

Professor Ali Zamir Khan: the robotic surgery experience

Submitted Feb 06, 2015. Accepted for publication Feb 06, 2015.

doi: 10.3978/j.issn.2305-5839.2015.02.20

View this article at: <http://dx.doi.org/10.3978/j.issn.2305-5839.2015.02.20>

Introduction

Prof. Ali Zamir Khan (*Figure 1*) is a leader in the field of minimally invasive and robotic thoracic surgery. He trained and worked in United Kingdom as a cardiothoracic surgeon for about 20 years before returning to India to start the Department of Minimally Invasive and Robotic Thoracic Surgery at Medanta—The Medicity. This is one of the premier multispecialty hospitals in India providing cutting edge tertiary care to patients. The minimally invasive surgery program is one of the most successful programs in India.

His special interest is in robotic and video-assisted surgical management in the field of lung surgery (including cancer, tuberculosis, bronchiectasis and aspergilloma), mediastinal surgery (Thymectomy for myasthenia & thymoma and resection of mediastinal cyst and tumors), cosmetic chest wall surgery, endobronchial surgery (lasering & stenting), diaphragm surgery (eventration, hernias and trauma), esophageal surgery (cancer, perforation, benign diseases), sympathetic nerve surgery (hyperhidrosis, intractable Ventricular fibrillation) and lung volume reduction surgery (emphysema).

Education is of high priority to Dr. Khan. To achieve this end, he has started a centre (SCALPEL) dedicated to training young surgeons from across the world in the field of minimally invasive and laparoscopic surgery. He also lectures at Rohilkhand Medical College and University to undergraduate and postgraduate medical students.

Having a strong interest in academics and research, Dr Khan has published more than 100 original research papers and chapters, and delivered more than 130 invited lectures all over the world. He is an integral member of the ethics committee of the hospital to approve research proposals.

He is a founder board member of Asian Thoracoscopic Education Program (ATEP) and the Indian Regent for European Society of Thoracic Surgeons.

He is also a keen innovator having patented multiple surgical instruments which have been named after him. He has also designed various teaching modules for training.

He has received numerous awards and honours for his contribution in clinical and academic excellence.



Figure 1 Prof. Ali Zamir Khan, MS, FRCS (Glasgow), FRCS (CTH), FEBTS (Europe), PGDM (Clinical Research, UK), CCT (UK), MBA; Head of Department of Minimally Invasive & Robotic Thoracic Surgery, Medanta, The Medicity, Sector 38, Gurgaon 122001, India; Visiting Professor of Rohilkhand Medical College & University, India; President of Society of Minimally Invasive Thoracic Surgery; Chairman of SALIZA Healthcare Private Limited; Director of Surgical Centre for Advanced LaParoscopy Education & Learning (SCALPEL).

Interview

ATM: *It seems that you prefer robotic surgery much more than VATS surgery. When did you start to conduct robotic surgery? And how many robotic surgeries have been done in your institution so far?*

Prof. Khan: I conducted my first robotic surgery in 2009. In my institution, we have done about 3,000 robotic surgeries together, including urology, thoracic surgery and gynecology.



Figure 2 Robotic aspergilloma lobectomy (1). Available online: <http://www.asvide.com/articles/465>

ATM: *How about the basic situation of robotic surgery in India? How many robotic cases a year in India?*

Prof. Khan: When I first came to my current institute about four years ago from UK, we had one or maybe two centres in India doing robotic surgery. Now we have about 40 centres across the country for robotic surgery and my center is doing the maximum number of robotic surgeries, especially in urology. If you take my center for example, we are doing two and a half to three thousand cases a year. So across the country, probably the number is 4,000 cases a year, which is a continually increasing number.

ATM: *How about the techniques of robotic surgery now?*

Prof. Khan: Indeed, it is becoming sophisticated. There are a lot of new techniques which we have developed at our centre (Figure 2). We are teaching people. So, I lecture almost every weekend across the country to teach robotic surgery. Therefore, more and more people are learning about robotic surgery and beginning to conduct it at their centres.

ATM: *How do you look at the high cost for a robotic surgery?*

Prof. Khan: In India, it is quite cheap as compared to Hong Kong or the US. For instance, a lobectomy in US would be about 10,000 dollars and about 20,000 Dollars in Hong Kong. In India the cost of a lobectomy is much cheaper at about 5,500 USD. Robotic surgery is becoming a regular surgery nowadays in India.

The actual problem is not the cost of the robotic surgery, but the cost of the robot. It consumes about 1 million to buy the machine, so it is expensive to start a robotic

surgery program. But in the long term, it is not expensive. There is a study done in my center which shows that VATS lobectomy is cheaper than open lobectomy. But more importantly, robotic lobectomy is also cheaper than open lobectomy. Most people think that open surgery is a cheap option, but actually it isn't. If we analyze in terms of less hospital stay, quicker recovery, less need for pain killers, earlier return to work, then VATS lobectomy is cheaper than open surgery. Similarly robotic lobectomy is also cheaper than the open approach, because in open surgery the patient stays in the hospital for 7-8 days but in robotics or VATS patient gets discharged on second day following surgery. Hence, the hospital stay reduces significantly. More patients can have surgery because bed spaces get available to the hospital. So if we look at the overall picture, robotic surgery turns out to be a cheaper alternative.

ATM: *As to the patients, do you know how they like robotic surgery?*

Prof. Khan: Patients love it, because my patients get admitted in the morning, and have surgery in the afternoon. The next morning on the ward round I take the drain out, and they are discharged by evening. So they are home within maximum 2-3 days. It makes a lot of difference to these patients if we can reduce the hospital stay. Less pain, less cuts and quicker recovery ensures that they can get back to work faster. In India, it is important for the patients to return to work early as they may not have many paid sick leave.

ATM: *How to cope with the complications when you are doing the robotic surgery?*

Prof. Khan: In robotic surgery, I am on the robotic console but another experienced surgeon is next to the patient. If there is a complication the assisting surgeon at patient's side can cope with it. Most of the time, you just need to convert from robotic to VATS. You do not need to open the chest, and by VATS you can tackle most of the complications. Occasionally, in life-threatening situations, you can convert to open surgery. It doesn't matter. The most important thing is that patient outcome should not be compromised.

ATM: *Regarding the training in robotic surgery, would you like to share some training experience in your country?*

Prof. Khan: I think it has multiple levels of training. I call it preceptorship model. You first come to an animal lab to learn

how the robot works, i.e., the basic steps of the robot. In the second step you learn the basic surgery by observation that is you come to my theater and watch me operate. The third step is that you go to your own theater and you operate under my supervision and finally do it independently. The same steps are repeated for learning any complex surgery. So it is a step-by-step training. It is called preceptorship. I am the mentor and they are the trainees. We have training courses in India where you get a certificate of competence to use the robot after you have done the training course.

ATM: What changes does robotic surgery bring to the multidisciplinary treatment?

Prof. Khan: Multidisciplinary treatment is a very common practice. We do have a tumor board discussion before operation, a multidisciplinary meeting where different specialist's meet and decide the treatment protocol. Another advantage of robotic surgery is that because healing is faster due to smaller cuts, the patient becomes fit for receiving adjuvant chemotherapy or radiotherapy within 2-3 weeks as opposed to open surgery when you need to wait at least 6 weeks before giving adjuvant chemo or radiotherapy.

ATM: What do think of the future development of the robotic surgery?

Prof. Khan: A new development in robotic surgery is the

ability to do this operation through a single port. The spider robot is a single device through which multiple hands come out after entering the body. These hands differentiate into a camera and multiple working instruments. Hence you do not need to make 3-4 holes as we currently do.

We also have the availability of giving patients fluorescent dye prior to surgery and by using laser techniques the dye lights up the blood supply of the organ, thereby making the surgery technically more accurate.

They are also working on miniaturization of the robotic platform so that in future we may have natural orifice surgery i.e., entering through the natural opening of the body and performing surgery without any cuts. That is the future.

ATM: Thank you very much!

Acknowledgements

Disclosure: The author declares no conflict of interest.

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(Science Editor: Melanie C. He, ATM, editor@atmjournals.org)

Cite this article as: He MC. Professor Ali Zamir Khan: the robotic surgery experience. *Ann Transl Med* 2015;3(4):58. doi: 10.3978/j.issn.2305-5839.2015.02.20