



Indications

Perforated Duodenal Ulcer

Duodenal perforations are usually small, measuring less than a centimeter in diameter. While it can be tempting to perform primary suture repair alone, the tissues surrounding the ulcer are invariably stiff and inflamed; thus, repair with an omental patch, also called a Graham's patch, is preferred.

Large duodenal ulcers can be much more challenging to repair. Beware of the large duodenal ulcer that curves over the edge of the duodenum to become confluent with a posterior ulcer, which can be associated with bleeding. There is no easy way to completely close large perforations, which often require extensive duodenal mobilization and closure with a pyloroplasty technique. If all else fails, tube duodenostomy can provide a temporizing measure and lead to formation of a controlled tract which then gradually seals once the tube is removed after several weeks.

Effective medical therapy has significantly diminished the role for vagotomy in this setting. Laparoscopic omental patch repair is a good option in properly selected patients, and may shorten the length of hospital stay.

Preoperative Preparation

- Initiate fluid and electrolyte resuscitation
- Nasogastric suction

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- Preoperative antibiotics
- Monitoring of hourly urine output and acidosis as indicated

Pitfalls and Danger Points

- Inadequate fluid and electrolyte resuscitation prior to induction of anesthesia
- Closure of perforation under tension

Operative Strategy

The most important initial step of the operative strategy is to determine, on the basis of the principles discussed above, whether the patient should be treated by patch repair or resection. On technical grounds alone, large defects may be better handled by resection and reconstruction than by attempted repair. If it appears that repair of a duodenal ulcer would cause narrowing and obstruction, resection is safer. An alternative is excising the perforation as part of a pyloroplasty incision (see Chap. 27).

For most perforated duodenal ulcers, an attempt to close the defect by sutures alone often results in the stitch tearing through the edematous tissue. It is preferable to place a plug of viable omentum over the defect and use through-and-through sutures to hold the omentum in contact with the wall of the duodenum. This practice avoids tension on the sutures. It is important to irrigate the abdominal cavity thoroughly with large quantities of saline to remove the contamination prior to placing sutures.

Documentation Basics

- Location and diameter of ulcer in centimeters
- Patch repair versus pyloroplasty versus resection

Operative Technique

Incision

A midline incision from the xiphoid to the umbilicus provides good exposure and can be made rapidly.

Identification of Perforation

The perforation is almost always located on the anterior portion of the first part of the duodenum just after the pylorus (Fig. 30.1). It will often be partially sealed by omentum, liver, or gallbladder. Palpating along the greater curve of the stomach till the pylorus is felt and, then, carefully examining the surface of the duodenum immediately distal will usually reveal the ulcer easily. If this area is not the site of the perforation, carefully examine the entire stomach up to the esophagus and include the entire posterior surface of the stomach in the lesser sac. If this is negative, other sources of perforation should be considered, and the incision extended if necessary to permit examination of the entire small intestine and colon.

Manually move the nasogastric tube distal to the perforation to ensure the repair is well drained, and ask the anesthesiologist to tape it in this location.

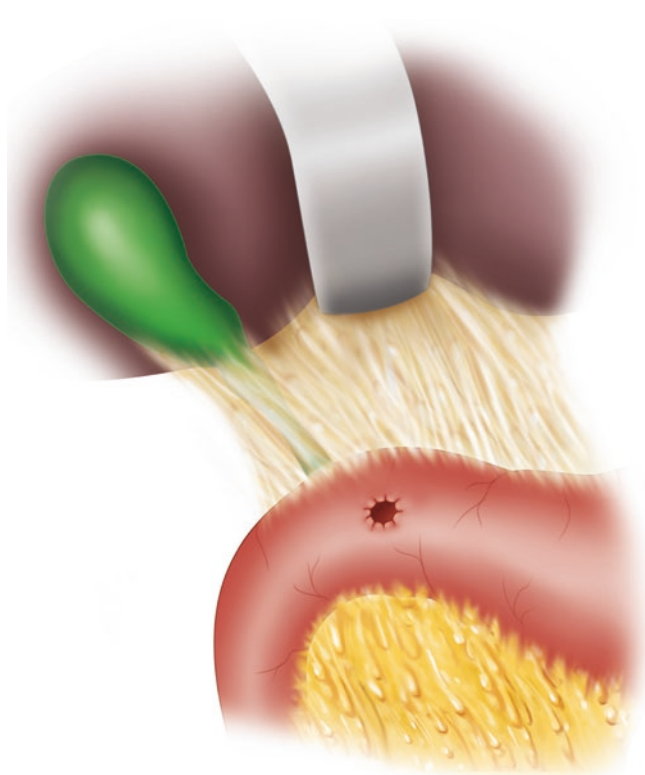


Fig. 30.1

Patch Repair of Perforation

Identify an area of omentum with sufficient laxity to raise a tongue of tissue that will comfortably sit over the perforation. This should be at least 4 cm wide by 6 cm long, and lie comfortably in place without undue tension. Use ligatures (2-0 or 3-0 silk) to divide this tongue from surrounding omentum, taking care to preserve the vascular supply.

Place a 3-0 suture on an atraumatic needle beginning at a point about 5 mm superior to the perforation. Bring the stitch out about 5 mm distal to the perforation, staying superior to the perforation. Leave the ends untied and tag with a hemostat for ease of identification. Next, place two similar sutures, one directly across the perforation and one immediately inferior to it.

Next, place the tongue of omentum over the perforation. Tie the three sutures over the plug of omentum to fasten it in place (Figs. 30.2 and 30.3). Using braided filament allows for a snug grasp of the omentum without cutting into it. I recommend using sutures of different colors (purple dyed vicryl, black silk, green polyester, and undyed white vicryl all work well and are usually readily available) for each suture, to minimize the risk of accidentally tying the wrong ends together. It is *not* necessary to approximate the margins of the hole in the duodenum but only to cap it with viable omental tissue.

Abdominal Closure

Close the midline incision without drainage using the modified Smead-Jones technique as described in Chap. 3. Unless

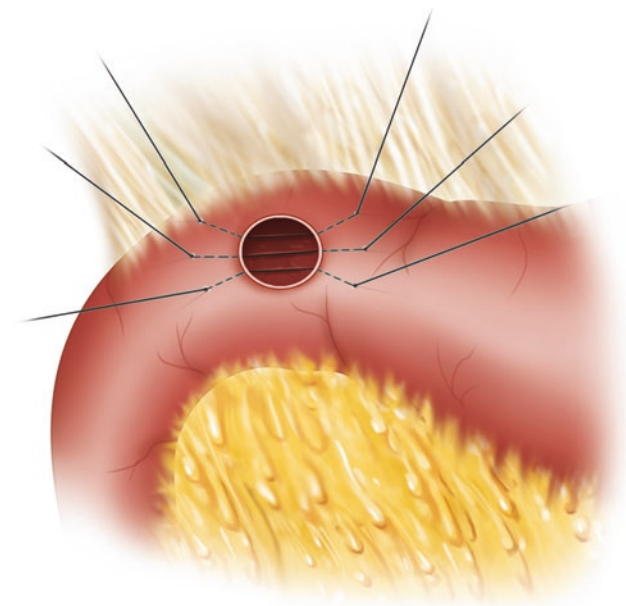


Fig. 30.2

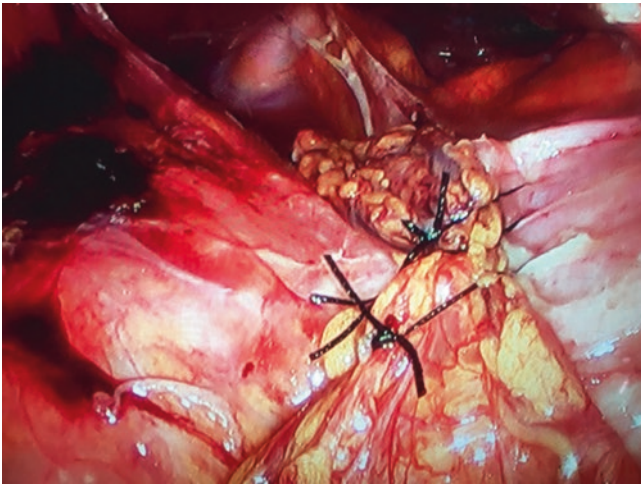


Fig. 30.3

the patient has advanced peritonitis, the skin may be closed in routine fashion. Closed suction drains have not been shown to reduce surgical site infection, and are not necessary.

Postoperative Care

- Nasogastric suction – the authors' practice is to maintain NPO with NG suction for 4 days and obtain a contrast study through the nasogastric tube at completion of this period. If there is no evidence of leak, remove the tube and start clear liquid diet. If this is tolerated, the patient may be discharged home. Slowly advance diet at home over the next week.
- Test for *Helicobacter pylori* and treat if positive.
- Intravenous fluids while NPO.

Complications

- *Subphrenic and subhepatic abscesses* occur mainly in patients whose operations have been delayed more than 8–12 h after the perforation.
- *Duodenal obstruction*, caused by the plication, should be suspected if gastric emptying has not returned to normal by the eighth or ninth postoperative day. It may be confirmed by a gastrointestinal contrast study.
- *Delay in healing* may occur, and be demonstrated by persistent leak on contrast study. Continue NPO and reassess in several days. In patients who were previously malnourished, parenteral nutrition may be required until the perforation is sealed.
- *Reperforation* of the duodenal ulcer occurs in rare cases, and the surgeon must be alert to detect this complication. When it does occur, gastric resection is mandatory if there is to be any hope of stopping the duodenal leak.

Further Reading

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