Prof. Seon-Hahn Kim: robotic surgery provides the opportunity to finish mission impossible

Prof. Kim is the Chairman of Department of Surgery, Korea University Hospital, Korea University College of Medicine, Seoul, Korea. He has been especially interested in minimally invasive colorectal surgery during the past 20 years. He obtained a research fellowship for colorectal laparoscopic surgery at the Department of Colorectal Surgery of the Cleveland Clinic Foundation, Cleveland, OH in 1995–1997 and received the outstanding surgical research fellow award.

Prof. Kim has performed more than 2,000 laparoscopic colon and rectal operations mainly for cancer. He then became used to "robot" after his the first case of robotic rectal cancer resection late 2007. Actually he embraced the technique so well that he developed single-docking fully robotic low anterior resection and performed around 500 cases using this technique (1). He has been doing many live robotic and laparoscopic surgeries demonstrated at various international congresses, and telecasted to oversea hospitals.

Besides a skilled surgeon, Prof. Kim is currently the Chairman of the Korean Society of Endoscopic and Laparoscopic Surgeons (KSELS, 2014-2016), and the President of Korean Association of Robotic Surgeons (KAROS, 2013-2015). He is also a visiting professor worldwide, including National University Hospital in Singapore, Royal Brisbane Hospital in Australia, Chinese University of Hong Kong, National Cheng Gong University in Taiwan, Kumamoto University in Japan, Karolinska University in Stockholm, Sweden, and University of Western Sydney, Australia.

In the ELSA 2015 conference in Daegu, we are honored to invite Prof. Kim for an interview, sharing his stories with robotic surgery (*Figure 1*).

JOVS: What are the updates in minimally invasive surgery (MIS) for colon and rectal cancer?

Prof. Kim: The role of MIS should be discussed separately between colon and rectal cancer, because the evidence we have had so far is different between colon and rectal cancer.

Figure 1 Prof. Seon Hahn Kim with *JOVS* editor.

I would like to start with colon cancer and its long-term oncologic safety was proven 10 years ago. But according to a recent Japanese Randomized Clinical Trial (RCT) for advanced colon cancer, the data of which was released in an international meeting, the data showed basically no difference in cancer survival between open and laparoscopic surgery. However, the overall data showed very excellent oncological outcome in both arms. Compared to previous outcomes obtained from other RCTs, the Japanese oncological outcome was exceptionally good. In my opinion, it means regardless open or laparoscope, it's important to have good surgical outcome. Therefore, the surgery quality is the key to have a good oncological outcome. This is the message obtained from that particular Japanese colon cancer RCT. That is the latest update in this field. In terms of rectal cancer, we still have several international multi-centers RCT and the mid-term oncologic outcomes released are equivalent between open and laparoscopic resection and we are still waiting for the long-term oncological outcome. I believe the outcome will be available within two years. After having that, we can say laparoscopic rectal resection is safe as open rectal resection. Single center observational data indicated equivalent oncological outcome compared to open resection.

Also, other focus should be difference between robotic cancer and laparoscopic cancer. That is a part of MIS

approach. So far, no report between robotic rectal cancer resection and laparoscopic rectal cancer resection in terms of long-term oncological safety has been found. We in Korea have been conducting a RCT which is still ongoing. The data will be available some years later. Another RCT also called "ROLAR" trial, mainly done in UK but a global trial reported the primary endpoint was the conversion rate (conversion to open procedure) between laparoscopic and robotic. It showed a little bit better in robotic arm and nevertheless did not reach high significance.

In my hospital, 93% MIS (laparoscopic and robotic) similar in colon and rectal cancer but in colon cancer all MIS is laparoscopic because the role of robot for colon cancer is very limited at this moment. All MIS is laparoscopic in my case for colon cancer, but for rectal cancer, in general 50% for each procedure. Since last year, the percentage of robot has been increased, up to 2/3 of all rectal cancer case.

Now our Korean government and our surgeons are talking about the insurance issue for robotic surgery but unfortunately the colon or rectal cancer is not very soon. Hopefully from this end of year, the prostate cancer will be covered by the national insurance. We don't know the exact date but the government is thinking about it and then the next target may be rectal cancer.

JOVS: When did you start robotic surgery and what is the motive?

Prof. Kim: I clearly remember the first date that I perform robotic surgery was on July 6, 2007. The reason why I started robot for rectal cancer was I have then thousands of laparoscopic rectal cancer resection experience, but I felt not every case was easy and sometimes very difficult even with that much experience. I can assume which case will be difficult or easy based on the patient information, images whatever. So at that time, I thought this particular subset of rectal cancer patient, may be performed by robot and more importantly, I noticed the data for robotic radical prostatectomy in the US in 2000 was 6 but when I searched the data again, it had been already more than 40% of total prostate cancer surgery was done by robot. It influenced me on my thoughts a lot because prostate and rectum is quite the same in difficulties in terms of exposure, because the small, narrow space, so I thought I may use robot for my difficult rectum. That may be the original intention I started the robot.

JOVS: How did you feel about your first robotic operation? What is the occasion where you made the procedure guideline book for robotic surgery?

Prof. Kim: The first robotic rectal surgery was something more than my expectation. That means that dissection was lovely. Everything is smooth. I was very happy. Just 6 months later, I collected 20 or so cases and presented the data at an international meeting, which is the robotic society meeting. After that, some people found me and said, "We are the engineers working in the company for this robot. Your technique and your way to do the robot surgery is exactly the same what we are looking for and what we are thinking for this particular type of surgery". Then they asked if there is any chance of collaboration together and I was happy. They came to my place and recorded all the video cases and outside we made a procedure guideline book as well at that time. That is the global starting point of using for other surgeons' practice.

JOVS: You have introduced a new stapler to divide the rectum by using the current robotic system, the so-called 'Smart-clamping robotic stapler'. Would you like to tell us the main advantage of this instrument?

Prof. Kim: My topic was a new stapler to divide the rectum by using the current robotic system, so-called the smart-clamping robotic stapler. The name has two very characteristic features, smart-clamping: the stapler has functional smart clamp including smart clamp feedback. The tissue is not perfectly educated to be divided at that moment, mainly because of thickness, the stapler processes to divide the rectum and when this is not further going on, the surgeon who is siting on the console to manipulate the staple has to do something. Otherwise, we cannot fire the stapler. For example, if the tissue is too thick once I clamp the stapler, the stapler provides me a signal in adequate clamp. In that case, I have to reopen and first wait 15 seconds to compress and squeeze the tissue to evacuate the water and the tissue become thinner, declamp and reclamp that process. Once the robotic stapler recognizes the tissue's thickness is getting better, it is further going. If not, it will still give the second messages. That is the basic concept. In the conference, I show my initial series, ten cases of pilot for learning and the real data is 11. That told me my previous concept, the surgeon's evaluation in the thickness of rectum may not always right. One example is radiated rectum which is thought to be thicker and deeper because of radiation.

However, my data showed sometime not radiated rectum.

The tissue thickness is not directly related to radiation or the tumor regression grade (how the tumor is reduced in that rectal radiation). Sometime we may have complicate remission cases after radiation. Sometimes the tumor remains big after radiation. We learn many things newly from that stapler which have smart clamp function so a lot of interest and feedback in my presentation of data. It is very much relevant and worthy to continue the study with that new machine. I think that may change our daily practice with the staple.

JOVS: Someone says it entails experience of laparoscopic surgery before robotic surgery. Do you agree?

Prof. Kim: That is a discussing issue in our society. For example, do we need a certain number of conventional laparoscopic cases prior to robotic surgery? The answer so far obtained from several different robotic surgeons is no. For some good robotic surgeons, they just directly move to robotic from open surgery. Their laparoscopic experience is small while mine is with many conventional laparoscopes than robotic so it is not mandatory. However, do we need certain number of open case? That question is also with no answer at this moment. Nowadays the young surgeons tend to start their daily practice with MIS. In Korea, the penetration rate of MIS is very high, almost all major hospitals even the secondary hospitals and the surgeons are doing a lot of laparoscopic surgery. The penetration rate according to national data is close to 70% of total colorectal resection done by laparoscope. So it's a kind of regular practice with less chance learning open surgery. However, when I asked the very similar question to my residents and young fellows, they also have two different opinions. That is a very interesting subject to be investigated in the near future. The majority is about operating time. Our recent papers have calculated many data, including interoperated event, operating time, complication and so on. Considering all factors, there is certain number learning curve but importantly, the learning curve for robot is more multi-faced and not for single case.

JOVS: What are your suggestions for the young surgeons?

Prof. Kim: They have to learn everything, open, laparoscope and robot as well. That is the other challenge because in many country the working time is getting strict within certain hours but they have to learn many more things in addition. It is getting more and more complicate and difficult for them to learn. That is the reason why recently the simulating teaching modules are getting in popularity.

JOVS: Thank you very much for your time!

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Footnote

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