Peer Review File

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Reviewer A

This is an interesting study describing compensatory lung growth (CLG) after each lobectomy using the left-right blood flow ratio (BFR) on DCR and functional lung volume (FLV) constructed using chest CT image. Although recovery of lung volume over time after lobectomy is known, blood flow recovery remains to be determined. Therefore, this paper will be of interest to readers. I have several suggestions to improve this paper.

Reply: We greatly appreciate your review of our manuscript. Thank you for your valuable insights and suggestions. We have addressed each of these suggestions as follows. Your guidance and feedback are highly appreciated.

1. p7 : 226 ~

The authors stated that 'In this study, we postulated that the variation in blood flow recovery may be attributed to the differences in volume recovery of the right middle lobe after RUL.' Does the degree of atelectasis of the middle lobe after right upper lobectomy can affect blood flow recovery of another lobe postoperatively?

Reply 1: The discussion in our paper addresses the reasons for the variations in blood flow recovery observed during bilateral upper lobectomy. In lower lobectomy cases, the remaining upper lobe does not experience significant displacement, whereas the remaining lower lobe after upper lobectomy exhibits substantial cephalad displacement. This displacement can potentially lead to vascular distortion and decreased blood flow owing to vessel bending. However, on the right side, the middle lobe influences superior displacement of the remaining lower lobe. Adequate aeration of the middle lobe can mitigate this displacement, and if middle lobe expansion is compromised, poor blood flow recovery can occur, similar to that in left upper lobectomy. Although the extent of middle lobe reexpansion may influence the other lung lobes, we cannot entirely dismiss this possibility. However, we speculate that this effect is not as significant as indicated here.

2. p8 : 241 ~

The authors suggested that the overinflation caused by the check valve mechanism in the left lower lobe after left upper lobectomy. Does the check valve work at the level of the thick lobe bronchus?

Reply 2: When conducting this study, we also performed 3-dimensional reconstruction of the bronchial tree from the CT scans. We did not detach the pulmonary ligament even during upper lobe resection, and initially assumed minimal bending of the bronchus. However, in reality, we observed stenosis at the level of the basal segmental bronchus after the B6 bifurcation in most cases. This appears to be a potential site for the formation of check valves. It cannot be ruled out that there might have been contributing factors at the level of the peripheral bronchi below

the segmental bronchi, as evaluating these branches presents challenges.
3. A lung with good functional gas exchange is considered a lung with high ventilation and blood flow. In the sitting position during DCR, blood flow is thought to be more in the lower lobes due to gravity. In addition, the thoracic cavity is more negatively pressurized after lobectomy, which may affect blood flow. It would be more useful to the reader if you could add some additional discussions based on these points. Phase-contrast cardiac MRI is also mentioned; however MRI is scanned in the supine position. Therefore, comparison with this study is difficult.

Reply 3: Thank you for your valuable feedback. The distribution of postoperative blood flow is influenced by a multitude of factors, as correctly pointed out. Changes in intrathoracic pressure on the affected side and a reduction in the pulmonary vascular bed interact reciprocally to determine the allocation of blood flow between the left and right lungs. Additionally, the effects of gravity come into play, but their significance varies depending on the location of the remaining lung lobes. Isolating the extent of each influence individually is challenging. DPDR is designed to evaluate lung blood flow distribution as a cumulative outcome of these factors, both visually and quantitatively. However, we acknowledge the limitations of DPDR due to cardiac shadows. Thus, we see the importance of aligning it with established assessment methods, such as phase-contrast cardiac MRI, to enhance precision. While the advantages of DCR include the potential for imaging in more physiological positions, such as sitting or standing, the options for assessing blood flow are restricted. As you have rightfully mentioned, phase-contrast cardiac MRI also involves supine measurements. Nonetheless, DCR is also capable of imaging in the supine position, and at this point, we consider it reasonable to extrapolate insights from comparisons based on supine imaging.
We have appended the following sentence to P8, L258. If our response does not accurately address your concerns, we will remain open to further revisions based on your guidance.

Changes in the text (see Page 8, line 258): However, the postoperative assessment of practical lung function aims to confirm the maintenance of adequate gas exchange, which is determined by the balance between blood flow and ventilation. Various factors influence blood flow, such as the effect of increased negative pressure in the thoracic cavity on blood flow after lung resection, counteracted by the decrease in vascular bed, as well as differences in gravitational effects based on the type of remaining lung lobes. The assessment of blood flow in this study represented the summation of these contributing factors.

Reviewer B

This is an excellent study of a very clinically important topic. Particularly interesting were the findings that 1. upper lobectomies initially resulted in more diminished pulmonary blood flow post operatively than expected and 2. the following LUL there was marked delay or lack in improvement in pulmonary blood flow. These data may be used in the future to assist patients who are experience SOB in our survivorship programs.

Reply: We are grateful for the reviewer's positive comments on our study, particularly the insights into postoperative pulmonary blood flow after upper lobectomy. Your feedback will greatly enhance our efforts to support patients with shortness of breath during the survivorship program. Thank you for your valuable input.

Reviewer C

Thanks for your sincere work that could improve the JTD, but some revisions may be required for strengthening yours.

Reply: We greatly appreciate your review of our manuscript. Thank you for your valuable insights and suggestions. We have addressed each of these suggestions as follows. Your guidance and feedback are highly appreciated.

1. Controlling variables. Comorbidities such as COPD or asthma could make big implications on the lung volume and function. The current status of the disease and drug compliance may be helpful for understanding your patients and proper control of the variables are required. Exercise could change the lung volume and function, but no data could be found. It is same in the severe and uncontrolled pain. Please provide detailed information and control them

Reply 1: Thank you for your comment. We acknowledge this limitation as mentioned in our manuscript. The sample size was indeed notably small, which prevented us from conducting a comprehensive analysis of the relationships based on various clinical factors. We will address these issues by increasing the number of cases in future studies. Regarding the statement, "Exercise could change the lung volume and function, but no data could be found," I kindly request guidance on the specific data that should be provided. I have prepared to incorporate the required data into the manuscript according to your guidance. Your assistance is invaluable, and we are dedicated to revising the manuscript accordingly.

2. Comparison between conventional data and yours. We have conventional gold standard of PFT or lung function test such as Vo2 max. It would be better if you compare them.

Reply 2: Thank you for your suggestion. In our study, we conducted DPDR and simultaneous spirometry assessments preoperatively and at 1, 3, 6, and 12 months postoperatively. This allowed us to investigate the correlation between lung volume recovery and functional assessment using spirometry. However, owing to its potential complexity, we chose not to delve into this aspect in detail in this report. We plan to conduct a more comprehensive analysis of this matter in future studies. However, obtaining an absolute evaluation of the pulmonary blood flow is challenging, and assessments are conducted based on a comparison between the left and right sides. Therefore, determining how to assess the relationship with lung function recovery is a task for future investigations.

3. Clinical implications. Understanding the changes in lung function after surgery is undoubtedly valuable. However, the crucial question is: What practical insights can we derive from these findings? While the academic significance of the study's outcomes is evident, the

authors should emphasize the practical and clinical implications for the readers of JTD.
Reply 3: Thank you for your invaluable advice. To underscore the practical and clinical significance of the results of this study, we have incorporated the undermentioned text. We kindly request your review, and would greatly appreciate any further suggestions regarding these additions.

Changes in the text (see Page 8, line 258): However, the postoperative assessment of practical lung function aims to confirm the maintenance of adequate gas exchange, which is determined by the balance between blood flow and ventilation. Various factors influence blood flow, such as the effect of increased negative pressure in the thoracic cavity on blood flow after lung resection, counteracted by the decrease in vascular bed, as well as differences in gravitational effects based on the type of remaining lung lobes. The assessment of blood flow in this study represented the summation of these contributing factors. DPDR offers visual and quantitative information to analyze the factors behind shortness of breath in postoperative patients, a concern that has been difficult to assess due to challenges in evaluating lung perfusion distribution. As gas exchange evaluation was not performed in this series, future plans involve accumulating case analyses combining symptom progression.

Reviewer D

This study is an analysis of pulmonary blood flow and functional lung volume after lobectomy. The authors' research spirit is great and can be appreciated, but there are major limitations and problems.

Reply: We greatly appreciate your review of our manuscript. Thank you for your valuable insights and suggestions. We have addressed each of these suggestions as follows. Your guidance and feedback are highly appreciated.

1. The sample size is very small, it is too small to detect the relationship between pulmonary blood flow and functional lung volume after lobectomy. Especially, right middle lobectomies are only 4 patients. In addition, adjuvant therapy and complications after surgery could have a big influence on the results, but it were not analysed. The numbers of patients who performed lobectomy were only from 4 to 26, and there could be big effects caused by these factors such as adjuvant therapy and complications because of the small sample size. So, the results could be misleading.

Reply 1: We acknowledge this limitation as mentioned in the manuscript. The sample size was indeed notably small, which prevented us from conducting a comprehensive analysis of the relationships based on various clinical factors. Moreover, the potential impact of adjuvant therapy and postoperative complications on our findings, although significant, could not be adequately explored owing to the small sample size. Nevertheless, it is worth noting that some consistent trends were observed across all cases, excluding middle lobectomies. We view this study as a pilot effort, and hope that further accumulation of cases will allow for more robust future analyses.

2. The title may not be appropriate. The authors analysed blood flow, functional lung volume, and estimated lung weight.

Reply 2: If the Editor grants approval, we would like to modify the title to the following even though it exceeds the specified character limit for the title:

Changes in the text (see Page 1, line 1): Relationship between pulmonary blood flow and volume following lung resection using dynamic perfusion digital radiography

3. The scale of Figures is too wide to be understood intuitively. It can be improved by making the scale more nallower.

Reply 3: We appreciate the reviewer's feedback on the scales of the figures. We understand their concerns about intuitive comprehension. However, our intention behind maintaining the current scale is to ensure that crucial details and trends are clearly visible, especially given the complexity of the data and the specific nuances that we aim to convey. We have carefully considered various options and concluded that the current scale provides the best balance between visual clarity and information preservation. We believe that this approach is essential for the accurate representation and interpretation of our results. We hope the reviewer recognizes the importance of this decision and finds the figures sufficiently informative as they stand.

4. On Page 6, Line 177-179, the middle lobe volume was mentioned. However, I cannot read about it from Figure 3.

Reply 4: We apologize for the confusion. The volume of the middle lobe is shown in Supplementary Figure 1, in which the middle lobe volume after the right upper lobectomy in “A” shows a plateau at the ratio of the change in postoperative to preoperative volume of less than 1, whereas the middle lobe volume after the right lower lobectomy in “C” exhibits an increase of up to 1.4 times in the ratio of the change in postoperative to preoperative volume.

5. On Page 6, Line 192, I could not understand the meaning of (V3).

Reply 5: Thank you for your valuable comments and suggestion. The reference to “(V3)” was indeed a typographical error; it should have been depicted as “Table 3.” We sincerely apologize for any inconvenience this may have caused. The necessary corrections have been made.

Reviewer E

The authors investigate the temporal changes in lung morphology and hemodynamics after lung resection using DCR, which is an intriguing and innovative concept. This research has the potential to provide valuable insights into the field. However, there are several concerns that need to be addressed before the manuscript can be accepted.

Reply: We greatly appreciate your review of our manuscript. Thank you for your valuable insights and suggestions. We have addressed each of these suggestions as follows. Your guidance and feedback are highly appreciated.

Major comments:

1. While the investigation into the sequential changes in lung morphologies and hemodynamics after lung resection based on lobe differences is interesting and innovative, the clinical significance of the results remains somewhat unclear. It would be beneficial to elaborate more on how and in what situations the results of this study can be applied in clinical medicine.

Reply 1: Thank you for your valuable advice. To underscore the practical and clinical significance of the results of this study, we have incorporated the undermentioned text. We kindly request your review, and would greatly appreciate any further suggestions regarding these additions.

Changes in the text (see Page 8, line 258): However, the postoperative assessment of practical lung function aims to confirm the maintenance of adequate gas exchange, which is determined by the balance between blood flow and ventilation. Various factors influence blood flow, such as the effect of increased negative pressure in the thoracic cavity on blood flow after lung resection, counteracted by the decrease in vascular bed, as well as differences in gravitational effects based on the type of remaining lung lobes. The assessment of blood flow in this study represented the summation of these contributing factors. DPDR offers visual and quantitative information to analyze the factors behind shortness of breath in postoperative patients, a concern that has been difficult to assess due to challenges in evaluating lung perfusion distribution. As gas exchange evaluation was not performed in this series, future plans involve accumulating case analyses combining symptom progression.

2. In the DCR, the left lower lung field may be obscured by the shadow of the heart and diaphragm, leading to a potential underestimation of the lung perfusion values in the left lung. In contrast, lung volume evaluation by CT is not affected since it does not have blind spots. This issue may have an impact on the results, particularly in cases involving left-side lung resection. It is important for the authors to address this point in the manuscript and explain how they managed this potential limitation.

Reply 2: Thank you very much for your crucial observation regarding the blood flow evaluation using DPDR.

The defined range for measuring the left lung considered the lung fields, excluding areas overlapping with the shadow of the heart. Consequently, blood flow in certain regions of the left lower lobe, specifically around S8 and S10, was underestimated. It is challenging to rectify this underestimation for each individual case because of various background factors such as the distribution of lung volume due to congenital factors and heart enlargement associated with cardiac conditions. Furthermore, postoperative alterations in anatomical structures contribute to the complexity of this issue. While your concern primarily applies to left lung resection, the impact differs between upper and lower lobectomies. Notably, this influence was more pronounced in cases of upper lobectomy. After lower lobectomy, the remaining upper lobe experiences minimal displacement, whereas upper lobectomy leads to cranial displacement of the remaining lower lobe. Beyond these spatial changes, other factors, such as rotation of the remaining lung tissue, lateral displacement of the mediastinal structures (including the heart), and elevation of the diaphragm, further compounded this issue. Owing to the multifaceted nature of these changes, predicting the extent of overlap between the lung fields and cardiac shadows becomes even more challenging postoperatively than preoperatively. It is important to recognize that this limitation stems from the inherent two-dimensional nature of DPDR assessments and remains unaddressed.

To date, reports on left–right blood flow ratios, as shown in table, have been presented using blood flow scintigraphy and MRI. In this study, using DPDR, we measured a left–right blood flow ratio of 54.2:45.8 prior to surgery. Although this ratio did not exhibit substantial deviation, it is important to acknowledge that this comparison was limited to nonsurgical cases. Nevertheless, it is reasonable to assume that only approximate values were obtained. The comparison of lung capacity evaluates correlations with changes before and after surgery, and we believe that it provides a sufficient understanding of the trends.

I have incorporated the points you raised in the "Limitations" section of the manuscript. We appreciate your insightful remarks, which have significantly contributed to our work.

		Upright position	Supine position
Benumof JL, et al. Aitkenhead AR, et al.	Anesthesia for thoracic surgery. W. B. Saunders Company; 1995. Smith & Aitkenhead's Textbook of Anaesthesia. 6th edition ed: Churchill Livingstone, Elsevier 2013.	Rt:Lt = 55:45	Rt:Lt = 55:45
Björn Wieslander, et al.	J Cardiovasc Magn Reson. 2019 Nov 11;21(1):69.		RT:Lt = 54:46
Dale L Bailey, et al.	Semin Nucl Med. 2019 Jan;49(1):58-61.	Rt:Lt = 51.8:48.2	Rt:Lt = 50.5:49.5

Changes in the text (see Page 8, line 251-253): Secondly, there is the challenge of blind spots during the evaluation of blood flow in the left lung field. DPDR entails a two-dimensional assessment, which may lead to an underestimation of areas overlapping with cardiac shadows. To date, reports of blood flow ratios utilizing perfusion scintigraphy or MRI have indicated the right-side accounting for 50.5% to 55% (27,28). This study's value of 54.2% does not markedly deviate from these figures. Although our previous studies have reported a high correlation between the BFR and PPS (8,10) measured by the cross-correlation analysis. Further investigations, including correlation with phase-contrast cardiac MRI (7), are necessary to accurately determine the left and right blood flow.

Minor comments:

1: Page 3, Line 73:

A recent report highlighted the diagnostic potential of DCR in identifying chronic thromboembolic pulmonary hypertension (CTEPH) among patients with pulmonary hypertension (Radiology. 2023 Mar;306(3):e220908. doi: 10.1148/radiol.220908). Please cite this work.

Reply 1: As per your suggestion, we have added references to the revised manuscript.

Changes in the text (see Page 3, line 71-72): DPDR is useful for diagnosing chronic thromboembolic pulmonary hypertension (CTEPH) (11), distinguishing between pulmonary arterial and CTEPH (12), and evaluating thrombus reduction assessment (13).

2: Page 4, Line 106:
Please provide more details about the scan parameters used in DCR. Was a uniform scan protocol applied, or were modifications made based on body size? It is important to consider that X-ray translucency can be influenced by chest wall thickness.

Reply 2: Thank you for your comment. DCR utilizes a standardized scanning protocol, and the scan parameters were applied as instructed.

Changes in the text (see Page 4, line 101-105):
Imaging protocol for DCR
A prototype dynamic imaging system (Konica Minolta, Inc., Tokyo, Japan) composed of an indirect-conversion flat-panel detector (PaxScan, 4343CB, Varex Imaging Corporation, Salt Lake City, UT, USA), an X-ray tube (RAD-94/B-130H, Varian Medical Systems, Inc., Palo Alto, CA, USA), and a pulsed X-ray generator (EPS45RF, EMD Technologies, Saint- Eustache, Canada). All participants were scanned in a sitting position at a pulse rate of 15 frames/s during breathing patterns, regulated by automated voice guidance. The exposure conditions were as follows: tube voltage, 100 kV; tube current, 40 mA; duration of pulsed X-ray, 5 ms; source-to-image distance, 2 m; an additional filter, 0.5 mm Al + 0.1 mm Cu.
BFR measurement from pulmonary perfusion analysis using DCR
Pulmonary perfusion analysis using DCR was used preoperatively and at 1, 3, 6, and 12 months after surgery, as previously reported (8,10). In detail, pulmonary perfusion was analyzed using dynamic images taken during breath-holding at a resting inspiratory level for 7 s using the cross-correlation method.

3: Page 4, Line 104:
Does "seated" refer to "performed in the sitting position"? If so, it is important to clarify that DCR was performed in the sitting position while CT was performed in the supine position in this study. Gravity strongly influences the distribution of pulmonary blood flow, and DCR can be performed in both sitting (or standing) and supine positions. Therefore, it is necessary to explain the rationale behind selecting the sitting positional DCR instead of the supine positional DCR and discuss whether the difference in scan positions might have influenced the results.

Reply 3: Thank you for your insightful comments. Indeed, “seated” does refer to the imaging being performed in a sitting position. While we did specify that DCR imaging was conducted while seated, we have now clarified that CT imaging was performed in the supine position. The

decision to assess blood flow in a seated position was motivated by the aim of observing the pulmonary blood flow distribution under more physiologically relevant conditions. Currently, our blood flow assessment is limited to comparing the left and right ratios, which is why we have not evaluated the vertical influences due to gravity. Rather, we believe that it is pertinent to assess whether blood flow ratios differ between the supine and seated positions. Given that neither imaging position was included in this study, making a direct comparison challenging, we anticipate addressing this issue in future research.
Furthermore, it's important to note that CT volumetry solely assesses lung capacity and doesn't encompass blood flow evaluation. Since there are few reports on CT volumetry performed in positions other than the supine position, we lack substantial evidence to comprehensively explain its impact on positional measurements. Considering that volume assessment is primarily based on pre- and post-operative comparisons, we expect minimal impact on the unaffected side, where the number of lung lobes remains consistent. While the vertical effects may be significant in cases of right-sided surgery with two remaining lobes, we predict that the impact is negligible for left-sided surgery, where only one lobe remains. Thus, owing to the different evaluation targets in each test, we maintain that any positional comparison differences are unlikely to significantly influence the results.
We greatly appreciate your consideration and understanding.

Changes in the text (see Page 4, line 117-119): Non-contrasted chest CT images were acquired with participants in a supine position preoperatively and at 3, 6, and 12 months after surgery using an Aquilion ONE 80-detector CT scanner (Canon Medical Systems Corporation, Tochigi, Japan) with breath-holding at the end of inspiration.

4: Page 4, line 109, Video 1
The video and figure are helpful for understanding how to measure pulmonary perfusion. However, I guess that there is an error in the statement that "the waveform correlation between the changes in the pixel values in the pulmonary and ventricular regions." The waveforms of the lung and ventricle should be opposite in direction since blood decreases in the heart when it increases in the lung. Therefore, “the waveform correlation between the inverted waveform of the lung and the waveform of the ventricle is calculated” is appropriate? Please clarify this statement.

Reply 4: Thank you for your insightful feedback. We appreciate your valuable input. As you have correctly pointed out, the waveform of the ventricular region must be the reciprocal of that in the lung field. We apologize for the inconvenience caused by the insufficient explanation in the “Materials and Methods” section. To ensure clarity, we have added the following supplementary explanation:

Changes in the text (see Page 4, line 108-110): After removing the pixel value changes corresponding to the respiratory cycle with a high-pass filter, the cross-correlation value was calculated from the degree of waveform correlation between the changes in the pixel values in the pulmonary and ventricular regions. As such, the temporal variation in pixel values of the ventricular region should be the reciprocal of that in the lung field.

Changes in the text (see Page 15, line 393-395): Pulmonary perfusion was evaluated by visualizing the degree of waveform correlation between the pixel value changes in the lung regions and periodic pixel value changes corresponding to the cardiac cycle using cross-correlation calculation processing. As such, the temporal variation in pixel values of the ventricular region should be the reciprocal of that in the lung field.

5: Page 4, Line 113:
The accuracy of contour tracing of the lungs can greatly impact the results. Please provide information on whether the tracing was performed automatically or manually and discuss the reproducibility of the measurements.

Reply 5: When conducting volumetry using CT, initially, the extraction and separation of the entire lungs or lung lobes were performed automatically. If modifications were deemed necessary upon confirmation by two or more observers, appropriate boundaries were discussed, determined, and manually retraced. Measurements were carried out following these procedures, and we assessed that there were no significant concerns regarding the reproducibility of measurements.

Changes in the text (see Page 5, line 131): The separation of lung lobes was initiated with automated tracing, the appropriate areas were manually retraced to ensure accuracy. Two or more observers were present to monitor and indicate if modifications were necessary.

6: DCR is based on changes in X-ray translucency. Therefore, it is important to consider how post-surgical metals and opacities such as atelectasis and surgical scars could obscure these changes and affect the pixel value changes in the lung. How did the authors address this issue?

Reply 6: In our study, the evaluation of blood flow using DCR was conducted by assessing the inverse correlation between waveform changes in the pixel values within the lung region and those of the left ventricular ROI, as outlined in the “Materials and Methods” section. As a result, areas with no pixel value changes, such as regions affected by postsurgical metals or those presenting as opacities, such as atelectasis and surgical scars, are inferred to lack blood flow. In addition, artifacts may occur around the metal (within a 10-pixel radius), and there is a possibility of locally increased signal values. Although the impact of overlapping structures is naturally considered, it is important to note that the inherent limitations of DCR's two-dimensional assessments are recognized.

All DCR and CT were performed on the same day?

Reply 6: Regarding postoperative imaging, we were able to perform chest CT scans and DCR on the same day. In the preoperative phase, DCR scans were performed the day before surgery. However, with respect to chest CT scans, while we utilized data from scans taken within 2 weeks before surgery for analysis in many cases, for cases in which CT scans were already performed before they were referred to our department, we allowed scans taken within 1 month before surgery, as long as no clinically significant episodes had occurred. If it is advisable to include this explanation in the manuscript, we have made the necessary additions based on your guidance.

7: Page 6, Line 192:
What does "V 3" indicate? Please provide an explanation.

Reply 7: Thank you for your valuable comments and suggestions. The reference to "(V3)" was indeed a typographical error; it should have been depicted as "Table 3." We sincerely apologize for any inconvenience this may have caused. The necessary corrections have been made.

Changes in the text (see Page 6, line 192): (Table 3)

8: Figure 5:
Parameters should be presented with error bars, similar to other figures, to provide a clearer representation of the data and its variability.

Thank you for your valuable suggestion. We have considered adding error bars to the figures as you suggested; however, due to concerns about the potential cluttering of the figures, we have opted to present the data in a supplemental table instead (Supplemental Table 3).

Changes in the text (see Page 7, line 196): (Figure 5) → (Figure 5, supplemental Table 3)

Supplemental Table 3. Temporal evolution of ELW and FLV change rates in the residual left lower lobe following left upper lobectomy.

	Preoperative	3POM	6POM	12POM
RT_ELW	1.000±0.000	1.056±0.075	1.038±0.051	1.042±0.054
LL_ELW	1.000±0.000	1.273±0.175	1.318±0.213	1.318±0.213
RT_FLV	1.000±0.000	1.060±0.075	1.053±0.072	1.071±0.095
LL_FLV	1.000±0.000	1.300±0.332	1.400±0.397	1.447±0.457

ELW, estimated lung weight; FLV, functional lung volume; LL, lower lobectomy; RT, right lung.