Embracing New Technologies and Techniques

Doctors do not like change. This is a statement that does not seem to make sense, as medicine changes continuously. Many doctors and many centers have been resistant to adopt new technologies. Even those doctors who have embraced robotics cannot become complacent and believe that they have reached the peak and do not need to change further. We should always continue to look for better, more efficient ways of performing surgery to help our patients. However, we do not always need to get more technical to advance.

In this edition of Robotic Surgery Advantage, we present a technique that we pioneered on morcellation of a large fibroid uterus. Once a uterus reaches 14 cm, surgery to remove it becomes lengthier. We have tried all the morcellators, vaginal morcellation, and vaginal coring, and have developed this new technique that morcellates the uterus into smaller pieces the size of a normal uterus with a simple, inexpensive, robotically attached knife. This procedure saves us endless hours in the operating room and allows us to do even 30 cm fibroids robotically at 0.001 percent the cost of other morcellators.

Another change we are undertaking is the use of single-site robotic surgery for cholecystectomy. This procedure is a relatively simple surgery laparoscopically, but single-site laparoscopy is not an easy procedure. Robotics adds a simpler platform to use. With advancement of the technique and learning the limitations of single-site robotic surgery, we believe that we will be able to adapt it to bigger and more complex procedures, as we did with multiport robotics. Our Center is a pioneer in single-site robotics and a teaching facility for this procedure.

Finally, one of our urologists describes a novel hybrid suturing technique used in nephrectomy.
While the debate about warm ischemic time (WIT) during partial nephrectomy continues, a hybrid suturing technique used by robotic surgeons at Baptist Health’s Center for Robotic Surgery has reduced average WIT to less than 25 minutes.

According to urologist Yekutiel Sandman, M.D., the technique allows surgeons to remove tumors as large as 4.2 cm, as well as reduce WIT. Hem-o-Lok clips have revolutionized how quickly they can do this surgery.

“Now we’ve taken it a step further,” explained Dr. Sandman, who is chief of urology at Baptist Hospital of Miami. “We’re using barbed sutures, which allow you to sew even more quickly, and the sliding Weck clip technique expedites how quickly we can repair the kidney after excising the mass.”

As a result of the technique, WIT has averaged between 18 and 25 minutes for tumors up to 3.5 cm, compared with an average of up to 40 minutes for laparoscopic nephrectomies as reported in early studies of robotic partial nephrectomies. In addition, robotic technology allows doctors to do minimally invasive, nephron-sparing surgery over a wider area of the kidney.

“When we were doing laparoscopic partial nephrectomies, we would do only very select small exophytic tumors,” Dr. Sandman said. “Now we are able to do more endophytic tumors, not just lower pole tumors, but also tumors in the posterior and medial areas of the kidney, so it has expanded the geography where we can do partials.”

In terms of patient outcomes with robotic surgery, the average hospital stay is three days and the complication rate is significantly lower than with laparoscopic surgery, according to Dr. Sandman. Thus far, the recurrence rate is zero.

“The baseline to compare this to is open nephrectomy,” he said. “That would compare to a 10-inch flank incision with five to seven days in the hospital and a three-month recovery, versus 5 to 12 mm incisions with three days in the hospital, two-week overall recovery, and a month until resuming normal function entirely.”

The other comparison to robotic-assisted partial nephrectomy is ablation therapy, he added.

“The overall relative risk of recurrence [for ablation] is 50 percent higher than excision, although it is still a small number,” Dr. Sandman said. “The other problem is that you’ve pretty much eliminated the possibility of open partial nephrectomy after ablation—there is too much scarring. So if the ablation fails, then you need to take out the kidney.”
ROBOTICS PUTS SCAR-FREE SINGLE-SITE SURGERY WITHIN REACH

Scarless surgery has been called the Holy Grail. Since single-incision laparoscopic cholecystectomy was introduced in 2008, however, the difficulty of getting three instruments and a camera through one incision in the umbilicus has kept this outcome just beyond the grasp of most surgeons.

Because of the difficulty, said Anthony Gonzalez, M.D., chief of surgery and minimally invasive and robotic surgery at Baptist Hospital and medical director of the weight-loss surgery program at South Miami Hospital, only simple cholecystectomies are performed using single-incision laparoscopy, while 95 percent of all gallbladder surgeries are done with three or four incisions.

Since 2009, he has performed more than 300 of the difficult single-incision procedures, but following FDA approval in 2011 of using robotics in single-incision cholecystectomy, he has done more than 200 robotically.

“The difference with the robotic platform versus laparoscopic technique is like operating in bright sunshine versus operating in the dark,” he said.

With single-incision laparoscopy, Dr. Gonzalez operates in a confined surgical field with a two-dimensional image and instruments that are relatively rigid and parallel. Triangulation, where one point is the organ and the other two points are the instruments, is difficult to achieve. There are a high number of collisions, when the surgeon’s hands and the instruments get in each other’s way.

“With robotics, we have three-dimensional visualization, triangulation is simpler and safer, and collisions are eliminated,” he said.

Compared with single-incision laparoscopic surgery, patients undergoing robotic single-incision surgery experience about the same amount of pain, and recovery is equally fast. Most patients go home the same day, return to work in two days, and can exercise in two weeks. The big advantage of the single-incision surgery is no scar.

Dr. Gonzalez said that due to the much greater range of motion possible with robotics, the learning curve is not as steep as with traditional laparoscopic surgery. Consequently, more surgeons are likely to become certified for general robotic surgery and earn additional certification for single-incision procedures. He is training a few surgeons per week. Soon, more will be able to perform robotic single-incision scarless cholecystectomies for patients with more complex gallbladder issues.

Jorge Rabaza, M.D., chief of surgery at South Miami Hospital, agreed. Having done a few of the difficult nonrobotic single-incision laparoscopic cholecystectomies, he said the old procedure required surgeons to change their technique drastically. As a result, he returned to multi-incision laparoscopic surgeries until last January, when he became certified for single-incision robotic surgery. He has since done more than 100.

“For the surgeon, when you are doing a robotic single-site cholecystectomy, it is hard to tell the difference from when you are doing a multilumen laparoscopic cholecystectomy. You are not changing your technique at all,” Dr. Rabaza said.

Once incisions and port placements are completed, the robot is brought over the patient’s right shoulder for a robotic-assisted, single-incision cholecystectomy. Inset: The cystic duct and cystic artery are exposed during dissection of the triangle of Calot.
More Gynecologic Patients Can Benefit From Robotic Techniques

A new technique using a very small robotic-controlled knife for morcellating large uteri is extending the benefits of robotic laparoscopic surgery to more patients referred to South Miami Hospital’s Center for Robotic Surgery.

Despite the benefits of minimally invasive gynecologic surgeries, a 2009 analysis of more than 94,000 hysterectomies performed from 2000 to 2005 revealed that 78 percent of advanced gynecologic surgeries are still performed through abdominal incision.

Reasons cited include the steep learning curve for laparoscopic surgery and the limitations of the approach for advanced gynecologic surgeries, including the difficulty of removing large fibroids and large uteri.

However, many of these limitations have been overcome since FDA approval in 2005 of a robotic system, said Ricardo Estape, M.D., medical director of the Center for Robotic Surgery. Dr. Estape has performed more than 2,500 robot-assisted gynecologic surgeries since 2006 at the Center. To meet increasing volume, the Center recently added its fifth robotic system. Baptist Health South Florida, which includes Baptist, Doctors, and South Miami hospitals, has a total of nine robotic systems.

"While most surgeons are comfortable with removing 10- to 12-cm uteri using robotic-assisted techniques, we are comfortable with uteri as large as 20 cm to 30 cm," he said. "Blood loss is next to zero and postsurgery transfusion rate is next to zero."

As a result of the volume of robotic gynecologic surgeries at South Miami Hospital’s Center for Robotic Surgery, the surgeons can extend the benefits to more patients with broader ranges of gynecological diseases.

"Our experience shows that for most robot-assisted cervical and endometrial cancer surgeries performed at South Miami Hospital, patients go home in 0.9 days," Dr. Estape said. "Our complication rate with robotic surgery is about 0.1 percent, compared with 1 percent for open surgery, a tenfold reduction in complications."

"In today’s world there is really no place for open surgery for most patients," Dr. Estape added. "In terms of comfort, recovery, and lower complication rates, robot-assisted laparoscopic surgery is much better for patients."