

Use of a polytetrafluoroethylene tube and patch in the repair of a difficult duodenal stump

SUMMARY

In the cases where a primary anastomosis is unable after a duodenal resection, special care must be taken to avoid any complication in the duodenal stump such as suture dehiscence. Wall inflammation is an important factor in the development of this complication. We report a case of a 35-year-old woman who had previously undergone to pyloric exclusion due to a wall defect occurred after a bilio-digestive anastomosis, which complicated with a posterior duodenal stump dehiscence. The acute edema of the stump walls that resulted after it because exposure to bile conducted to heroic measures for its closure: first, the use of a polytetrafluoroethylene tube as duodenostomy and posteriorly a patch of the same material for its final closure. Both gave successful results in the repair of a refractory duodenal stump dehiscence.

Index: Duodenal defect s Duodenal stump insufficiency s Dehiscence s Polytetrafluoroethylene tube s Polytetrafluoroethylene patch
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INTRODUCCION

A duodenal wall defect is an uncommon finding, even in abdominal trauma surgery. Insufficiency of the sutures is not an unusual postoperative complication and indeed a really challenge for all surgeons, especially when leading factors such as gut wall inflammation are present. We wish to communicate the successful results obtained with a polytetrafluoroethylene tube used to exteriorize a duodenal stump that suffered dehiscence of the sutures several times, and a patch of the same material used to cover the duodenal defect once the wall edema disappeared.

CASE REPORT

A 35-years-old woman was admitted in our hospital on June 22nd of 1992, with a clinical picture suggesting obstructive jaundice and acute cholangitis. Sixty days before admission, open cholecystectomy and common bile duct (CBD) exploration were performed because of acute calculous cholecystitis and chole-docolithiasis in a county hospital. A T-tube was left in place during fifteen days postoperatively and was withdrawn

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without performing a radiologic control.

On admission the patient was icteric, and presenting fever, chills, nausea, vomiting, and malaise. Blood tests revealed leukocytosis, conjugate hyperbilirubinemia, and a positive blood culture for *Salmonella typhi*.

A percutaneous transhepatic cholangiography showed a common hepatic duct stricture, dilatation of intrahepatic bile ducts, and residual choledocholithiasis. Intravenous fluids and antibiotics were given and the patient was prepared for surgical intervention.

The choledocus, stomach, duodenum and hepatic flexure of the colon were involved in dense adhesions in the subhepatic region. All of them were mobilized with mechanical and digital dissection. CBD exploration was carried out. Two stones were located in the distal CBD being impacted the distal one.

After a failed attempt to extract instrumentally the impacted stone and a papillotomy, a side-to-side hepaticojejunostomy was performed and Penrose drains were left in the subhepatic region.

A liver biopsy showed lymphocytic and polynuclear infiltrate surrounding the intrahepatic bile ducts, microscopic evidence of chronic cholangitis.

Four days postoperatively, there was a persistent leakage of bile through the drains that increased progressively. She was reoperated and a duodenal wall defect (1st portion) of approximately 2x1 cm was found.

Duodenal borders of the defect were edematous, making a primary repair unable. A partial section of the duodenum was made with closure of the gastric antrum and the duodenal stump, followed by a gastrojejunostomy.

Ten days later, bile drainage was evident again and increased as well. Reoperation disclosed dehiscence of the duodenal stump and a bile leak at the anastomosis line of the

hepaticojejunostomy, which was repaired. Also, a jejunostomy was made for enteral feeding.

Seven days posteriorly, bile leaks reappeared and a fourth abdominal exploration was made, finding dehiscence of the hepaticojejunostomy plus insufficiency of the gastric and duodenal sutures. The bilio-digestive anastomosis was withdrawn replacing it with a T-tube and the duodenal and gastric borders were repaired again.

The patient was doing fine, but at the seventh day postoperatively she presented bile leak, again. At the new abdominal exploration, duodenal stump insufficiency was evident.

Because of the presence of wall edema, difficulty in closing the borders of the duodenal stump, and the risk of involving the ampulle of Vater in the duodenal closure, a polytetrafluoroethylene tube (GORE-TEX[®], Soft Tissue Patch, W.L. Gore & associates Inc.) was sutured to the duodenal borders of the defect with a continuous suture of polypropilene.

It was exteriorized through the lateral abdominal wall with a Foley catheter as a duodenostomy (fig. 1). Also the T-tube was replaced for a new one, and the jejunostomy was retired.

The patient improved clinically and thirty days following the last operation she was reoperated in order to close the duodenal defect. The duodenal wall was not edematous and in addition it had grown around the tube.

The tube was withdrawn together with the Foley catheter. The neoduodenal tissue enabled us to repair the duodenal defect, moreover, a polytetrafluoroethylene patch was sutured covering the duodenal stump (fig. 2).

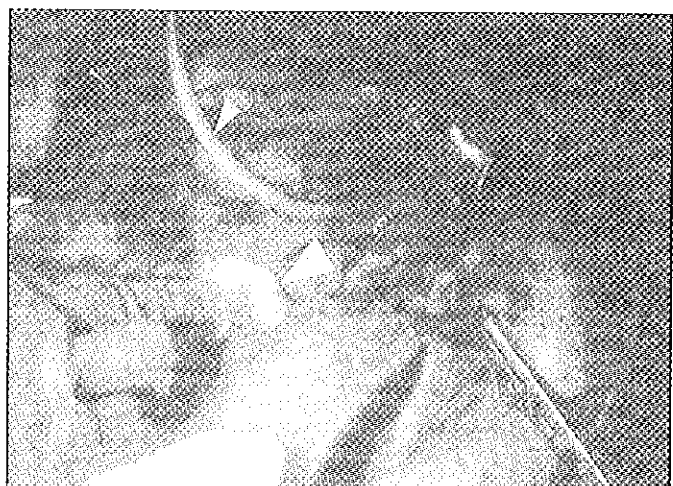
Another patch was placed in the antral sutures where a small dehiscence was found.

During her hospitalization course, she received multiple

Figure 1: Polytetrafluoroethylene tube sutured to the duodenal stump, and being exteriorized through the abdominal wall (big arrow) as duodenostomy. T-tube in the common bile duct (small arrow).



Figure 2: Polytetrafluoroethylene patch sutured at the duodenal defect (big arrow), 30 days after the placement of the tube. T-tube in the common bile duct (small arrow).



blood and plasma transfusions. She also presented infection of the abdominal wall sutures, the same that was treated with periodical cures. A gastric fistula presented, and it was used as a gastrostomy for retrograde decompression, exteriorizing it with a Foley catheter. The patient had a good evolution; she was sent to her home with periodical checkouts of the surgical wound and the gastrostomy. Sixty days later the gastrostomy became bigger, and the Foley catheter's balloon got loose, allowing the escape of fluids and electrolytes with the subsequent deterioration of the patient's health. The patient was taken to a local general hospital presenting anemia, where she died of acute pulmonary edema due to parenteral nutrition overload. Necropsy showed that the duodenal closure healed adequately.

DISCUSSION

The management of large duodenal wall defects caused by trauma, dehiscence of a pyloroplasty, leaking duodenal stump, cholecystoduodenal fistula or neoplasia is really a challenge for all surgeons. This is supported by the fact that the clinical manifestations of duodenal injury are minimal and vague due to the retroperitoneal position of the duodenum, and the complexity of its treatment in some cases.[1, 2]

Many techniques have been employed experimentally and clinically for repairing such defects varying from simple suture; grafting with a serosal or omental patch; a pedicled mucosal graft from jejunum or gastric body with a gastric "island" flap; duodenal decompression and even pancreaticoduodenectomy. Resection of the duodenal defect and end-to-end anastomosis is the first treatment

alternative in wall defects greater than 3 cm, but it is difficult to carry out in defects located in the second duodenal portion.[2-4]

In our patient, even when the defect was small, primary closure was not possible because of the friability of the duodenal wall. After the resection of the duodenal defect, the end-to-end anastomosis was not able due to the inflammation of the borders, so the closures of both duodenal and gastric ends were performed, and a gastrojejunostomy was made.

A common complication of the duodenal stump is the insufficiency of the sutures, the same that occurred several times in our patient. Inflammatory infiltration is a leading factor in the incompetence of the stump sutures, especially after duodenal ulcer surgery.[5]

The uses of mechanical sutures have shown a higher incidence of dehiscence when is performed with resorbable instead of metallic staples.[6]

In our patient the duodenal wall was edematous due to the effect of the bile and pancreatic enzymes leading to a duodenal stump difficult to repair. *Ascaris lumbricoides* and other enteral parasites are rare causes of postoperative duodenal stump dehiscence, in areas where these parasites are endemic.[7]

Studies in dogs have shown that the use of a polytetrafluoroethylene graft is an acceptable option for repairing the digestive and biliary tract, allowing anastomosis for the proper biliary drainage.[8, 9, 10]

Although, patches of the same material are a good choice for the repair of a duodenal defect, presenting a low percentage of complications including the dehiscence of the sutures.[11] In this case the use of a polytetrafluoroethylene tube allowed a duodenal decompression leading to a successful duodenal healing, and posteriorly, a safe duodenal repair with a patch of the same material.

Resumen

En los casos en los que una anastomosis primaria no es posible luego de una resección duodenal, se debe tratar de evitar complicaciones en el muñón duodenal como una dehiscencia de las suturas.

La inflamación de la pared duodenal es un factor importante para el desarrollo de esta complicación. Reportamos el caso de una mujer de 35 años de edad a la cual se le realizó una resección duodenal con exclusión pilórica debido a un defecto en la pared del duodeno ocurrido luego de una anastomosis bilio-digestiva, la cual se complicó con una dehiscencia del muñón duodenal. El edema de las paredes duodenales resultado de su exposición con la bilis, nos condujo a medidas heroicas para el cierre final del muñón: primero, el uso de un tubo de poly-tetrafluoroethylene como una duodenostomía y posteriormente un parche del mismo material para su cierre final. Ambos dieron resultados satisfactorios en el tratamiento de una dehiscencia refractaria del muñón duodenal.

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