

# **Robots**

*changing the face of modern surgery*



*Robotic surgery offers a more patient-friendly option that is being increasingly used in urological surgeries, especially for cancer cases. Dr. Gagan Gautam, Head of Urologic Cancer Surgery & Robotic Surgery at Medanta - The Medicity, gives us an in-depth, all round look at this new procedure.*

**Q:** First of all, as a person who trained specifically in robotic surgery – could you explain what it is exactly?

**Dr. Gagan:** Robotic surgery – does not mean that robots perform the surgery – somehow, when we hear the term that’s what many people assume. For this procedure, the surgeon sits at a console, from where he controls the movements of fine instruments attached to robotic arms. So the surgeon controls the robotic instruments – the only difference here is that the surgeon’s hand is not the one directly touching the human body. The robotic arm is steadier, more precise and can access the interior of the body in a much better way than the human hand can. So we are using technology to improve the quality of our surgery and the outcomes.

**Q:** So the surgeons who do this surgery have a different kind of training?

**Dr. Gagan:** Yes. Of course, our basic training will be in Surgery. I did MS (General Surgery) followed by an M.Ch in Urologic Surgery at AIIMS before I went to the University Of Chicago Medical Center for 2 years to train as a Minimally Invasive and Robotic Urologic Cancer Surgeon. A well- trained and skilled surgeon can learn robotic techniques relatively faster than conventional laparoscopic or ‘key hole’ surgery. But definitely, only someone who is specifically trained in this technology should be doing this type of surgery – you have to get comfortable with letting the robotic arm become your arm. There are so many things involved.

**Q:** What are the advantages that

robotic surgery has when compared to the more traditional open surgery?

**Dr. Gagan:** Many advantages. Robotic surgery has a much faster recovery rate. Almost 60-70% of hospital stay time is reduced. Even during the surgery itself – blood loss is much less. For example, in a case of prostate surgery done through the open surgery method, many patients will require a blood transfusion due to blood loss during surgery. In robotic prostate surgery 95% of the cases do not need a transfusion. In the past fifty consecutive cases that I have done not one patient has needed a transfusion. That itself lowers so many other risks of blood-borne

infections and so on.

**Q:** In the field of urology, what kinds of cases are commonly coming in for robotic surgery?

**Dr. Gagan:** The majority of cases that we do are for prostate cancer. As you know, this is becoming increasingly common in senior men. If the cancer has not metastasized – meaning if it has not spread to other parts of the body- then the disease is well-treated by a robotic removal. In the hands of a good robotic surgeon, I would say that you get much better results, with much lesser complications for the patient than we were seeing generally with the open surgery approach. We are



*Dr. Gagan Gautam, prepped for robotic surgery*





*Robotic surgery is done with the surgeon seated at a console from where he controls the movements of the robotic arms of the machine.*

also utilizing this technology for the surgical treatment of kidney and bladder cancer. It is now becoming increasingly possible to remove the tumor from the kidney while leaving the normal part of the organ behind. Called a ‘partial nephrectomy’, it is greatly facilitated by a robotic approach, and has significant long-term advantages for the patient including a longer and a better quality of life as compared to complete kidney removal. Aggressive urinary bladder cancer may require complete removal of the bladder and reconstruction of a new bladder from the intestine. To my knowledge, we are the only robotic surgery team in the country performing both the parts of this procedure in a completely robotic fashion without needing to make an open incision.

**Q: What about the time that the surgery takes? Is it less or more with a robotic procedure?**

**Dr. Gagan:** It would approximately take the same time. The time factor depends on the surgeon – a very good open surgeon knows exactly what he should be doing because of his extensive experience. But an open surgeon who has come into robotic

surgery may want to be a little slower, and take a little more time for the sake of precision. Whereas an experienced robotic surgeon may take a little lesser time, and so on. In robotic surgery there is also the additional element of ‘docking’ the robot by the patient’s side. Getting things in place and getting ready to start the procedure from the console, takes a few more minutes. So basically both the procedures would take about the same time in experienced hands.

**Q: Is there a difference in anesthesia?**

**Dr. Gagan:** The surgery is just like any other – just that robotic arms are used, so anesthesia would be the same. But generally anesthetists are happier when they are attending a robotic surgery – because there is far less blood loss, the patient will be more stable. So they are not likely to have many unpleasant surprises.

**Q: What about the difference in time for hospital discharge, recovery and returning to normal daily activities?**

**Dr. Gagan:** It’s interesting – there’s a technical aspect as well as an

emotional aspect to that question – at least that’s what I have noticed in India. When I was in Chicago, the patient would be discharged the next day. Of course a part of that is driven by insurance and hospital stay costs etc. But they are definitely fit to leave the hospital the day after the surgery. But in India, I’ve noticed that patients are not ready to go home so soon. They feel better – physically and psychologically - if they spent a day or two more in the hospital itself. But usually patients are discharged within forty eight hours after surgery – much lesser time than if open surgery was done. And in most cases patients are completely recovered and back to their daily lives in two or three weeks.

**Q: What about post surgery trauma and pain?**

**Dr. Gagan:** That is another huge advantage for the patient. The pain is minimal compared to traditional surgery – so much that they don’t need painkiller injections after 24 hours. Usually what happens after the robotic procedure is – the patient gets injection the first day, which is stopped at night. The next day onwards they only need simple painkillers like paracetamol tablets.

**Q: Are there any differences in the scarring when compared to open surgery?**

**Dr. Gagan:** Well, scarring is always related to the cut that is made on the body. The longer the cut, the more scarring there will be. As far as robotic surgery is concerned, the cut itself is usually smaller. The cuts are small incisions – made for the arms of the robot and for the camera to go into the incision. So the camera is 1.2 cm; the arms are 0.8 cm, if an assistant port is used, that is about 0.5 to 1.2 cm – so you can see that the incisions are tiny, when compared

with the bigger cuts that are needed for a surgeon to do an open surgery. So by virtue of that, there will definitely be lesser scarring when robotic surgery is done.

**Q: Can you give us a proper idea of the surgery itself – what goes on, how is it done etc.? What is it about this procedure that makes it better as a procedure for the surgeon?**

**Dr. Gagan:** It's a huge difference – literally. When I am doing a robotic procedure, the visual that I get in my console is what the camera is seeing. So what I see is in 3D vision, with the depth perception field greatly magnified. So the actual visual that I get is almost ten to fifteen times magnified than what I would see with my naked eye. That itself makes for much better precision. While the camera gives me a superior view of the area that I am working on, the work that my hand is doing is being executed by the robotic arm. Now this arm is a mini-hand, capable of an amazing degree of wrist movement. So sitting in my console I can manipulate it with such micro precision, in multiple angles – which enables me to make precise small movements as and when the situation calls for it. In technical terms, this range of movement that the robotic wrist and arm provides, is called the '7 degrees of freedom' so you can imagine the range of movement that the surgeon gets from it. This is what is truly exciting about robotic surgery – it gives you so much more precise access and execution possibility.

**Q: With all these advantages, the procedure itself should be more expensive than open surgery?**

**Dr. Gagan:** The actual difference in cost varies from hospital to hospital. But I would say on an average, a robotic procedure would cost a patient about Rs.50,000 –

75,000 more than an open surgery would. It is an expensive piece of machinery, so the costs would understandably be more. But it means lesser complications, lesser scarring, lesser blood loss, lesser hospital stay and a faster recovery time. So these advantages offer better quality of experience and also cut down other incidental costs. I find that many patients coming in today are choosing robotic surgery since the benefits outweigh the increase in cost.

**Q: What is the usual response of patients after they have had a robotic procedure?**

**Dr. Gagan:** Generally the response I hear the most is that 'I recovered faster and I had less pain than I expected'. But I think it is all connected to the expectation you have when you come in for the surgery. There are people who have heard that robotic surgery is a wonderful alternative and they have extremely high hopes of their experience. You have to remember that robotic surgery does not convert a major surgery into a minor surgery. It still is a major surgery – it's only being performed in a different manner. But in my experience, I would say that 99% of patients are extremely happy with their experience and their recovery.

**Q: Robotic surgery is growing at a really rapid pace in India – which specialties are mainly using the procedure and how many hospitals would you say offer it now?**

**Dr. Gagan:** Actually almost 70% of robotic procedures are performed in urology itself, and about 30% are in cardiology, thoracic surgery, gynecology etc. And as you said, the number of hospitals offering it is growing every month in India. I would say that there are about twelve

to fifteen in India now that already do this surgery. When I went to train for robotic surgery, this was exactly why I chose this field. Because it was just beginning, so it's always exciting and challenging to be working with something that's new and upcoming. Robotic surgery is a mini-revolution in the history of modern surgery.

**Q: Since this is an emerging field, what do you think patients interested in robotic surgery should do to ensure that their surgery goes well?**

**Dr. Gagan:** You have to choose your surgeon with care. The more experience the surgeon has had, the better. Ask how many robotic surgeries the surgeon has done – if the number is five hundred or more, you can be sure you are in good hands. Similarly, if your surgeon is a person doing open surgery, and he has more than five hundred to his credit, you would be in good hands with him for an open surgery as well. The more experienced the surgeon is, the better the experience is likely to be.

**Dr. Gagan Gautam is Head of Urological Cancer Surgery (urologic oncology) and Robotic Surgery at the Division of Urology & Medanta Vattikuti Institute of Robotic Surgery at Medanta – The Medicity. He works on surgical care of patients suffering from urological cancers and has an extensive experience of over 500 robotic surgeries for prostate, bladder and kidney cancer. He is also an expert in robotic reconstructive surgery such as robotic pyeloplasty for ureteropelvic junction obstruction and other minimally invasive laparoscopic and endoscopic procedures for bladder and kidney cancer. Readers can get more information on Dr.Gagan and the work that he does at <http://www.facebook.com/roboticsurgerydelhi>.**