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## Peer Review File

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### Reviewer A

The authors submitted their manuscript untitled: “Right middle pulmonary vein classification by 3D-CT reconstruction and its clinical significance”.

They aimed to assess the anatomy of the right superior pulmonary vein anatomy, focusing on the middle lobe vein in 608 patients undergoing surgery with anatomical lung resection. They used ct scan and 3D reconstruction.

My comments are below:

1. The manuscript needs an English revision. There are several grammatical errors and typos.

Reply1: The article has been polished by an English professional.

Change in the text: Please refer to the red modification record in the article for details.

2. References in the manuscript are not presented according to authors guidelines.

Reply2: The references have been modified according to the specification.

Change in the text: Please refer to the index and reference list in the article.

3. I disagree with the assumption on the sentence lines 85-86 “However, there are few articles about the types of venous return in the right middle lobe (RML)”. I suggest considering the following published articles, with among other the following:

- Gokhan A, Elvan D, Adnan A, et al. Right top pulmonary vein: evaluation with 64 section multidetector computed tomography. *Eur J Radiol.* 2008; 67(2): 300–303.

- Rajeshwari MS, Ranganath P. Variations in draining patterns of right pulmonary veins at the hilum and an anatomical classification. *ISRN Pulmonology.* 2012; 2012: 1–4.

- Fourdrain A, De Dominicis F, Bensussan M, Iquille J, Lafitte S, Michel D, Berna P.

Three-dimensional computed tomography angiography of the pulmonary veins and their anatomical variations: involvement in video-assisted thoracoscopic surgery-lobectomy for lung cancer. *Folia Morphol (Warsz).* 2017;76(3):388-393.

Please comment, and at least compare your findings with these studies results.

Reply 3: Although previous studies have addressed the dissection and variations of pulmonary veins (错误!未找到引用源。 , 错误!未找到引用源。 , 错误!未找到引用源。 ), the incorporation of 3D-CT reconstruction techniques has led to a deeper understanding of pulmonary vein anatomy and variations. In this study, with the assisted by 3D-CT reconstruction technology of IQQA, it was discovered that there were 4 main types of the RML pulmonary venous return, 407 cases (66.94% of this study) of the central vein type, which was higher than that described in the article by Rajeshwari MS(53.8%) (错误!未找到引用源。 ), 123 (20.23%) of the isolated vein type was similar to 26.9% described by Rajeshwari MS (错误!未找到引用源。 ), 11 (1.81%) of the basal vein type in the present study, which was present at a significantly lower

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frequency than in previous studies (Rajeshwari MS 11.53%([错误!未找到引用源。](#))), and 67 (11.02% of this study) of the combination vein type.

Changes in the text: See line 56-59 and line 237-245.

4. Title of the study is about clinical significance of right PV classification following 3DCT reconstruction. What clinical relevance authors are referring to? Knowledge of already existing variation? Or impact of a preoperative assessment of a RML pulmonary vein variation for intraoperative dissection, in routine clinical practice? Please comment on that.

Reply4: Guided by 3D-CT reconstruction technology, thoracic surgeons gain a thorough understanding of the anatomy of the right middle pulmonary vein in patients preoperatively, enabling them to assess the type of venous return, reduce or avoid the intraoperative leakage or mistargeting of veins, and minimize associated surgical complexities. In real-world surgery, the type of right middle lobe venous return can be complex and varied, potentially causing interference during intraoperative targeting of disconnected veins, especially in cases of thoracic adhesion and underdeveloped lung fissure. Therefore, preoperative understanding of the type of right middle lobe venous return is more important.

Changes in the text: See line258-265.

5. Did authors experienced complication related to RML dissection in their series of 608 patients (RML infarction, RML vein thrombosis, ligation of adjacent vein...)?

Reply5: The 608 patients in this study had undergone 3DCT reconstruction preoperatively, and no significant related complications occurred intraoperatively and postoperatively.

6. Author described the varying patterns of the RML vein when draining in the left atrium. However, the anatomical variation of the pulmonary veins may also interest the path of the vessels and not only their draining in the left atrium. Also, pulmonary vein anatomy may be complex because of the crossing of other elements of interest (pulmonary artery bronchus). Lastly, RML vein may drain in the superior cava itself. Did the authors assessed any of these variations (other than the drainage in left atrium itself)? Please comment on that.

Reply6: Sometimes the pulmonary vein return route to the heart may have other rare return routes due to the influence of the pulmonary artery bronchus. The return of the right middle pulmonary vein into the heart via the superior vena cava (SVC) is mentioned in the articles by Demir E and Najm H K.

Change in the text: See line303-307.

## **Reviewer B**

The authors perform a comprehensive analysis of the different patterns of the right middle vein. As correctly pointed out by the authors the use of 3D modelling before lung surgery is fundamental in the definition of the anatomy and of the surgical planning, particularly in case of sublobar resections.

There are some minor spelling mistakes and in the references in the introduction that should be edited.

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Reply: The article has been polished by an English professional.

Change in the text: Please refer to the red modification record in the article for details.

### **Reviewer C**

This manuscript is interesting research regarding right middle pulmonary vein classification by 3D-CT reconstruction and its clinical significance. However, there is a crucial issue in this manuscript to be accepted for JTD.

Similar manuscript had been reported in other journal about analysis of variation in bronchovascular pattern of the right middle lobe of the lung using the three-dimensional CT angiography and bronchography (Gen Thorac Cardiovasc Surg 2017, 65:343-349). So, this manuscript is low priority.

Reply: Although Nagashima T's literature (26) details the classification of the middle lobe vein of the right lung, it solely focuses on the simplistic categorization of refluxing into the middle lobe vein based on the number of vessels in the gyrus. In our study, we not only graded refluxing vessels in the right pulmonary vein but also incorporated various route combinations of these vessels. The comprehensive classification of four major types of right middle lobe venous return in this study will empower clinicians with a deeper understanding of the anatomy of the right middle lobe vein.

Change in the text: See line 228-235.

### **Reviewer D**

Knowledge of segmental anatomy of pulmonary veins is very important. You have disclosed the incidences of variations in your patient population. Yet there is a lack of clinical discussion. You must include statistical data to support that preoperative evaluation of the vein anatomy benefits the surgical procedure. Otherwise the study lacks clinical importance.

Reply: This article is a descriptive study on the typing of the right middle lobe vein, and the lack of clinical data on complications is a deficiency of this study, which is supplemented in the Limitation section. But the results of this study provide important anatomical structures for the development of anatomic right lung surgery, which is clinically meaningful for preoperative precision specification. Meanwhile, this study provides a solid foundation for the subsequent development of relevant multicenter randomized controlled clinical trials.

### **Reviewer E**

The reviewer is honored to review an article about the anatomy of right middle pulmonary vein using a 3D-CT reconstruction. This paper contained more than 600 patients with right middle pulmonary veins, which were quite enough number to perform the analysis of this kind.

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However, this paper, unfortunately, did not show any clinical significance despite several cases of very rare variations of middle pulmonary veins. In this sense, the reviewer would suggest to change the title or rewrite the paper with more data about its clinical significance. Furthermore, there are so many English grammatical errors. So, the reviewer also would suggest that the authors should ask a professional editor to edit the manuscript again.

Change in the text: See line 316-317.

Major points

1) The authors identified 4 major patterns of venous return, but they provided 8 subfigures in Figure 2. The reviewer would suggest only 4 subfigures, which would avoid the misunderstanding by the potential readers.

Reply1: Figure 2 has been modified as you suggested.

Change in the text: Figure 2-revised.

2) Especially in the first paragraph of the Discussion section, there are so many typos and grammatical errors. In the first sentence, “trachea” should be “bronchus”. “to outperform lung surgeries s safely” should be “to perform lung surgeries safely”? (line 228-229) “from the 3D level to the 3D level”? (line 231).

Reply 2: The article has been polished by an English professional.

Change in the text: Please refer to the red modification record in the article for details.

## Reviewer F

### 1. Reference

a. The authors mentioned “**studies...**”, while only one reference was cited. Change “Studies” to “A study” or add more citations. Please revise. Please number references consecutively in the order in which they are first mentioned in the text.

*“which was present at a significantly lower frequency than in previous **studies** (Rajeshwari MS 11.53%(13)),”*

Reply a : We have change studies into stduy.

Change in the text: See line 246.

b. Revise the reference list with EndNote (if possible). In the reference list, list all authors (order: last name + first name (initial)), but **if the number exceeds three, give three followed by “et al.”**, and names of journals should be abbreviated in the style used in PubMed. There should no period/comma between the journal name and the year.

**Format should be:** Author 1, Author 2, Author 3, **et al.** Title of the article. Journal Abbreviation name **Year**; Volume: Page numbers.

*Example ( $\leq 3$  authors):*

[e.g. Resnick MJ, Bassett JC, Clark PE. Management of superficial and muscle-invasive urothelial cancers of the bladder. *Curr Opin Oncol* 2013;25:281-8.];

*Example ( $> 3$  authors):*

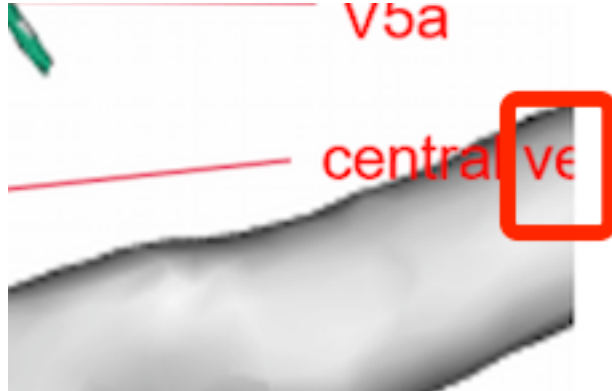
[e.g. Park S, Jee SH, Shin HR, et al. Attributable fraction of tobacco smoking on cancer using population-based nationwide cancer incidence and mortality data in Korea. *BMC Cancer*

2014;14:406-17.]

Reply b : The references have been modified according to the suggested format.

Change in the text:See the reference section.

**2. A word is covered in figure 3C. Please revise.**



Reply : We revised figure 3 as suggested.

Change in the text :See figure 3-revised.

**3. Figure 4E**

It seems that contents are missing here.



Reply : We revised figure 4 as suggested.

Change in the text :See figure 4-revised.

**4. Table 3**

a. Please check if data are missing. If not, please fill “-”.

One branch type <sup>↵</sup>	191 <sup>↵</sup>	27.30% <sup>↵</sup>	46.93% <sup>↵</sup>	↵ <sup>↵</sup>
V4+5 <sup>↵</sup>	191 <sup>↵</sup>	27.30% <sup>↵</sup>	46.93% <sup>↵</sup>	↵ <sup>↵</sup>
Two-branch type <sup>↵</sup>	165 <sup>↵</sup>	27.14% <sup>↵</sup>	40.54% <sup>↵</sup>	↵ <sup>↵</sup>
V4,V5 <sup>↵</sup>	62 <sup>↵</sup>	10.20% <sup>↵</sup>	15.23% <sup>↵</sup>	37.58% <sup>↵</sup>
V4+V5b,V5a <sup>↵</sup>	52 <sup>↵</sup>	8.55% <sup>↵</sup>	12.78% <sup>↵</sup>	31.52% <sup>↵</sup>
V4a, V4b + V5 <sup>↵</sup>	33 <sup>↵</sup>	5.43% <sup>↵</sup>	8.11% <sup>↵</sup>	20.00% <sup>↵</sup>

Reply a:We revised table3 as suggested

Change in the text:See table3-revised.

b. It seems that these data are repeated. Please check and revise.

One branch type	191	27.30%	46.93%
V4+5	191	27.30%	46.93%

Reply b : Because there is only one subtype (V4+5) for this one branch type, the total data and subtype data are the same.

### 5. Table 3

The (%) (red box) can be deleted. Please check and revise.

Table 3-revised Subtypes vein of the central vein type

Subtypes vein of the central vein type (n=407)	Number of cases	Proportion of the study (%)	Proportion of the central vein type (%)	Proportion of two/three-branch type (%)
One branch type	191	27.30%	46.93%	-
V4+5	191	27.30%	46.93%	-
Two-branch type	165	27.14%	40.54%	-
V4,V5	62	10.20%	15.23%	37.58%
V4+V5b,V5a	52	8.55%	12.78%	31.52%
V4a,V4b+V5	33	5.43%	8.11%	20.00%
V4a+5a,V4b+5b	18	2.96%	4.42%	10.91%
Three-branch type	43	7.07%	10.57%	-
V4,V5a,V5b	6	0.99%	1.47%	13.95%
V4a,V4b+5b,V5a	37	6.09%	9.09%	86.05%
Over three-branch type	8	1.32%	1.97%	-
V4a,V4b,V5a,V5b	8	1.32%	1.97%	-

Reply: We have revised the table 3 according to suggestions.

Change in the text : See in the table 3-revised.

### 6. Table 4

The (%) (red box) can be deleted. Please check and revise.

Table 4 Subtypes vein of the combination vein type

Subtypes vein of the combination vein type (n=67)	Number of cases (patients)	Proportion of the study (%)	Proportion of the combination vein type (%)
Type A	37	6.09%	55.22%
Type B	7	1.15%	10.45%
Type C	21	3.45%	31.34%
Type D	2	0.33%	2.99%

Type A: Two or more branching veins flow back to the central vein and LA; Type B: Two or more branch veins flowing back into the basal vein and LA, respectively; Type C: Two or more branch veins flowing back into the basal vein and the central vein, respectively; Type D: the irregular random combination of the middle vein and other non-middle veins flowing back into the LA through various ways. LA, left atrium.

Reply: We have revised the table 4 according to suggestions.

Change in the text : See in the table4-revised.