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**Review Comments**

Comment 1: SLNs, NIRF, ICG - there is no decoding in the text, only in the abstract.

Reply 1: We have decoded SLNs, NIRF, ICG in the text. Please check the revised manuscript.

Comment 2: The text of the article does not indicate a method for searching for articles. Not all significant articles are indicated.

Reply 2: Electronic databases were systematically searched via MEDLINE/PubMed from inception to 1 August 2019. The following medical subject headings were searched: “indocyanine green (or ICG)” and “thoracic surgery”, “indocyanine green (or ICG)” and “pulmonary nodule”, “indocyanine green (or ICG)” and “pulmonary segment” , “indocyanine green (or ICG)” and “gastroesophageal anastomosis” , “indocyanine green (or ICG)” and “pulmonary bulla”, “indocyanine green (or ICG)” and “thoracic duct” , “indocyanine green (or ICG)” and “sentinel lymph node” .We almost select the latest 5-years literatures about ICG NIRF technology used in thoracic surgery to guarantee the advancement of our review paper. According to the reviewers, we add most significant articles in our manuscript.

Comment 3: ICG was initially used as a simple dye, not a fluorescent agent. And in

23 some of the cited works, a very large dose of ICG is used, which allows visualizing the  
24 accumulation of the drug without any fluorescence. This should be noted especially.  
25 Pulmonary nodule localization is a moot point. Better for liver cancer metastases, and  
26 for primary cancer is bad. Very large doses up to 5 mg/kg (300 mg).

27 Reply 3: According to toxicity studies, 5.0 mg/kg ICG intravenous injection was quite  
28 safe and permissible. (Fox IJ, Wood EH. Indocyanine green: physical and physiologic  
29 properties. Mayo Clin Proc. 1960; 35: 732-744.)

30 In He's study (He K, Zhou J, Yang F, et al. Near-infrared Intraoperative Imaging of  
31 Thoracic Sympathetic Nerves: From Preclinical Study to Clinical Trial. Theranostics  
32 2018; 8: 304-13.), for patients' safety reasons, they referred to several studies in tumor  
33 identification for pulmonary nodules and brain tumors and then chose the ICG  
34 concentration of 5 mg/kg. These studies were:

35 Judy RP, Keating JJ, Dejesus EM, Jiang JX, Okusanya OT, Nie S, et al. Quantification  
36 of tumor fluorescence during intraoperative optical cancer imaging. Sci Rep-Uk. 2015;  
37 5: 16208.

38 Lee JY, Pierce JT, Thawani JP, Zeh R, Nie S, Martinezlage M, et al. Near-infrared  
39 fluorescent image-guided surgery for intracranial meningioma. J Neurosurg. 2017: 1.

40 Lee JY, Thawani JP, Pierce J, Zeh R, Martinez-Lage M, Chanin M, et al. Intraoperative  
41 Near-Infrared Optical Imaging Can Localize Gadolinium-Enhancing Gliomas During  
42 Surgery. Neurosurgery. 2016; 79: 856.

43 Okusanya OT, Holt D, Heitjan D, Deshpande C, Venegas O, Jiang J, et al. Intraoperative  
44 near-infrared imaging can identify pulmonary nodules. Ann Thorac Surg. 2014; 98:

45 1223-30.

46 Zeh R, Sheikh S, Xia L, Pierce J, Newton A, Predina J, et al. The second window ICG  
47 technique demonstrates a broad plateau period for near infrared fluorescence tumor  
48 contrast in glioblastoma. Plos One. 2017; 12: e0182034.

49

50 Comment 4: The authors do not analyze the dose of injected ICG.

51 Reply 4: We have analyzed the dose of injected ICG in some sections, now we are  
52 adding the dose of injected ICG in other sections, please check in the manuscript.

53

54 Comment 5: Describing the shortcomings in determining the intersegmentary boundary  
55 when performing a segmentectomy, the author does not quite clearly describe the  
56 methodology for determining the intersegmentary boundary using fluorescence. The  
57 following is a description of the difference when using the method of one and two  
58 wavelengths. At the same time, it is not clear what the difference in methods is. Again,  
59 very large doses of 3.0 mg / kg -200 mg.

60 Reply 5: We added the methodology for determining the intersegmentary boundary  
61 using fluorescence in this section. In Kasai's study, although the dose of ICG was very  
62 large, there were no perioperative or postoperative complications caused by infrared  
63 thoracoscopy with ICG when using either the 2-wavelength method or the 1-  
64 wavelength method.

65 Clinical application of ICG in determining the intersegmentary boundary can be divided  
66 into positive imaging and negative imaging. The positive imaging is ligating the

67 proximal artery of the target pulmonary segment and injecting ICG into the distal artery  
68 of the target pulmonary segment, then the target pulmonary segment shows  
69 fluorescence. Negative imaging is ligating the proximal artery of the target pulmonary  
70 segment and then injecting ICG into the central vein, so the lung tissue outside the target  
71 pulmonary segment shows fluorescence.

72 Kasai et al. ligated the dominant pulmonary artery and then observed the lung using an  
73 infrared thoracoscope after indocyanine green (ICG) intravenous injection. The 2-  
74 wavelength infrared thoracoscope irradiation and detection were conducted at 940 and  
75 805 nm, respectively, and the images were projected based on the difference of the two  
76 reflected wavelengths. ICG absorbs 805 nm wavelength light, and the ICG distribution  
77 area appears blue against a white background. On the other hand, the 1-wavelength  
78 infrared thoracoscope irradiation and detection were conducted at 780 and 830 nm,  
79 respectively. The area stained with ICG shows fluorescence.

80

81 Comment 6: "Tracing sentinel lymph nodes - the choice of adjuvant therapy". Not this,  
82 but the need for lymph node dissection. 1 ml of ICG which concentration?

83 Reply 6: We have revised this section according to the comment. Sentinel lymph nodes  
84 (SLNs) dissection has become an integral part of the scale of LNs dissection for solid  
85 malignancies (such as breast cancer, malignant melanoma, etc.). Gilmore et al. assessed  
86 the safety and feasibility of NIR imaging using ICG (3.8 µg) for SLN identification in  
87 NSCLC in 29 patients. After 5 to 20 minutes, the lymph nodes showed successfully.

88

89 Comment 7: The feasibility of determining bullas and nerve structures using green  
90 indocyanin is debatable.

91 Reply 7: Not more studies talk about the application of ICG in determining bullas and  
92 nerve structures, but these reports are in some famous journals (such as Ann Thorac  
93 Surg, J Thorac Cardiovasc Surg, Journal of Cardiothoracic Surgery) and showing ICG  
94 real-time fluorescein imaging technology can do helpful in these sections from animal  
95 model to the clinic. So we think using ICG to determine bullas and nerve structures is  
96 feasible.

97

98 Comment 8: Hardware features are not discussed in any way.

99 Reply 8: We add hardware features in the “Introduction”.

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101 Comment 9: Are there any drawbacks to this technique?

102 Reply 9: There are some drawbacks of this technique. We have discussed in the  
103 manuscript.

104

105 Comment 10: The article describes many positive results of using indocyanin green,  
106 but issues requiring improvement are not raised for discussion. Perhaps the article lacks  
107 illustrative material. There are other articles that describe some sections more broadly.

108 Reply 10: Our article describes the application of indocyanin green in some sections,  
109 and we have added some issues of this technique in the manuscript.

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