Robotic-Assisted, Umbilical Hernia Repair

What is Robotic-Assisted Laparoscopic Surgery?

Robotic-assisted laparoscopic surgery is a minimally invasive technique that uses advanced robotic technology to help the surgeon perform precise movements through small incisions. During the procedure, the surgeon “docks” the robot to the patient and then sits at an adjacent console, which is close to the operating table. From the console, the surgeon uses hand and foot controls to guide the robotic arms and instruments inside the patient. The robotic system provides a high-definition, 3D view of the surgical area and allows for enhanced precision, flexibility, and control. The rest of the surgical team remains at the bedside to assist with the procedure and patient care.

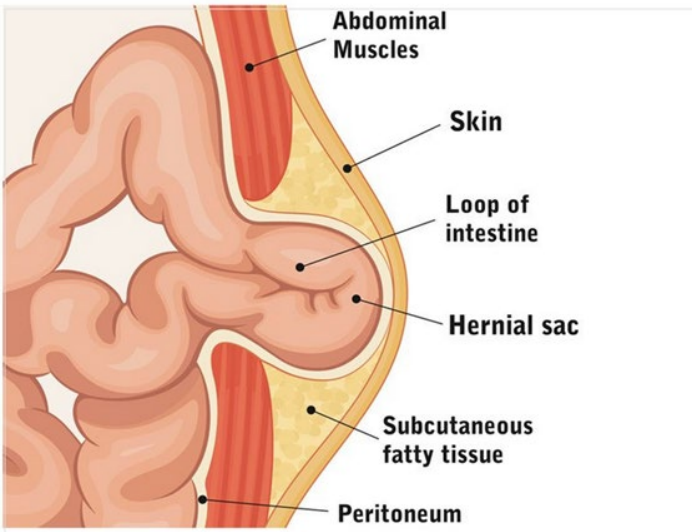
Basics of Abdominal Wall Anatomy

The abdominal wall is made up of several layers that work together to contain and protect the abdominal organs:

- Skin on the outside
- Subcutaneous fatty tissue beneath the skin
- Abdominal muscles and fascia, which provide strength and support
- Peritoneum, a thin inner lining that separates the abdominal wall from the organs inside
- Abdominal contents, such as loops of intestine

What Is an Umbilical Hernia?

An umbilical hernia occurs when tissue from inside the abdomen pushes through a weak area in the abdominal wall at or near the belly button. The drawing shows small intestine caught in the hernia. However, the hernia may contain pre-peritoneal fat, omentum (intra-abdominal fat pad), or colon.



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Types of Umbilical Hernias:

- **Reducible**- the hernia disappears when pushed back in
- **Incarcerated**- the hernia remains despite efforts to push back in
- **Strangulated**- blood supply to the hernia contents is compromised meaning hernia contents are at risk of dying. This is a surgical emergency. If I feel this is the case, I will send you to the Emergency Department.
- **Recurrent**- the hernia was repaired once before but has come back.

How Do Umbilical Hernias Form?

The abdominal wall has natural weak points. An umbilical hernia occurs when there is a defect or weakness in the fascial layer at the level of the belly button, allowing the peritoneum to bulge outward and form a hernia sac, which may contain fat or intestine. This creates a visible or palpable bulge beneath the skin.

When Is Surgical Repair Recommended?

Surgery is commonly recommended when the hernia causes symptoms, enlarges, or interferes with daily activities.

How We Decide When Mesh Is Recommended?

Key factors in surgical planning is the size of the fascial defect, BMI, or if it is recurrent- not necessarily the size of the bulge seen at the level of the skin.

The defect size can be determined by:

- Physical examination
- Ultrasound
- CT scan, when additional detail is needed

If the fascial defect is 2 cm or less, a suture-only repair may be appropriate in selected patients. If the defect is greater than 2 cm, if this is a recurrent umbilical hernia**,** or if BMI is high, mesh implantation is generally advised to reinforce the abdominal wall and reduce the risk of recurrence.

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Surgical Options for Umbilical Hernia Repair

Open Repair

An open repair is often used for smaller hernias or when a minimally invasive approach is not ideal. When mesh is used in an open repair, it is typically for hernias > 2 cm (~ 1 inch) and it is placed in:

- The pre-peritoneal space, or
- The retromuscular (retrorectus) space, located behind the rectus muscles (six-pack) and in front of the posterior rectus sheath.

Robotic-Assisted Repair

A robotic-assisted approach is a minimally invasive option that allows precise reconstruction through small incisions.

The surgeon operates from a console using robotic arms and a 3D high-definition camera. Three small incisions are placed at least 20 cm (approximately 8 inches) off the midline to provide optimal spacing and good mechanical advantage.

A pre-peritoneal space is created, the hernia defect is closed, and mesh is placed to reinforce the repair when indicated. Because the robotic approach provides easy access to the entire abdominal wall, it allows greater mesh overlap around the hernia defect.

If the peritoneum is very thin, and a pre-peritoneal approach not be feasible, a specially coated mesh may be placed inside the abdomen to bolster the repair while minimizing the risk of internal organs adhering to the mesh.

Careful reconstruction is performed to restore a natural, inward-appearing umbilicus whenever possible.

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Patient Optimization Before Surgery

Optimizing overall health before surgery helps reduce complications and improve healing.

- **Smoking cessation**: Smoking significantly increases the risk of wound complications, infection, and hernia recurrence. Patients are strongly encouraged to stop smoking well before surgery and remain smoke-free during recovery.

- **Diabetes control**: Poor blood sugar control increases the risk of infection and delayed healing. When applicable, we aim for a hemoglobin A1C less than 7% prior to elective hernia repair.

Other individualized measures may include weight management and treatment of chronic medical conditions as part of preoperative planning.

Risks During Umbilical Hernia Repair

All surgical procedures carry risks. These risks apply to both open and robotic-assisted repairs, although their likelihood varies based on anatomy and hernia size.

- **Bleeding:** Usually minimal and controlled during surgery; rarely requires transfusion or additional procedures.

- **Infection:** May involve skin incisions or, less commonly, the mesh. Treatment may include antibiotics or further intervention.

- **Injury to underlying structures:** There is a small risk of injury to the intestine, blood vessels, or abdominal wall nerves. With robotic surgery, this includes a specific risk at the time of abdominal entry using the Optiview technique, where underlying structures could be injured despite direct visualization.

- **Recurrence:** Even with proper technique and mesh reinforcement, the hernia may recur over time.

Other potential risks include chronic pain, fluid collections (seroma), scarring, or the need for additional surgery.

Steps We Take to Minimize Risk

Several measures are routinely taken to reduce operative risk and improve outcomes:

- Careful preoperative evaluation and imaging when indicated to define anatomy and defect size.
- Direct visualization entry (Optiview) at a safe access point to reduce injury to underlying structures during abdominal entry for robotic approaches.
- Strategic port placement away from the hernia and prior scars.
- Use of 3D visualization and precise dissection with the robotic platform when applicable.
- Placement of mesh in well-protected tissue planes whenever possible.
- Meticulous hemostasis to minimize bleeding.
- Sterile instruments, antiseptic skin cleaning, and antibiotics administered before surgery are all utilized to reduce infection risk.
- Careful layered closure and umbilical reconstruction to restore anatomy and appearance

After Surgery: Wound Care

- Incisions are closed with absorbable sutures under the skin and with Dermabond- a purple protective covering. Dermabond is watertight.
- It is OK to shower day of surgery- just pat all wounds dry.
- A compressive umbilical dressing will likely be applied. Please remove **Sunday** after surgery.
- Please do not expose wounds to sunlight for 6 months after surgery. The wounds are young and the skin cells are immature. If they become sunburned, they may become permanently discolored.

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Pain Control After Surgery

Post-operative pain control is customized to each individual and is designed to maximize comfort while minimizing opioid use.

A nerve block may be provided by the anesthesia team to help reduce pain immediately after surgery.

Scheduled medications (first 3 days):

- **Acetaminophen (Tylenol)** 1,000 mg every 6 hours
- **Celecoxib (Celebrex)** 200 mg every 12 hours
- **Methocarbamol (Robaxin)** 500 mg every 8 hours

After the first 3 days, these medications may be taken **as needed** rather than on a fixed schedule.

A **narcotic pain medication** will be prescribed **for breakthrough pain** that is not controlled with the above regimen.

Post-Operative Activity Limitations

- Walking is encouraged starting the day of surgery
- Avoid lifting, pushing, or pulling **more than 10–15 pounds** for **4 weeks**
- Avoid strenuous activity and core exercises during this period
- Driving may resume once you are off narcotic pain medications
- We will discuss lifting restrictions during your first post-operative visit

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When to Call the Office

Please contact the office if you have any:

- Fever **greater than 101°F**
- Increasing redness, warmth, swelling, or drainage from the incision
- Worsening pain not improving with prescribed medications
- Persistent nausea or vomiting
- Increasing abdominal swelling or a new bulge at the surgical site
- Any concerns about your incision, recovery, or activity restrictions
- Constipation
- General questions or concerns

For severe symptoms such as uncontrolled pain, shortness of breath, chest pain, or inability to keep fluids down, seek urgent medical attention.

This handout is intended for patient education. Surgical technique, pain management, mesh selection, and recovery are individualized based on anatomy and clinical findings.

This QR Code takes you to a site that has this guide in electronic (pdf) format for ease of use / reference (drop down menu on far right). The site also contains additional information on scheduling surgery, what to expect on day of surgery, etc.