Efficient Retraction

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A look at how retractors and retractor systems have improved to allow surgeons to operate more efficiently and safely.

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Self-retaining retractors free up surgical staff members to concentrate on other important tasks during a procedure.

Retractors have been around since surgery began, meeting the need to retract organs or tissue for visualization and access during a procedure. In fact, it is often joked in the medical community that it is the job of a medical student to serve as the retractor during a surgical case. For hours, the student may stand there, holding a retractor while the surgeon operates.

Thankfully for medical students, surgeons and patients alike, the technology of surgical retractors and retractor systems has evolved to make the process of retraction easier for the surgical staff. Today, retractors serve as instrumentation that allows surgeons to operate more efficiently and more safely than ever before.

The Evolution of the Retractor

According to Peter Rosenblatt, MD, Director of Urogynecology at Mt. Auburn Hospital in Cambridge, MA, before the retractors available to surgeons today were around, retraction was truly about manpower.

“Vaginal surgery is very challenging because you’re working in a deep, narrow space and, especially in reconstructive pelvic surgery where you are restoring pelvic support using ligaments near the sacrum, your vision and your access is really limited,” he says. “So, it was a matter of getting enough people in the OR – medical students, residents or fellows – to hold individual clamps in such a way that you could see. It was not unusual to have as many as 10 clamps at a time, everyone trying to hold them up in different directions to facilitate visualization.”

Dr. Drelichman says small wound retractors such as the Alexis Wound Retractor retract the incision while keeping the wound site clean, which is critical in cases such as laparoscopic colorectal surgery.

This, Dr. Rosenblatt says, was very cumbersome. Often, the field of vision became filled with hands and instruments. As an intermediary step in the late 1990s, he recalls attaching a clamp to a drape with a rubber band, creating a homemade self-retaining retractor. This too, he says, was cumbersome, not to mention time consuming.

While it depends on the specific procedure being performed, these days Dr. Rosenblatt is using a lightweight self-retaining retractor – meaning it can retract by being attached to the patient, without someone holding it. More specifically, he often uses the Lone Star Retractor (CooperSurgical) for most of his cases that require retraction, such as vaginal reconstructive surgery. It contains a double ring with a joint and elastic stays with tiny hooks that grasp to tissue. Because the stays are elastic, the retractor has some “give” to it to endure the pushing and pulling associated with vaginal surgery without tearing the tissue, but with enough recoil to maintain retraction.

The self-retaining retractor design, Dr. Rosenblatt says, is “one of the simplest and greatest inventions in gynecologic surgery.”

“One of the difficulties with vaginal surgery is the wear-and-tear that it has on your assistants,” he explains. “When we used to have people hold clamps in every which way, people would really have muscle strain, and the vision was not consistent. The retractor never complains you’re over-working it. It lasts throughout the case and frees up your assistants’ hands, so they can concentrate on other important tasks during surgery, like suctioning, dabbing with a sponge or placing clamps. It’s completely self-contained and automated, and you can always make adjustments as necessary.”

For Ernesto Drelichman, MD, a colorectal and general surgeon at St. John Providence Health System in Michigan, self-retaining retractors are useful for

providing consistent and steady exposure.

“A key part of any operation is to have good exposure in order to visualize the operating field, the surrounding structures, and to perform the intended procedure safely,” Dr. Drelichman says. He also notes that in the pelvis, which is deep and dark, lighted retractors, such as the lighted St. Marks retractor, provide improved visualization.

Not only does the self-retaining design of the retractors available today allow surgeons better access, but the rise of minimally-invasive surgery has resulted in modified instrumentation for smaller retraction.

Dr. Drelichman explains retractors for laparoscopic colorectal surgery have proven valuable in his practice for several reasons. He says small wound retractors available today, such as the Alexis Wound Retractor (Applied Medical), are helpful because they keep the wound clean in cases at risk for contamination, such as laparoscopic colorectal surgery.

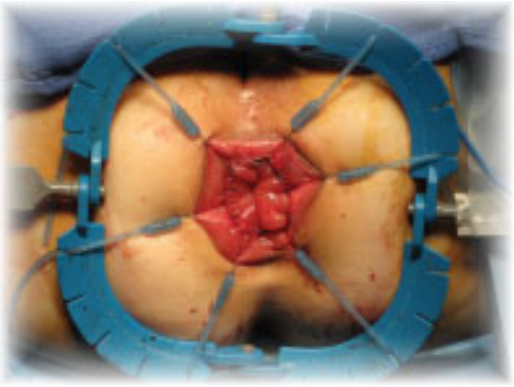
“We like to mobilize the colon laparoscopically and externalize it, resect it and do our anastomosis externally,” Dr. Drelichman says. “When you do your resection, you worry about contamination. The part that is most susceptible to get infected is the superficial part, the subcutaneous fat. So, this retractor is helpful because it retracts the incision open so you can work, and it also protects the subcutaneous space with a plastic lining. This is helpful because when you’re doing any bowel work, especially if you’re doing cancers, you don’t want that to touch the subcutaneous space and have a wound site recurrence of cancer or a wound infection.”

To further accommodate laparoscopic surgery, some retractors offer the ability to attach a port, such as a GelPort (Applied Medical), directly to the retractor, Dr. Drelichman says. This allows the surgeon to perform a hand-assisted technique.

Overall, the effect of minimally invasive surgical technique has meant making retractors smaller and less cumbersome – so it is easier for surgeons to work in a small space.

“If you think about the types of retractors we used in the past, they were large, awkward and inefficient,” Dr. Rosenblatt says. “As we get less and less invasive in surgery, the needs change. We still need retraction, but we don’t need all that hardware. You don’t want big, heavy, cumbersome instruments. You don’t need them.”

While the rise of minimally invasive surgery has resulted in the development of smaller retractors, Dr. Drelichman notes that for larger open cases, he often still relies on the Bookwalter retractor, a device that has been available for a long time. Sometimes, he uses the Bookwalter in conjunction with a flexible retractor to achieve adequate exposure for these procedures.



"For gynecologic and colorectal surgeons, gaining exposure in the perineum is a real challenge," Dr. Drelichman says. The Lone Star Retractor is disposable, self-retaining and adjustable, providing exposure in the perineum for vaginal and colorectal procedures.

Key Attributes

For Dr. Rosenblatt, assessing new retractors means looking at the following key features to the instrumentation:

1. Low profile: the retractor must be small enough that it will not get in the surgeon’s way as he/she works.
2. It must retract tissue effectively.
3. It must have some “give” to it, as not to tear tissue to which it is attached.
4. A design for deep sites.
5. Low cost.
6. Reusability, if possible, while still being lightweight.

Dr. Rosenblatt says that in the future he’ll look for a retractor that possibly has a grasping function to attach to tissue, rather than the sharp tips on the retractors he uses now.

“One of the slight disadvantages is the sharp little tips that grab tissue and can sometimes grab and tear your glove,” he says. “Several years ago, tips were introduced that were more like an Allis clamp that grabbed tissue instead of having a sharp barb, but they were too large. I think if we were able to get a grasping instrument that was low-profile that would be very useful.”

As for Dr. Drelichman, he says key attributes to look for in a retractor include:

1. The ability to effectively expose what it is supposed to.
2. Ease of use.
3. A self-retaining design, if possible.

In the future, Dr. Drelichman says he would like to see an effective retractor system that holds the abdomen up without requiring a pneumoperitoneum. There are currently cameras to attach to the retractors, but these can also be improved.

Overall, retractors and retraction systems have come a long way since the days of requiring several surgical staff members to hold retractors for hours. While this may still occur in some ORs, technology has advanced in a way that allows surgeons to achieve retraction more efficiently than ever before.

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