Reviewer's report

Title: Left upper lobectomy can be a risk factor for thrombosis in the pulmonary vein stump

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Reviewer: ATSUSHI WATANABE

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his paper deserves our attention on PV stump thrombosis as a rare complication after LUL. However, I have the following comments and questions:

Minor Essential Revisions

### In the present study, thrombosis in the pulmonary vein stump was detected in 5 of 151 patients (3.3%). All 5 patients underwent left upper lobectomy (17.9% of 28 patients who underwent LUL). On the other hand, in their previous report, thrombosis in the PV stump after lobectomy was detected in 7 of 193 NSCLC patients (3.6%). All 7 patients underwent LUL (13.5% of 52 patients who underwent LUL). One of the 7 patients developed cerebral infarction. Combining the 2 studies, 12 of 344 patients (3.5%) experienced thrombosis. In particular, 15.0% of 80 patients who underwent LUL had thrombosis, in which 1 patient (1.25%) developed cerebral infarction. In this series, it can be concluded that the occurrence of PV stump thrombosis and cerebral infarction is higher than what we know. Routine contrast medium–enhanced CT of the chest should be performed in all patients after left upper lobectomy. However, I can hardly recall this complication in my experience of pulmonary lobectomy. The authors comment that if patients who undergo lobectomy are followed-up using contrast-enhanced CT and if doctors conducting check-up observe the PV stump on contrast-enhanced CT images, more patients with thrombosis in the PV stump may be detected. In a sense, this practice may increase awareness on PV stump thrombosis detection but infarction of vital organs is hardly observed. These results are hard to understand.

#2 In the section of Patients, of the 203 consecutive patients who underwent lobectomy from April 2008 to December 2012 in the author’s hospital, 151 patients who underwent contrast-enhanced chest CT at least once within 2 years after the lobectomy were selected. Fifty-two of 203 patients did not undergo contrast-enhanced chest CT. Why did these patients not undergo the chest CT? If one of the reasons is that these patients underwent lobectomy except LUL, we may underestimate the occurrence of thrombosis in PV stumps, except for a LSPV stump.

#3 In the section of Operative procedure, the authors described that if the PV could not be divided at that time, one or two branches were divided with ligation, and the rest of the PV was divided using a linear stapler. In our institute, LSPV was divided at the level of the origin. In most of the cases, we cannot find the
branches of LSPV at the stapler line. In the authors’ institute, how many cases (rate) of one or two branches of LSPV were divided with ligation? I suspect that a unique surgical procedure or the location of access port from which the endostapler was inserted resulted in the rare condition of LSPV stump. Do the authors have any comments on this issue?

#4 In the section of Discussion, the authors described that in their previous report, it was demonstrated that the LSPV stump remained significantly longer than the other 3 PV stumps. What does this issue mean? Is intrapericardial LSPV longer than the other 3 PVs? Alternatively, do any limitations on the surgical procedure make the LSPV stump longer than the other 3 PV stumps? If the latter is the reason what are the limitations?

#4 In the section of Discussion, contrast-enhanced CT must be performed as early as possible at least one time after LUL. Since it is difficult to demonstrate the PV stump by echocardiography after lobectomy, we recommend contrast-enhanced CT. Certainly, contrast-enhanced CT is useful. I think transesophageal echocardiography is useful and less-invasive to demonstrate the PV stump, too. The authors should think how the use of transesophageal echocardiography will affect the detection of PV stump thrombosis.

#5 In the section of Discussion, the authors described that if a thrombus in the LSPV stump is detected without an embolism, anticoagulant therapy should immediately be started. However, in the section of results, it was described that only 2 of five patients with PV stump thrombosis received anticoagulant therapy. In one patient, thrombosis was not found at that time and then disappeared after 9 months without any treatment. In these 2 patients, the thrombosis was followed-up. In particular, three patients did not receive anticoagulant therapy and there was no infarction of the vital organs.

#6 From the authors’ previous report, we know two types of thrombus which occur in the PV stump after lobectomy. One type is a floating thrombus in the PV stump that could cause embolism to vital organs and may be caused by stagnant blood flow in the long stump of the PV. Another type is thrombus in the stump of the RSPV branch after right upper or middle lobectomies; in which such thrombus could obstruct the remaining branch of the RSPV. In these 5 cases, is the thrombosis the former type? If so, why was anticoagulant therapy not given to all patients?

#7 In 2 patients, anticoagulant therapy was immediately started, and CT a few months after the operation showed that the thrombus had disappeared. Was the anticoagulant therapy stopped or continued after the disappearance of the thrombus? The issue should be described in the section of results.

**Level of interest:** An article of importance in its field

**Quality of written English:** Needs some language corrections before being published
**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests.