

## Professor Takashi Suda: we should not compromise the safety and precision of a thoracic surgery

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Being continuously explored, practiced, and innovated during the past few years, single port video-assisted thoracic surgery (VATS) is no longer a new technique to the world. Under the joint-efforts of experts worldwide, the technique achieves great improvements and is getting more and more popular today. During 26<sup>th</sup>-27<sup>th</sup> March 2015, top experts in area of thoracic surgery from all over the world gather in Hong Kong, to attend the 3<sup>rd</sup> Asian single port VATS symposium & live surgery, sharing the latest progress of single port VATS. During the meeting, it is our great pleasure to meet Prof. Takashi Suda (*Figure 1*), a pioneer of robotic surgery for lung cancer from Department of Cardiothoracic Surgery, Fujita Health University Hospital in Japan. We are of great honor to have Prof. Suda accept our interview, sharing his valued viewpoints on single port VATS.

**ATM:** *You have an impressive presentation on “Infrasternal single port thymectomy & subxiphoid bilateral lung resection”. Would you like to summarize some key points of your presentation today?*

**Dr. Suda:** Thoracoscopic lung resection and thymectomy, including single-port VATS lobectomy, are conventionally performed using a lateral intercostal approach. However, surgical injury to the intercostal space causes intercostal nerve paralysis or neuralgia at a rate of 100%, which may last for life as post-thoracotomy pain syndrome. Because I doubt whether the lateral intercostal approach is actually minimally invasive, I have been performing thymectomy and bilateral lung resection since 2011 using an approach via the subxiphoid incision where no intercostal nerves are present. This may be the most minimally invasive approach for patients undergoing thoracic surgery because of mild pain, no intercostal nerve paralysis, and excellent aesthetical outcome.



**Figure 1** Professor Takashi Suda.

**ATM:** *We understand you are a pioneer of robotic surgery for lung cancer in Japan. As an expert in this area, would you like to share with us any latest progress or research? How do you see the future of the technique?*

**Dr. Suda:** In 2009, I became the first surgeon in Japan to use the da Vinci robotic system in lobectomy. Because robot-assisted surgery for lung cancer is not currently covered by the Japanese National Health Insurance System, the cost of such surgery is unfortunately expensive for patients, limiting the application of robotic surgical systems in thoracic surgery. To expedite the coverage of robot-assisted surgery for lung cancer by the national health insurance system, Japanese medical institutions performing robot-assisted surgery are currently planning a comparative clinical study of thoracoscopic surgery and the robot-assisted surgery.

One of the disadvantages of approaching from the side of the chest in thoracoscopic thymectomy including

robot-assisted surgery is the difficulty in identifying the contralateral phrenic nerve and neck region. But, as we reported today, infrasternal single-port thymectomy makes the identification of both phrenic nerves easy and ensures a sufficient operative field because the camera is inserted via the subxiphoid space. Yet, because of poor manipulability, single-port surgery should not be indicated for cases of advanced-stage tumors, such as those with pericardial infiltration. To address the problem, we developed the trans-subxiphoid robotic thymectomy method, in which the da Vinci robotic camera is inserted through a subxiphoid incision, and an additional incision is made bilaterally in the anterior intercostal space for the insertion of a port (1). Due to the good operative field and surgical manipulability, this method may be indicated for difficult surgical cases. I think this method might become the standard approach for robot-assisted thymectomy.

Single-port robotic systems are currently being developed. When these systems are introduced into clinical practice, single-port thymectomy and lobectomy will be much easier and much less invasive.

*ATM: Single port VATS has been very hot in recent years. It may be difficult/interesting along the way when transferred from three ports to single port. Would you like to share any stories that you ever encountered (challenges, setbacks, success, etc.)? What encouraged you to study on it?*

**Dr. Suda:** When performing my first infrasternal single-port thymectomy, because we did not perform CO<sub>2</sub> insufflation, both the lungs expanded toward the mediastinum, interrupting the surgery. We therefore started mediastinal CO<sub>2</sub> insufflation to displace the lungs and pericardium and to open up a large space backside of the sternum, which allowed us to resume single-port surgery via the subxiphoid. I was excited about this discovery and learned that mediastinal CO<sub>2</sub> insufflation is essential for this surgery.

At present, I perform 3-port, not single-port, VATS lobectomy for lung cancer, but I was impressed by reports and videos of live surgery presented by others today, and I am thinking of adopting it in the near future.

*ATM: How is the application of single port VATS in your department/country? What's the proportion?*

**Dr. Suda:** Single-port thymectomy is indicated as long

as tumors have not infiltrated into the pericardium or vasculatures or as long as partial resection is applicable even when tumors have invaded the lungs. Single-port VATS is used in the most cases of thymectomy for anterior mediastinal tumors and myasthenia gravis.

At present, single-port thymectomy or lobectomy for lung cancer is performed only in a very small number of institutions in Japan.

*ATM: Comparing to two & three ports VATS, what do you think are the advantages of single port? Any drawbacks? Do you agree that multiports VATS will be replaced as single port VATS develop more and more popular?*

**Dr. Suda:** This is only my opinion, but I think that certain cases of lung cancer benefit greatly from single-port lobectomy. Unlike the time when 3-port VATS was first introduced, most surgeons now agree that adequate lymph node dissection is achieved by 3-port VATS. The safety and accuracy of lymph node dissection in single-port VATS need to be investigated, but if we can show that it is possible to perform appropriate mediastinal lymph node dissection, this procedure may take the place of 3-port VATS.

*ATM: What do you think is the key to a successful single port VATS? Skills/team work/devices or...?*

**Dr. Suda:** To me, selecting proper surgical instrument, such as forceps and long scopes designed to minimize interference and devices that can be used for sealing vessels and dissection, is the key to a successful single-port VATS. In addition, single-port VATS should be performed by surgeons who are skilled in regular VATS.

*ATM: We noticed that an important goal for this year's conference is "Redefining the future of minimal invasive thoracic surgery". How do you define its future?*

**Dr. Suda:** It is difficult to define minimally invasive thoracic surgery. Does a small incision really mean minimally invasive to patients? Small wounds can cause intercostal nerve impairment. Therefore, while surgeons are satisfied with small incisions, the patients may be dissatisfied with the surgery because of pain and numbness. The area affected by intercostal nerve paralysis is smaller with 3-port than with single-port, but to assess the invasiveness of the procedure, it is important to survey

patient satisfaction and pain.

**ATM:** *In your opinion, what is the principle of minimal invasive thoracic surgery? In which way can we make efforts to practice/promote the technique?*

**Dr. Suda:** When performing thoracic surgery, we should remember not to compromise the safety and precision of surgery just because we are too concerned about minimizing surgical invasiveness. Thoracoscopic surgery should not be inferior to other open chest surgery in terms of precision. The most important purpose of surgery is to cure the disease. If you think that the use of 3-port VATS does not compromise the precision of surgery, then you can convert to single-port VATS while maintaining the same level of precision. After that, it's important for you to report the outcome using videos. When other surgeons accept the level of precision, this procedure will spread further.

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**ATM:** *Any suggestions for the young people to learn on single port VATS?*

**Dr. Suda:** It is important to learn from highly skilled instructors with sufficient experience.

**ATM:** *Thank you very much for sparing time to share your expertise with our readers!*

## Acknowledgements

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