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Exploring New Horizons in Obstetrics & Gynecology

What to do Next after MD in Obstetrics and Gynecology?



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CHAPTER

4 Robotic Surgery: Next Frontier in Minimal Invasive Surgery

Rajendra P Shitole

OVERVIEW

Minimally invasive surgical procedures avoid open invasive surgery in favor of closed or local surgery with less trauma. These procedures can often be done vaginally or involve use of laparoscopic instruments. Laparoscopy allows observation of the surgical field through an endoscope or similar device, and is carried out through small incisions in the skin to allow access into the pelvis or abdomen. This may result in shorter hospital stays, or allow outpatient treatment.

The da Vinci® system is a robotic operating system (Fig. 4.1), approved by the US Food and Drug Administration (FDA) for gynecologic surgery in 2005, is one of the newest technologies available for the treatment of gynecologic problems including hysterectomy and ovarian surgery for cancer and other conditions such as pelvic organ prolapse.

For most patients, robotic surgery can offer numerous potential benefits over traditional approaches to vaginal, laparoscopic or open abdominal hysterectomy, particularly when performing more challenging procedures

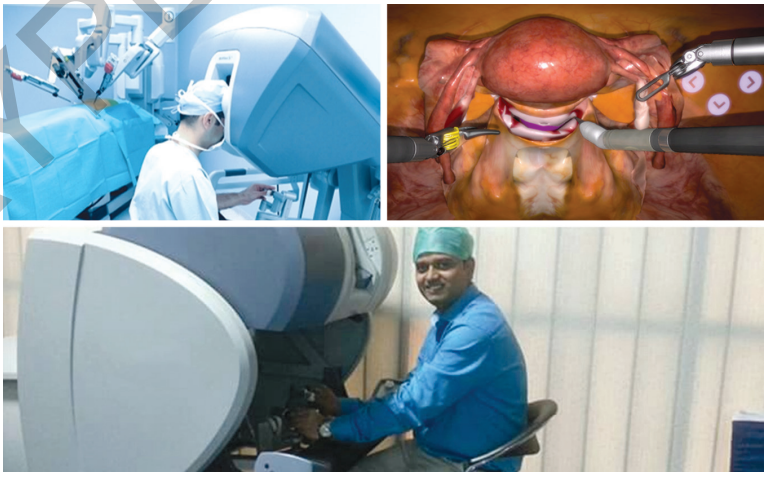

Fig. 4.1: Robotic operating system

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like radical hysterectomy for gynecologic cancer or sacrocolpopexy for pelvic organ prolapse. Potential benefits include:

- Significantly less pain
- Less blood loss
- Fewer complications
- Less scarring
- A shorter hospital stay
- A faster return to normal daily activities

It enables gynecologists to offer an effective minimally invasive approach for benign gynecologic conditions requiring surgery. Compared to conventional laparoscopic surgery, robotic assistance minimizes conversions as well as the need for total abdominal hysterectomy. The excellent visualization (3D HD vision), dexterity (EndoWrist instrumentation) and control (intuitive motion) provide surgeons with a surgical option to approach pathology minimally invasively, safely, reproducibly and even in high risk patients with adhesive disease, obesity.

In gynecology robotic surgery has many applications:

1. Benign hysterectomies (fibroids, AUB)
2. Surgeries for prolapse, SUI (sacrocolpopexy, hysteropexy, burch colposuspension)
3. Endometriosis
4. Gynecological oncology

Success in adoption of a surgical modality is highly dependent of the learning curve associated with acquisition of the necessary skills to comfortably and efficiently perform it. For the surgeon, robotic surgery overcomes some problems of conventional laparoscopic surgery. Muscular efforts are minimized because improved ergonomics when sitting at a console separate from the patient. Furthermore, combination of improved imaging and instrument control could allow for a faster surgical learning curve compared with conventional laparoscopy, which includes two-dimensional imaging and counterintuitive hand movements. However, even if the use of robot-assisted technology is believed to shorten the learning curve of complex minimally invasive procedures, the number of cases required for proficiency in robotic-assisted gynecological surgery is not clear.

Surgeons should be skilled at abdominal and laparoscopic approaches for a specific procedure before undertaking robotic approaches.

OPTIONS AVAILABLE FOR TRAINING IN ROBOTIC GYNECOLOGY

Institutional

- Institutions where robotic systems have been purchased and if you are working there, institute can send you or you can go for training through intuitive surgical at designated centers.

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- If you are working in other institute where robotic system is not available, but you are interested in learning robotic then you can apply to that institution for getting access to console and if institute is ready for same then you can apply for training through that institute with the help of da Vinci® representative.

It is a phasic training which includes online modules, training at institute level, hands on training on porcine (animal) lab at designated centers, hands on training at parent institute under mentor guidance, advanced hands on training cadavers in sequential manner. Cost of training is approximately *3,000 USD*. After completing training you will be designated as a console surgeon. You can check out details at *davincisurgerycommunity.com.*

Da Vinci® Training Passport Technology Training Pathway: Surgeon

Phase I: Introduction to da Vinci Technology:

- Test drive the da Vinci Surgical System
- Review procedure video relevant to your planned da Vinci procedures
- Complete live epicenter and/or standard case observation
- Complete live standard case observation

Phase II: da Vinci Technology Training:

- Complete da Vinci Technology online training (recommended)
- Complete da Vinci Technology In-Service with da Vinci representative
- Complete da Vinci Technology online assessment
- Perform da Vinci Technology Skills Drills
  - Skills Drills
  - Skills Simulator™ (if available)
- Review two full-length procedure videos relevant to your planned da Vinci procedures on da Vinci Online Community
- Complete preparation for da Vinci Technology Training (All above prerequisites must be complete prior to attendance).

In our experience with *da Vinci* Technology Training, increased retention, improvement of system skills and confidence are connected to the immediate application of the skills learned in *da Vinci* Technology Training. As a result, we highly recommend that the surgeon schedule at least two cases at his/her hospital to immediately following the *da Vinci* Technology Training.

Schedule and attend da Vinci Technology Training:

Important: da Vinci Technology Training is either 1 or 2 days, dependent on clinical specialty. Training times are dependent on the training center's hours of operation. Please contact your *da Vinci* representative for start and end times.

- If an attendee is more than 30 minutes late, the training may be cancelled and no certificate awarded.
- Leaving the training event prior to the completion of all tasks, will result in no certificate being awarded.

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- The surgeon is responsible for all costs associated with rescheduling when the reschedule is due to tardiness or early departure.
- If the surgeon is unable to complete the protocol within the scheduled time, no certificate will be awarded; however, rescheduling to complete another full *da Vinci* Technology Training will be permitted at no cost to the surgeon.

In this phase, exercises which will allow the surgeon to obtain basic skills and become familiar with the 3D environment will be performed by trainee on simulator modules as well as porcine model. These are as follow:

1. Port placement, Instrument control
2. Camera control
3. Fourth arm control
4. Coordinate tool control
5. Ball placement
6. Spatial control
7. Needle handling
8. Basic electrocautery
9. Tissue cutting
10. Tissue retraction
11. Blunt tissue dissection
12. Vessel dissection
13. Knot tying.

Phase III: Initial Case Series Plan:

Complete initial case series: In our experience, a proctor provides important guided training in the early *da Vinci* cases. One role of a proctor is to guide the surgeon and his/her *da Vinci* Surgery team through their initial *da Vinci* cases to assist with their mastery of the technology. The proctor may also be required to provide an assessment of the surgeon's surgical skills with the *da Vinci* Surgical System to your hospital. Your hospital's requirements for proctoring will govern, as *intuitive* does not provide any credentials or privileges. In addition, the surgeon should consider additional proctoring if she/he determines that it would be beneficial to his/her practice. The surgeon should be proctored until she/he determines, in his/her surgical judgment that he/she is sufficiently competent to operate independently.

Complete two da Vinci Technology skills development activities per week:

- Assist in a *da Vinci* procedure
- Perform a *da Vinci* procedure
- Complete a *da Vinci* Technology Skills Drills session
- Complete a *da Vinci Skills Simulator* session (if available)
- Review a *da Vinci* Surgery procedure video relevant to your planned *da Vinci* procedures.

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Fig. 4.2: Sample of *da Vinci* training certificate.

Phase IV: Continuing Development

- Attend surgeon-led course(s) (course details available in the da Vinci Training Passport brochure and course catalog. If not available in your market, please check with your da Vinci representative for course details.)
- Complete at least two additional activities after initial case series:
  - Surgeon lecture program
  - Complex *da Vinci* procedure observation
  - Complex *da Vinci* procedure video review
  - *da Vinci* surgery webinar
  - Peer-to-Peer consultation via Surgical Congress.

Certificate awarded at the end of completion of phase II (Fig. 4.2). After getting this certificate you are eligible to access console and do the surgeries.

Fellowships

Fellowships in robotic gynecology, robotic gyne-oncology are announced regularly by institutions on their websites where regular robotic surgeries are done and guides are available to train fellows. These are usually of 6 months to 1 year duration. Candidates can apply online and they will be called if selected depending on their publications, resume, and references. Fee structure and stipend varies depending on institution. The Vattikuti foundation is one which regularly announces national as well as international fellowships on their website *vfrsi.vattikutifoundation.com.* For other opportunities, you can search on google.com.

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During training fellows will be trained thoroughly about technology of robots, port placement, docking, undocking, dissection methods, use of electrocautery in robotics, suturing techniques, complications and safety measures.

After completion of training fellows will be awarded fellowship certificate and can work at parent institutions or can grab opportunities available at other robotic centers.

Pay scales for robotic surgeons differ according to institutions and patient load as cost of consumables required for single surgery is also high. Surgeons usually get more paid for robotic surgeries as total cost of surgical procedure is also high.

After robotic training there is definite change in operative acumen due to 3D vision and EndoWrist movements. Over a period of time after performing substantial number of cases surgeon can go for more complicated cases, e.g. stage 3 and 4 endometriosis, radical hysterectomies, etc.

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Exploring New Horizons in Obstetrics & Gynecology

Enigma surrounds our "decision making" many times. Be it the course to choose after 10th—Arts, Science, Commerce, etc. After choosing it, we think we are on right track and all things will be set. But just in 2 years at 12th standard, we are again in dilemma while choosing the professional college—Engineering or Medical or Something else!! This does not stop here and as Doctors we have to choose the next after MBBS—Post Graduation. Nowadays question arises even after MD—What to do next??

- Superspecialty is must nowadays!
- There is no terminal branch. Even Obstetrics & Gynecology is not a Terminal Branch as was thought!
- What next after MD/MS—not just Superspecialty!
- Many options are available other than routine prototype Superspecialties!
- World is expanding in not just four directions!
- We as doctors often lag behind as Entrepreneurs, Financial experts, Legal experts or Administrators!
- We do not think these fields are for us!
- Can we EXPLORE NEW HORIZONS!!! Let's find out.

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