

Reviewer A:

Comment: Please proofread the English text properly.

Reply: Thank you for this suggestion. The English text has been proofread.

Reviewer B:

Comment 1: What can one say, really, about the experience of the Shanghai Chest Hospital? Their numbers redefine the whole concept of « high volume » and in many ways set the bar for thoracic surgery. I think that the paper is publishable as is, but I did have a few comments below that the authors may wish to address, at their discretion and that of the editors.

What I would be interested in are some of the logistics that make it possible for a hospital to function at such a high level,

I very much appreciate the authors' comments on sublobar resections gradually replacing lobectomy as the primary form of lung resection for cancer. Perhaps the authors may include a few words on their ERAS protocol, as well as their experience with outpatient lung resections?

Reply 1: Thank you very much. The ERAS protocol is a multidisciplinary program with all facets of perioperative care based on our past experiences and major ERAS society guidelines. As for the experience of outpatient lung resection, actually we did not perform lung resection in the outpatient department.

Comment 2: I would be interested to know a bit more about the covid restrictions that were implemented during the height of the pandemic, and the exact time periods concerned. To my knowledge, there was no CT-screening for COVID in North America; how did that work? It wasn't clear to me from the text if there was a distinct CT-screening program for lung cancer per-se; was that the case?

Reply 2: Thank you for this good suggestion. There was also no CT-screening for COVID-19 in China, but each patient should complete the chest CT scan before hospitalization during the year of 2020 and 2021. That's actually contributing to the increase of early-stage lung cancer.

Comment 3: When mentioning their improving results because of cutting edge techniques, the authors may wish to reference their most salient recent contributions.

Reply 3: Thank you very much for your suggestion.

Comment 4: Incidentally, Figure 8 came before Figure 7 in the text.

Reply 4: Thank you for this kind suggestion. The Figure 8 and Figure 7 have been exchanged.

Comment 5: Many thanks for the opportunity to review this very informative and inspiring paper!

Reply 5: Thank you very much!

Reviewer C:

Commen: Please verify the correct quantity of cases, do you actually mean 20,000 cases performed per year in overall thoracic surgery just at Shanghai Chest?

Just wanted to verify that those numbers are what is meant by the authors? I have never seen volumes like that ever, so just want to make sure.

Congratulations on all your hard work and results.

Reply : Thank you very much for this question. I am sure that all the quantity of surgical cases was verified and true.

Reviewer D:

Comment: I would like to congratulate the authors with their manuscript entitled “Annual report of thoracic surgery service at Shanghai Chest Hospital in 2021”. The manuscript is well written and provides an excellent and complete overview of the annual case load of one of the largest and rapidly expanding thoracic surgical services worldwide. I have no further comments, other than to congratulate the authors with their impressive work!

Reply: Thank you very much!

Reviewer E:

Comment 1: I want to congratulate authors with such extraordinary results! Could authors please comment on short- and long-term morbidity rate (percentage) and types of complications, as well as reasons of mortality in each groups?

Reply 1: Thank you very much for your suggestions. The in-hospital morbidity rate of lung resection was 3.6% (643/17829), and the reason for in-hospital mortality (one case) was pulmonary infection and respiratory failure. The in-hospital morbidity rate of esophageal resection was 14.1% (157/1113), and the reasons for in-hospital mortality (three cases) included cardiac failure, postoperative bleeding and infection. The in-hospital morbidity rate

of mediastinal, tracheal and chest wall resection was 9.6% (103/1077), 13.3% (11/83), 5.3% (4/76), and no in-hospital morbidity occurred. Three patients died after lung transplantation for pulmonary infection and respiratory failure.

Comment 2: Lines 254-257: Do you have a routine practice to test symptomatic patients/staff members (even with minor symptoms)? And if yes, all 100% of these tests were negative for COVID?

Reply 2: Thank you. There was no routine practice.

Reviewer F:

Comment 1: This is an interesting report and I've enjoyed reading it. I just have a few comments on it, and I thank the authors for reading and considering it.

In your text you are commenting that year's 2022 surgical outcomes are compared to previous years and in tables and figures you are clearly showing a progressive decrease in hospital mortality and LOS. In general I agree with your statements but I believe your text would be enriched if you state that both case selection criteria for surgery and patient's status for hospital discharge were the same all along the study period. If not, it could be hypothesised that just patients in good performance status were operated in the last year.

Reply 1: Thank you very much. Just as you said, the selection criteria for surgery and patient's status for hospital discharge were the same in the year of 2021 compared with the previous years.

Comment 2: From the point of view of clinical epidemiology, differences or decreases in the rates of outcomes or the length of stay are only demonstrated if adequate statistical tests are included in the analysis. I fully understand that a statistical analysis is not the aim of your report but a short comment on this limitation of the study would be welcome at the discussion section.

Finally, hospital mortality is not a 100% valid surrogate of the risk of surgical procedures. Instead, 30 and 90-day mortality should be mentioned. If you cannot have an easy access to those, just mention that limitation somewhere in the discussion section.

Reply 2: Thank you very much for your suggestions. The limitations have been added in the revised manuscript.

Change 2: line 294-298.

Reviewer G:

Comment: This report showed an impressive activity and results achieved during 1 year time in the Shanghai Chest Hospital.

Congratulations!

Reply: Thank you very much!

Reviewer H:

This is an annual report at Shanghai Chest Hospital.

Comment 1: Spacing is inappropriate and hard to read. This manuscript should be proofread.

Reply 1: Thank you. The manuscript has been proofread for inappropriate spacing.

Comment 2: Some similar descriptions are duplicated in Introduction, Result, and Discussion. For examples: COVID-19, huge cases in China, some data

Reply 2: Thank you for your kind advice. The similar descriptions were revised.

Comment 3: The number of surgeries has increased by more than 10,000 since 2016, and the proportion of MIS has also increased. Please describe what you are careful about in order to provide medical care safely, such as the number of doctors and nurses, keeping skills level, nurses, overwork and education.

Reply 3: Thank you very much. In order to provide medical care safely, the most significant thing is to keep highly developed surgical skills and outstanding work of peri-operative care. In addition, the adequate number of doctors and nurses are also important.

Comment 3: Please describe the surgical approach in detail. RATS methods, VATS Uniportal or Multiportal?

Reply 4: Thank you for this suggestion. RATS included three-portal and four-portal RATS. VATS included uniportal, two-portal, three-portal VATS.

Reviewer I:

This is a report from one of the highest volume centers. However, this manuscript has many problems.

Comment 1: Spaces between words are missing in many sentences. So this manuscript does not constitute a research paper. It may be rejected for other journals, but may be acceptable to SHC.

Reply 1: Thank you. The manuscript has been proofread for inappropriate spacing.

Comment 2: Please show the definition about minimally invasive surgery. Uniportal VATS or not?

Reply 2: Thank you very much. The minimally invasive surgery included VATS and RATS. VATS included uniportal, two-portal, three-portal VATS.

Reviewer J:

Comment 1: I read with great interest the 2021 report of the Department of Thoracic Surgery at Shanghai Chest Hospital. The mind-boggling volume of operations alone stand unique in the world, and the professional experience of the team of surgeons at this famous institution within their meticulous organization of each individual day remains a remarkable achievement.

May I humbly suggest a few modifications, merely to reveal the department's many accomplishments in greater detail and contrast:

The introduction alludes to the impact of COVID on every-day operations without explaining its true impact. How did the institution reorganize its service in response to permit not just maintaining, but expanding the number of procedures?

Reply 1: Thank you for your question. In order to prevent potential COVID infection, multiple measures were undertaken and adjusted according to the situation in Shanghai. Chest CT and routine blood examination (white blood cell count) as well as a 14-day quarantine were required for every patient before thoracic operation to rule out COVID infection. After admission, each patient was required to put on face mask and keep social distance. Surgeries for patients with small or pure GGO lesions who were considered at low risk were postponed. As for protection for medical staffs, face masks were a must for medical staff inside the hospital. Isolation gowns and eye protections were encouraged during invasive examinations and surgical procedures.

Comment 2: The report mentions CT screening not just for lung cancer, but for COVID. Does all screening occur external to the institution or within its radiology services? If COVID screening is a major source of lung nodule referral, do patients so identified undergo diagnostic resections or are biopsies performed before resection (these presumably would be considered low-risk for lung cancer)? Could the authors find a simple expression for the relative proportions of screening for lung cancer and COVID?

Reply 2: Thank you for your good suggestion. In fact, each patient should complete the chest CT scan before hospitalization during the year of 2020 and 2021, but not CT screening for COVID.

Comment 3: From my own visit, I recall that CT guided needle biopsies were done within the department. Does the increasing volume for limited resection and smaller nodules affect the volume of CT guided needle biopsy?

Reply 3: Thank you for this kind suggestion. In the thoracic team of Shanghai Chest Hospital, the CT-guided needle biopsies were rarely done for small-size lung nodules. Therefore, the increasing volume of limited resection and lung nodules did not affect the volume of CT-guided

needle biopsy.

Comment 4: The Division of Esophageal Surgery is separate from Pulmonary Surgery. Do thoracic surgeons perform esophageal resections, or are these abdominal surgeons? Is there an overlap - do some surgeons hold joint appointments in pulmonary and esophageal surgery or are the fields entirely separate?

Reply 4: Thank you for this good question. The Division of Esophageal Surgery is a subspecialty of the Department of Thoracic Surgery. The esophageal surgeries were performed by those thoracic surgeons.

Comment 5: The role of the Department as an educational institution is not explained, but must be remarkable in itself. Why is education not mentioned in the annual report? How many thoracic surgeons are educated within any given year? How long do trainees stay? What is the proportion of thoracic procedures, lobectomy and other, that is performed by trainees?

Numbers are important, particularly those documenting improvement in quality and preoperative risk. However, that stature of the institution rests on education and research. These areas deserve to be mentioned.

Reply 5: Thank you very much for your advice. I totally agree with your suggestion. Education and research are also important for the development of the Department of Thoracic Surgery apart from surgical volume. We will make an improvement in the upcoming annual report.

Reviewer K:

Comment: Congratulations for your results. The number of cases is just incredible.

My minor comment is that the manuscript should be checked in detail. There are many syntax error with many words together. Please correct. Otherwise nothing to add.

Reply: Thank you very much for this advice. The manuscript has been corrected.

Reviewer L:

Dear authors,

It has been a real pleasure reading this excellent and comprehensive report of your annual activity. Your achievements are impressive. Despite this, I have suggested some modifications that I think can improve the quality of the manuscript before recommending it for publications. Please, received my congratulations for such and impressive work.

Comments for improvement:

Comment 1: English needs some review: there are minor problems both in text and figures.

Reply 1: Thank you very much. English has been revised.

Comment 2: I would suggest adding two more keywords to the current list. Remember that words will increase the chance of localizing the paper in the future when performing search strategies.

Reply 2: Thank you very much for your suggestion. Another two keywords has been added into the revised manuscript.

Change: line 60-61.

Comment 3: Due to the no normal distribution of the LOS, I suggest amending the data and present the median length of stay and the IQR range instead of the median or average LOS as it is presented at the current manuscript. Please, amend this data in the figures 9,12 and 14

Reply 3: Thank you very much. The median LOS and the IQ Range might be a better choice for the statistical comparison between two groups when non-normal distribution parameter appears. However, the average of LOS here only tried to indicate the general tendency of the change of LOS in the past years. No statistical analysis and comparison were needed.

Comment 4: According to Figure number 2 and 17A, there is a substantial decrease of case volume in February in both years. Is there any explanation for it?

Reply 4: Thank you very much. Usually, Chinese New Year is in February, which will be a one-week holiday. Besides, February itself is only 28 days. Therefore, a decrease of surgical volume in February is reasonable and predictable.

Comment 5: Figure 2 and 17A are equal. I suggest deleting figure 2. It makes more sense keeping figure 17A along figure 17B and 17C

Reply 5: Thank you very much. Figure 2 shows the total surgical volume of each month in 2021 and Figure 17A presents the volume of pulmonary surgery each month in 2021. Therefore, these figures are different.

Comment 6: Despite having a very low mortality rate, figure 3 displays a 0.30 mortality rate in 2018. Any specific reason? Maybe it is worth it commenting on this figure.

Reply 6: Thank you very much. In our aspect of view, there was no specific reason for this phenomenon.

Comment 7: In my opinion, figures 6 and 7 are a little bit repetitive. I would suggest deleting figure 6 because data is on the text and keeping only figure 7. The relevant issue is the rates of lobectomy and wedge and anatomical segmentectomies rather and its evolution along the years.

Reply 7: Thank you. Figure 6 shows the types of pulmonary resections in the year of 2021. And Figure 7 presents the surgical volume of segmentectomy in the past 11 years. These two

figures are different.

Comment 8: It would be interesting to see a comparative distribution of NSCLC stages between 2019, 2020 and 2021 to further evaluate the impact of COVID pandemic.

Reply 8: Thank you very much for advising such a good suggestion. However, the stage data is still immature. This data will be added into upcoming annual report.

Comment 9: I suggest a change in the title of the section “tracheal, chest wall and lung transplantation”. It is about the airway experience presented. According to the type of procedures included (figure 16), in my opinion the title of the section should be “airway surgery, chest wall and lung transplantation”.

Reply 9: Thank you very much. I appreciated for your suggestion. However, Tracheal Surgery is the title of the Division of the Department of Thoracic Surgery.

Comment 10: In your discussion, you mentioned there is another hospital performing more than 20,000 patients/year. Is it possible some type of comparative analysis between the two hospitals? Maybe it would be worthily mentioning some data from the other hospital.

Reply 10: Thank you for your advice. We would like to make a comparative analysis, but there was no accessible data from this hospital.