Graduated from Medical School, and acquiring his PhD degree in the Medical Research Institute in National Taiwan University, Prof. Lee (Figure 1) is now the chief and professor of surgery in the Thoracic Surgical Division of Surgical Department in National Taiwan University Hospital. He is one of the important pioneers in the development of minimal invasive surgery in thoracic space in Asia. He possesses comprehensive understanding of both surgery development and medical environment of Taiwan. He is deeply devoted in development and education of minimally invasive thoracic surgery especially in the complex procedures including minimally invasive esophagectomy, robotic surgery or peroral endoscopic myotomy (POEM). He also actively participates in the editorial or review board in many distinguished international medical journals and has published more than 100 scientific papers. Elected as secretary in general of the thoracic society in 2013, he voices for the society to the government sector, policy makers, the patients and other healthcare stakeholders and leads the education of study for surgery in Taiwan. Due to his achievement in surgical spaces and thoracic education, he is now frequently invited for the lectures to share and to shape the future of the thoracic surgical field.

During the Shenzhen Surgical Forum held in October 2014, Prof. Jang-Ming Lee has two great lectures on robotic surgery and esophagectomy. As an experienced surgeon with profound study on pathogenesis and molecular epidemiology, how does he look at the robotic-assisted surgery? And what are his suggestions for a young surgeon about coping with the surgical complications? Let's enjoy the interview with Prof. Lee by *Journal of Thoracic Disease (JTD)* as follows.

**JTD: In your lecture on the Forum, you mentioned the robotic assisted surgery is feasible and also effective today. What are the main reasons that make you choose the robotic assisted surgery?**

**Prof. Lee:** The main reason why we choose robot is that its small ports are the most important part to provide the performance of complex procedures, and its instrumentation can be freely controlled by the surgeons because of the wrist. Usually we use our hands with our wrists and we use our wrists from our fingertip to the wrist, whose distance is maybe more than 20 cm. In the open surgery, you need the 20 cm depth of space to manipulate everything. But with a robot, just only a few minutes, a few centimeters (maybe just 2 cm) and the movement is much more freely than we do with hands. So less space is required for robotic accession. It is much less than handymen operation. The second reason is the scope system we use is 3-dimensional. From the 3-dimensional system you can very precisely access the vision, the space, the conditions and the distance. Hence, it can help you to get the precise dissection during the surgery. The third reason is that the scope can be totally controlled by the surgeon himself/herself. We know soft-scope operate requires a very vision and very capable
assistants. But sometimes the assistants do not know what
the surgeon is doing or what the surgeon wants. It is very
troublesome during the procedure. But using the robot, the
direction, the depth and the angle, can be controlled by the
surgeon, so it is the other advantage. These are the main
reasons why we choose robotic surgery.

JTD: Do you know the basic information about robotic
surgery practiced in Taiwan?

Prof. Lee: Until the end of the 2014. There were more
than 10,000 cases of robotic assisted surgery performed in
Taiwan, including 432 cases of thoracic surgery assisted by
robotic system. For the field of thoracic surgery, the robotic
assisted procedures included esophagectomy, thymectomy
and pulmonary lobectomy.

JTD: The cost of the robotic surgery is actually a bit high,
right?

Prof. Lee: Yes. One of the problems is the cost. Usually
in Taiwan, each patient who has receiving robotic assisted
surgery has additional pay for such instrumentation
arranging in 5,000 to 8,000 US dollars. But compared to
the other countries, I think the expense in robotic in Taiwan
is much less. Such as in Korea, as my understanding, the
cost imposed to the patient maybe higher than 10,000 US
dollars. So the cost is also a main concern actually.

JTD: Although robotic assisted surgery is still at the early
stage of development, what do you think of its future
development in next 20 years?

Prof. Lee: Although there are some advantages, actually
the robots are not perfect. There are some shortcomings.
The most obvious one is some space required for the robot’s
arms. The conflict between each arm is still a problem. The
robot arms cannot be too close to each other, otherwise
they will be in conflict. If the setting is such as contusive
occur the manipulation is quite difficult. So in the next
generation, we expect the robot move more freely and the
space not so large so we can put into small space. In the next
generation, robots may be just put in small incision, just a
combination of the single port in the robotic system. I think
it is promising. But as far as I know, the single port robotic
is remarkable already. But the instrumentation is still not so
as we expected on the advantages. But I think it is moving in
the right direction. We can expect that the next generation
would improve these instrumentations.

JTD: Besides the robotic surgery, you also had a lecture
on the complication of esophagectomy in this forum. To a
green surgeon, do you have any experience to share about
how to cope with complications?

Prof. Lee: I think accepting is the most important issue
on the procedure you adopt. Actually in the other sense,
open surgery is quite safe because you can see and handle
everything on sight and individualization. From the
surgical part, for the young surgeons who try to endeavor
the esophagectomy, I think it’s better to equip themselves
more familiar with the resident training in more institutes.
Once he had the confidence in doing the usual lobectomy
for lung cancer, even proceeding to the esophagectomy and
reconstruction. Finally, the most difficult and important
part is the anastomoses itself, which is much technical
demanded. In the first and last stage, anastomoses are
quite difficult in the beginning. So in Taiwan we also offer
some web labs for young surgeons to practice anastomoses
on a table with animal tissues. It is the two steps you
have to equip yourself with another simple procedure
such as lobectomy and the lymph node dissection. Once
you are going to another procedure such as laparoscope
gastric mobilization, and then are finally the anastomoses.
Therefore, if having chance, young surgeons have better
to go to a web lab and have some practice before really
practice anastomoses on patients.

JTD: As you are also interested in the pathogenesis and
molecular epidemiology, what advantages does the deep
knowledge of the two disciplines bring to your surgery and
research?

Prof. Lee: Yes, I did some studies about it. Actually my
PhD thesis is about the epidemiology of the esophageal
cancer in Taiwan. I am the first one in Taiwan to identify
that in addition to smoking and drinking, the bitter nut is
also a risk factor for Taiwan esophageal cancer.
As a matter of fact, I learned a lot from my PhD course
during molecular epidemiology study for esophageal cancer.
First, it helps me to identify who is the high-risk patient.
To the high-risk patients I have to cooperate with the
epidemiologists or the endoscopies to give a survey. Now
under this risk profile, we have started several investigation
programs to develop the diagnostic tool for the early-staged
patients, because I am also interested in treating esophageal
He. How far will the robotic-assisted surgery go?

cancer. The most effective way is to be treated in the very early stage, so we can handle with the endoscopic submucosal dissection (ESD) with photodynamic therapy or local treatment. If at the early stage, the patients can get rid of the diseases without any interference in their daily activities. It is the best way. So from the epidemiology study, it can help to identify a high-risk patient. Second, the study of statistical analysis helps me to conduct further clinical trial at the basic background study and clinical trial for more complicated diseases such as the surgery therapy and new therapy, and also the study in different surgical techniques. We have several studies ongoing in handle such terms.

\textit{JTD: Thank you very much!}

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