



Dr Mohan Keshavamurthy, Director of Urology, Uro-Oncology, Andrology, Transplant and Robotic Surgery at Fortis Hospitals, Bangalore



Dr. Anant Kumar, Chairman, Urology, Robotic, Uro-Oncology & Kidney transplantation, Max Hospital

surgeon is enough,” Dr Somashekhar explains. According to Dr Nagpal, “trained RAS surgeons need to take the lead”. She further clarifies, “if I am ready to teach and train, I need cadaver lab, a simulation lab and a proper institute. I have taken the initiative and written to the health ministry for setting up such centres. And this can happen only either at the government or corporate level.”

Dr Keshavamurthy has a different opinion. “As of now, we are following *guru-shishya parampara*. First I got trained, then I train the next surgeon and we train a few more. But this is a very slow process. The right process for a country of our size is a government-approved virtual program. 50 hours or virtual program followed by test and then a two-week cadaver program which is sponsored by Da Vinci at this point. This can be followed by observing live surgeries. This is a much faster process.”

AI & RAS

Artificial Intelligence (AI) is an indispensable factor when it comes to the evolution of robotic surgery. AI-based algorithms combined with the precision and control of surgical robots are revolutionising the way we look at surgeries in this age. It has the power to simplify the medium of interaction between surgical robots and surgeons, with

the help of deep machine learning data. “The RAS model that we have right now is called a slave. So the surgeon is the master. The robot replicates the instructions provided by the surgeon. The robot has no independent capacity for action or thought. There is a perception that when the machine takes over the procedure, the job of the surgeon will become redundant. I do not think that point will come. But certain parts of a procedure can be done safely by a robot, with the surgeon being in the operating theatre. These are semi-autonomous robots and they are already being manufactured, but not available for commercial use,” explains Dr. Pai.

“AI definitely can correct the surgeon if a certain set of parameters are fed into it. And there are certain things that AI can do like let’s say real-time mapping of the tension of the ligaments of the bone defect, which is in the knee due to osteoarthritis or in the hip due to trauma or osteoarthritis, which can be mapped even up to 1/10 of a millimetre or the deformity which can be mapped up to 0.1 degrees is so accurate that once you see the correction, it is predictable. So it’s very gratifying to see that you plan surgery with sub-millimetric precision and you’re able to execute it also with the same kind of precision,” says Dr. Aggarwal

Cost Factor:

Given that there are only about 4000-5000 robotic surgery centres in the world, the treatment is currently available only in limited centres in India. The cost of infrastructure, import of equipment, technical know-how and maintenance of equipment contribute to the treatment costs. “India is a country where cost sensitivity is very high. We have lot of patients who need robotic surgery, but they cannot afford it. Da Vinci System costs more than \$2million, and when a hospital invests in RAS, the patient has to bear the cost of the instrument, its maintenance and upkeep. There is no better way to bring down the