



Choledochoduodenostomy: Surgical Legacy Technique

92

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Indications

- Common bile duct (CBD) stasis with sludge or primary or recurrent stones (only if the bile duct is more than 1.5 cm in diameter)
- Doubt that all CBD stones have been removed (only if CBD is >1.5 cm in diameter)
- Constriction of distal CBD because of chronic pancreatitis as an alternative to stenting or to Roux-en-Y bypass

Contraindications

- CBD diameter <1.5 cm
- Acute inflammation or excessive fibrosis in duodenal wall
- Carcinoma of the pancreatic head when stenting is not successful (hepaticojejunostomy Roux-en-Y is our preferred bypass procedure for pancreatic carcinoma obstructing the CBD. It is a safer operation, and the anastomosis is not obstructed by the advancing growth of the malignancy.)

Preoperative Preparation

- Perioperative antibiotics
- Vitamin K in jaundiced patients
- Nasogastric tube

Pitfalls and Danger Points

- Anastomotic stoma too small, resulting in postoperative recurrent cholangitis
- Diameter of CBD too small

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- Anastomotic leak, duodenal fistula
- Postoperative “sump” syndrome in which debris accumulates in the distal common duct

Operative Strategy

Both end-to-side and side-to-side techniques have been described. This chapter describes the simplest procedure, in which a side-to-side anastomosis is created. The procedure can also be done laparoscopically, but requires a high degree of facility in laparoscopic suturing (see references at the end).

Size of Anastomotic Stoma

As the anastomotic stoma after side-to-side choledochoduodenostomy permits passage of food from the duodenum into the CBD, it is important that the anastomosis be large enough to permit the food to pass back freely into the duodenum. Otherwise, food particles partially obstruct the anastomotic stoma, accumulate in the distal duct, and produce recurrent cholangitis. If the surgeon constructs an anastomosis with a stoma 2.5 cm or more in diameter, postoperative cholangitis is rare. The size of the stoma may be estimated postoperatively by an upper gastrointestinal barium radiographic study.

Obviously, if the diameter of the CBD is small, a large anastomotic stoma is difficult to achieve. Transduodenal sphincteroplasty (see Chap. 80) is thus a better surgical option for the patient with a small CBD.

Location of the Anastomosis

There are several alternative locations for incisions in the CBD and duodenum. If postoperative anastomotic leakage is

to be prevented, it is vitally important that these incisions be made in tissues of satisfactory quality and that there be no tension on the anastomosis.

A problem occurs when the surgeon has made one incision in the CBD in the vicinity of the cystic duct for the CBD exploration and a second (duodenal) incision opposite the ampulla for an impacted ampullary calculus. Under these conditions, even with an extensive Kocher maneuver, it may not be possible to approximate these two incisions by suturing because there is too much tension on the anastomosis. In this situation, a Roux-en-Y choledochojejunostomy or a sphincteroplasty is preferable. When the possibility of a choledochoduodenostomy is anticipated prior to the CBD exploration, make the incision in the CBD near the point where it enters the sulcus between the pancreas and the duodenum. This facilitates constructing the anastomosis described in this chapter.

When the incision in the CBD has been made in a more proximal location, test the mobility of the duodenum after performing a Kocher maneuver. If the duodenum is easily elevated to the region of the CBD incision, a choledochoduodenostomy by the method illustrated below in “Alternative Method of Anastomosis” is acceptable. There must be no tension on the anastomosis.

Preventing the Sump Syndrome

Sporadic reports have appeared describing the accumulation of food debris or calculi in the terminal portion of the CBD following choledochoduodenostomy. Such an accumulation produces intermittent cholangitis and has been called the “sump syndrome.” Several techniques have been advocated to prevent it. All are more complex than the technique described here.

In the simplest variation, the CBD is divided and the distal portion oversewn. The proximal portion is anastomosed to the duodenum to create an end-to-side, rather than a side-to-side, choledochoduodenostomy. Alternatively, the proximal CBD may be anastomosed to a Roux-en-Y limb of jejunum. This construction completely prevents food from entering the CBD and provides the lowest incidence of sump syndrome.

Documentation Basics

- Findings
- End-to-side versus side-to-side anastomosis

Operative Technique

Incision

A right subcostal or a midline incision from the xiphoid to a point 5 cm below the umbilicus is suitable for this operation. Divide any adhesions and explore the abdomen. Perform a complete Kocher maneuver. If the diameter of the CBD is less than 1.5 cm, do *not* perform a choledochoduodenostomy.

Choledochoduodenal Anastomosis

Free the peritoneum over the distal CBD. Make an incision on the anterior wall of the CBD for a distance of at least 2.5 cm. This incision should terminate close to the point where the duodenum crosses the distal CBD. Make another incision of equal size along the long axis of the duodenum at a point close to the CBD (Fig. 92.1). Insert the index finger into the duodenum and palpate the ampulla of Vater to be certain a carcinoma of the ampulla has not been overlooked.

Place guy sutures at the midpoints of the lateral and medial margins of the CBD incision. Apply traction to these guy sutures in opposite directions to open up the choledochotomy incision (Fig. 92.2). One layer of interrupted 4-0 Vicryl

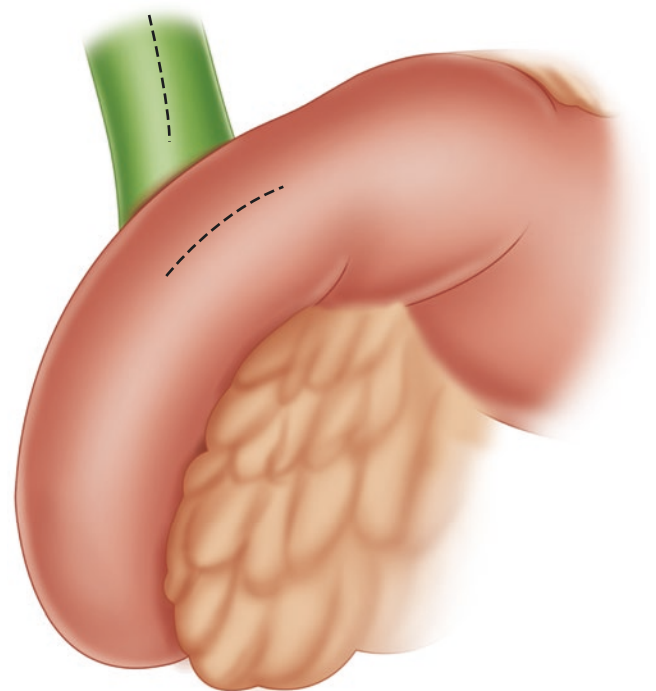


Fig. 92.1

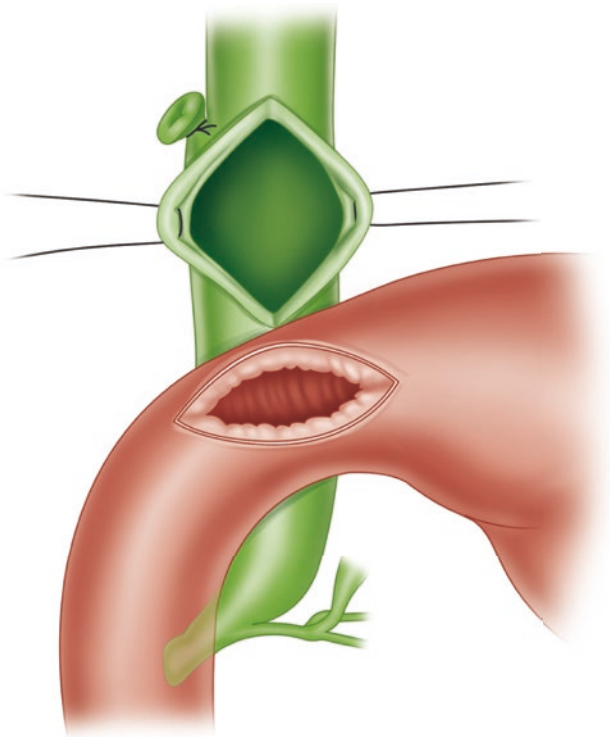


Fig. 92.2

sutures is used for this anastomosis. Insert the first stitch of the posterior layer approximating the midpoint of the duodenal incision to the distal margin of the choledochotomy. Tie the stitch with the knot inside the lumen. Insert additional stitches that go through the full thickness of the duodenum and the CBD (Fig. 92.3), until the entire posterior layer has been completed. Cut all of the sutures except the most lateral and most medial stitches. Approximate the proximal margin of the choledochotomy with the same suture material to the midpoint of the anterior layer of the duodenum and tie this stitch so it inverts the mucosa of the duodenum (Fig. 92.4). Continue to insert interrupted through-and-through sutures, until the anterior layer has been completed (Fig. 92.5). This anastomosis should be completed without tension.

Alternative Method of Anastomosis

In some cases, the surgeon elects to perform a choledochoduodenal anastomosis after making a choledochotomy incision in a location too far proximal on the CBD to accomplish the anastomosis by the above technique. In this case, enlarge the choledochotomy so it measures at least 2.5 cm in length.

Next, perform a thorough Kocher maneuver to increase the mobility of the duodenum. Then move the duodenum

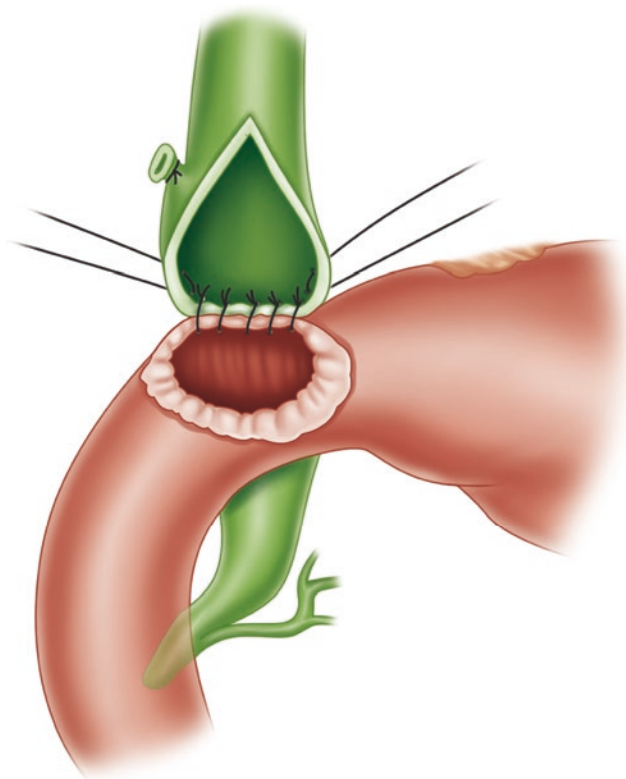


Fig. 92.3

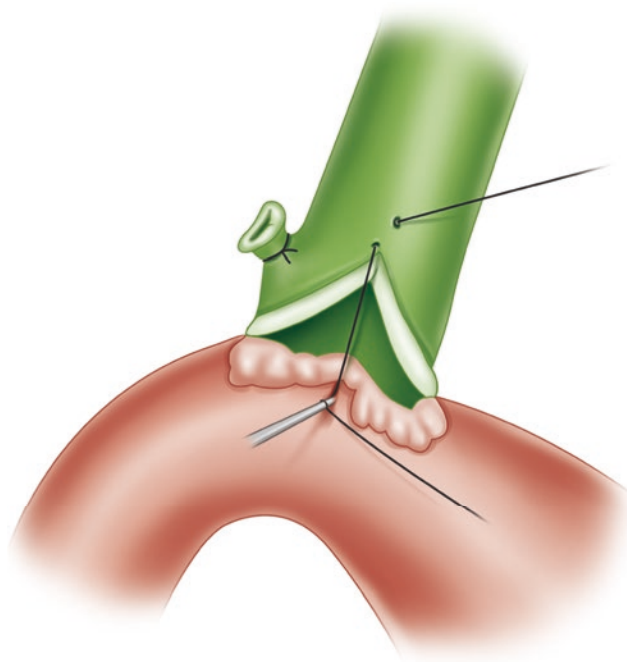


Fig. 92.4

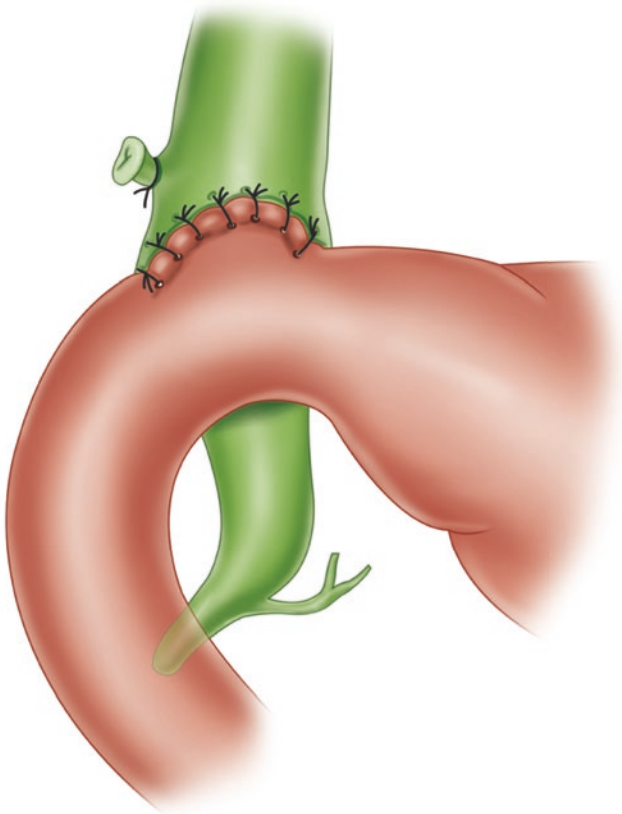


Fig. 92.5

toward the choledochotomy incision and determine which portion of the duodenum is most suitable for a side-to-side anastomosis *without tension*. If tension cannot be avoided, perform a Roux-en-Y anastomosis.

Make an incision in the duodenum parallel to the choledochotomy and approximately equal in length (Fig. 92.6). Approximate the posterior layer with interrupted sutures and tie them (Fig. 92.7), with the knots inside the lumen. Leave the tails of the most cephalad and most distal sutures long, but cut all other sutures. Bisect the anterior layer of the anastomosis and insert a 4-0 PG Lembert suture to approximate the midpoint of the CBD incision to the midpoint of the duodenal incision. Tie this suture so the duodenal mucosa is inverted. Insert additional sutures of the same type to complete the approximation. The knots are on the outside surface of the anastomosis for the anterior layer. Because the CBD is quite large in these cases and the duodenal wall is free of pathology, no T-tube or other stent is necessary.

Drainage and Closure

As bile has an extremely low surface tension, there is a tendency for a small amount of this substance to leak out along the suture

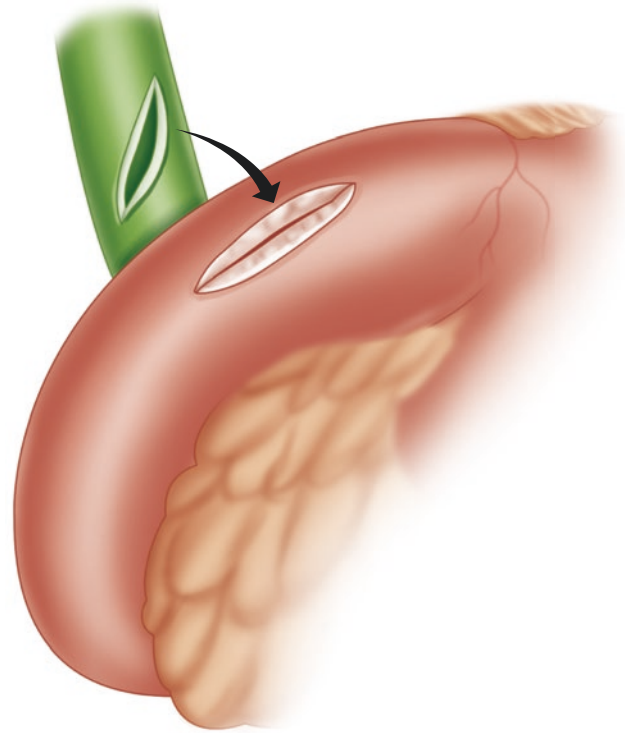


Fig. 92.6

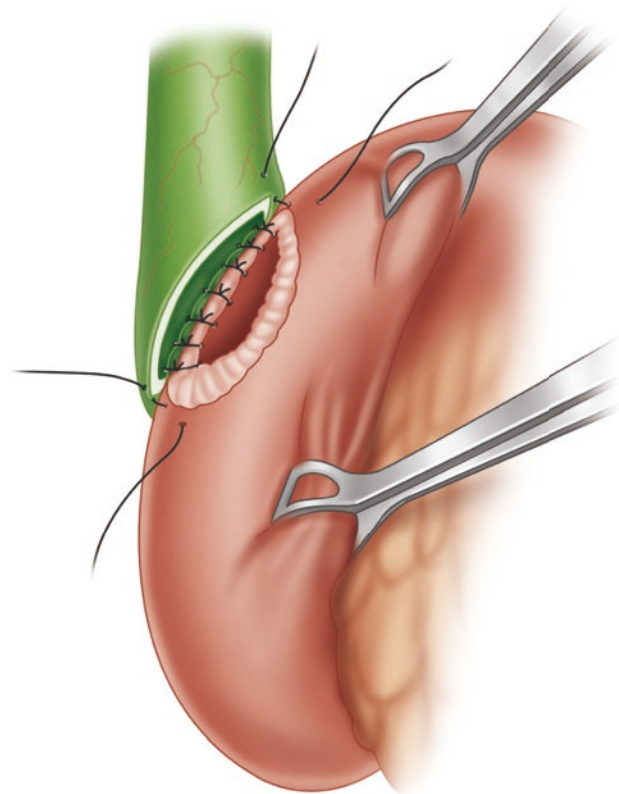


Fig. 92.7

holes during the first day or two following a biliary tract anastomosis. For this reason, insert a closed-suction drainage catheter through a puncture wound in the right upper quadrant and bring the catheter to the general vicinity of the anastomosis.

Postoperative Care

- Continue nasogastric suction if necessary.
- Leave the closed-suction drain in place for 5–7 days.

Complications

- Duodenal fistula
- Subhepatic abscess
- Late development of cholangitis, owing to the anastomotic stoma being too small
- Late development of “sump” syndrome

Further Reading

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