://dx.doi.org/10.1053/j.semtcvs.2019.01.012>.

REFERENCES

1. Yanagawa B, Mazine A, Chan E, et al: Surgery for tumors of the heart. *Semin Thorac Cardiovasc Surg* 30:385–397, 2018
2. Barac Y, Harpole Jr. D, Ghadimi K, et al: A one step auto-transplantation can facilitate the excision of cardiac tumors invading the lung. *Semin Thorac Cardiovasc Surg* 31:475–476, 2019

3. Al-Sabeq B, Shen S, Reardon M, et al: Lightning striking twice: Redo mitral valve replacement due to recurrent cardiac sarcoma using partial autotransplantation technique. *J Thorac Cardiovasc Surg* 2019. In press
4. Chan E, Reul R, Kim M, et al: The “Texas Two-Step” procedure. *J Thorac Cardiovasc Surg* 155:285–287, 2018
5. Ramlawi B, Leja M, Abu Saleh W, et al: Surgical treatment of primary cardiac sarcomas: Review of a single-institution experience. *Ann Thorac Surg* 101:698–702, 2016
6. Watson R, Frye J, Trieu M, et al: Primary undifferentiated pleomorphic cardiac sarcoma with MDM2 amplification presenting as acute left-sided heart failure. *BMJ Case Rep*: 1–5, 2018. pii: bcr-2018-226073
7. Aguilar C, Soca R, Guillen M, et al: Cardiac undifferentiated pleomorphic sarcoma incidentally diagnosed during mitral valve replacement. *J Card Surg* 32:91–92, 2017
8. Ramlawi B, Al-Jabbari O, Blau L, et al: Autotransplantation for the resection of complex left heart tumors. *Ann Thorac Surg* 98:863–868, 2014