Abdominal incisions, principles, types and choice

Well-performed incision is of paramount importance to abdominal surgery. Of equal importance is a proper method of wound closure. Any error, such as a poorly chosen incision, unsatisfactory means to close, or unsuitable selection of suture material, may result in serious complications including hematoma, hernia, wound infection, stitch abscess, unpleasant scar, and the wound dehiscence and evisceration.

Three basic principles to guide selection of the incision and closure of the wound. These are **accessibility, flexibility, and security.**

- **Accessibility.** The incision should provide direct and timely exposure to the diseased or injured anatomy and must provide sufficient space for the procedure to be well performed. Exposure is greatly facilitated not only by a well-made incision, but also by the apt use of retractors and packs, correct posture of the patient on the operating room table, and optimized lighting.
- **Flexibility.** The incision should be amenable to extension if the complexity of the procedure demands greater exposure than originally anticipated. It should, however, interfere as little as possible with the function of the abdominal wall, limiting sacrifice of nerve supply to the abdominal musculature, preferably the sacrifice of only a single segmental nerve trunk.
- **Security.** Closure of the wound must be strong and reliable. Ideally, it should leave the abdominal wall with integrity comparable to or superior to its preoperative state.

Types of Incisions

Abdominal incisions can be divided into ***four*** main anatomic categories.

- **Vertical.** Vertical incisions may be midline or paramedian. They may be supraumbilical or infraumbilical and can be extended superiorly or inferiorly in either direction. For optimal exposure of the entire abdominal cavity, as in the case of abdominal trauma, a midline vertical incision can be taken superiorly to the xiphoid process and inferiorly to the symphysis pubis.
- **Transverse and oblique.** These incisions can be placed in any of the four quadrants of the abdomen. Common incisions include the Kocher subcostal incision for biliary surgery, the Pfannenstiel infraumbilical incision for gynecologic surgery, the McBurney incision for appendectomy, and the transverse or oblique lateral incision for exposure of the colon.
- **Abdominothoracic.** This incision provides superior exposure of the upper abdominal organs by joining the peritoneal cavity, pleural space, and mediastinum into a single operative field. It is particularly useful for extensive exposure of the liver and esophagogastric junction.

- **Retroperitoneal and extraperitoneal.** These incisions are ideal for surgery of the kidney, adrenal gland, aorta, and for renal transplantation.

Choice of Incision

Many factors influence the choice of incision for abdominal surgery. These include:

- The organ of interest,
- Anticipated procedure,
- The body habitus of the patient and degree of obesity,
- The urgency of the operation and whether speed is a pressing consideration,
- The presence of previous abdominal incisions, and the
- Preference and experience of the operating surgeon.

Most surgeons prefer a midline or paramedian approach to the abdominal viscera. In emergency operations, the midline incision undoubtedly provides the most rapid access to the abdominal cavity, and if necessary can be extended swiftly بسرعة شديدة to the whole length of the abdominal wall. Re-entry into the abdomen should be achieved through the previous incision, if possible. If the previous incision is weak or a site of incisional hernia, the abdominal wall can be repaired at this time. A new incision should never be made closely parallel (within 5 cm) to the site of any previous incision without understanding the distinct risk of ischemic necrosis of intervening skin and fascial bridges. Future surgical prospects are considered and the incision should be placed so that it will not interfere with planned procedures, for example, to avoid or incorporate colostomies, fistulas, and the like. Similarly if the patient has the potential for recurrent disease requiring re-exploration, consideration of location is important.

Midline versus Transverse Incisions

- In thin patients with narrow subcostal angles, a transverse or oblique incision has little advantage; however, in obese patients with wide subcostal angles, a subcostal incision provides excellent exposure of the upper abdominal viscera, biliary tract, spleen, and pancreas.
- There are many occasions, however, in which either a vertical or a transverse incision would provide appropriate an equal exposure.
- Some authors feel that transverse incisions in abdominal surgery are based on better anatomic and surgical principles than vertical incisions and should be preferred. Anatomically, the fascial fibers of the anterior abdominal wall lie in a transverse direction and are therefore divided by a vertical incision. Suture closure of a vertically placed wound places suture material between these fibers, as opposed to the placement of suture material around these fibers as would be done in closing a transverse incision. Furthermore, tension lines lie mediolateral in vertically placed incisions and craniocaudal in transversely placed incisions. For these reasons, many surgeons believe that sutures

placed perpendicularly to muscle fibers in transverse incisions are more secure and less liable to cut through fascia.

- A number of retrospective clinical studies and a meta-analysis have concluded that the transverse incision is superior to the vertical incision with regard to long-term and short-term outcomes, including postoperative pain, pulmonary complications, and frequencies of incisional hernia and burst abdomen. However, the vertical incision is still the most commonly performed incision in general surgery. This discrepancy is explained by a number of deficits in study design and analysis.

Midline versus Paramedian Incisions

The vertical incision can be divided into three main subtypes: midline, medial paramedian, and lateral paramedian. The **theoretical** advantage of the paramedian incision over a midline incision is a diminished risk of wound dehiscence and incisional hernia. The paramedian incision enters the abdomen through dissection of the rectus muscle from its anterior and posterior sheaths. Upon closure, the rectus muscle should resume its original place and splint the defects in the anterior and posterior rectus fascia. In actuality, however, when these incisions are reopened, the medial edge of the rectus muscle is invariably noted to be adherent by scar to the posterior sheath incision and does not effectively buttress the wound. The speculative تخميني advantages of the paramedian incision have been investigated in prospective randomized trials demonstrating that the conventional (medial) paramedian incision offers no advantage in wound failure rates when compared to midline or transverse incisions.

Common extra abdominal incisions

Incision for thyroidectomy

The incision is placed in the low anterior neck at the collar line, following an existing skin crease if one is present, and a gentle curve, if not. The incision will vary in length depending on the size of the nodule, the size and shape of the neck, and the surgeon’s preferences. In general, thyroidectomy incisions tend to be between 5 to 10 centimeters in length.

Parotidectomy incision

The incision begins anterior to the superior root of the helix and descends anterior to the tragus. It then is directed behind the lobule of the pinna and can be carried down anteriorly onto the neck as dictated by the need for exposure.

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