EVALUATION OF PATTERN OF BILE DUCT INJURY IN LAPAROSCOPIC CHOLECYSTECTOMY

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INTRODUCTION

HISTORICAL PERSPECTIVE OF BILIARY TRACT INJURY:

The possibility of inadvertent injury to adjacent structures has been a part of surgery since the time of the barber surgeons. From the moment on July15, 1882, when Langenbuch performed the first planned cholecystectomy, the possibility of injury to the biliary ducts or hepatic arteries or both existed (***Braasch, J.W 1994***).

After the first cholecystectomy by Langenbuch in 1882, it took nearly 15 years for the number of reported cholecystectomies to reach 100. Thus, the first operations for reconstruction of the biliary tract or repair of damage to the biliary tract understandably were not reported until 1905 when Mayo described two cases of chole dochoduodenostomy in repair of a damaged common duct that occurred during the course of routine cholecystectomy (***Braasch, J.W 1994***).

The first hepaticojejunostomy using the Roux-en-Y loop was performed by Monprofit and reported in 1908. Another similar case was reported by Dahl in 1909. A further refinement was reported by Cole et al, who created a protruding mucosal segment at the site of anastomosis which was thought to ensure a mucosa-to-mucosa anastomosis. Smith subsequently modified this technique

and created what he called a mucosal graft anastomosis which had more support from the jejunal wall (***Smith R, 1969***).

The history of the use of trans anastomotic stents has been interesting and varied. These stents have included rubber, a Murphy button, Vitallium and bouncing clay, Cuffed rubber tubes, and Y- shaped tubes. However the Kehr or T-tube remains the standard stenting device for most anastomoses (***Braasch J.W, 1994***).

Imaging of the biliary tract has been intimately connected with the repair of strictures. The first imaging of the biliary tract was reported in 1924 by Graham and Cole. Biliary duct imaging was first accomplished in 1918 by the injection of petrolatum and bismuth into a biliary fistula. Percutaneous transhepatic cholangiography was reported by Carter & Saypol. Retrograde cholangiography by duodenal endoscopy was shown to be possible by Mc Cune et al in 1968 and Oi in 1970. Imaging is important in defining the exact situation in the proximal ductal system when the surgeons need the location of the ducts and the confidence in knowing that normal ducts are reachable in instances of high strictures (***Braasch, J.W 1994***).

Dissection at the hilus of the liver can be a difficult part of stricture repair. Couinaud in 1954 and Hepp and Couinaud in 1956 described the hilar plate and the long extrahepatic course of the left hepatic duct both of importance in stricture repair because the hilar plate must

be dissected and the left duct is available for exist of internal stents or for use in biliary tract anastomoses in instances of high strictures. Also in instances of high obstructions, Soupault and Couinaud in 1957 described a technique for finding much larger ductal structures in the left lobe by following the round ligament to the origin of the segment III duct (***Hepp J, Couinaud C, 1956***) (***Soupault R, Couinaud C 1957***).

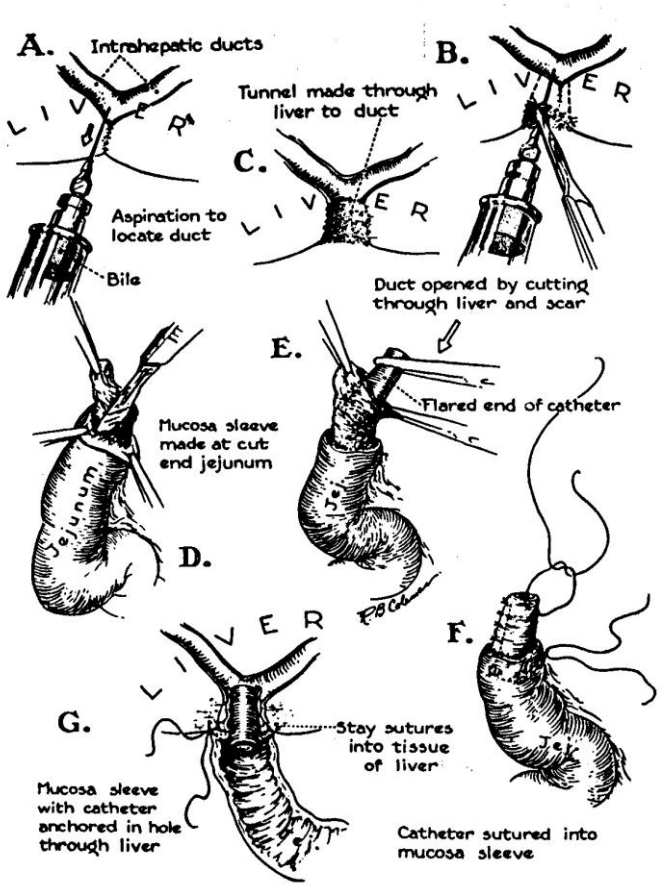

Fig. 1 Cole's mucosal tongue hepaticojejunostomy. (from Cole WH: strictures of the common duct)

Mucosa of the biliary tract is sensitive to ischemia and responds to anoxia by desquamation and fibrosis. It is likely that long dissections of the proximal duct led to ischemic necrosis at the anastomosis and subsequent stricture. The consequence of this discovery was that surgeons no longer dissected 1cm of duct in preparation for its anastomosis but kept the dissection just enough to produce duct length for a one layer anastomosis that is at 2mm.

With the advent of laparoscopic cholecystectomy, a new surge in the incidence of biliary tract injury has occurred. This increase seems to be setting, as surgeons become more familiar with laparoscopic techniques and especially with the safety precautions that must be taken as they become known (***Rossi RL et al., 1992***).

AIM OF THE WORK

Our aim is to discuss the extent and type of bile duct injury & its influence on the following management and prognosis in post laparoscopic cholecystectomy.

ANATOMY OF THE GALL BLADDER AND BILIARY DUCTS

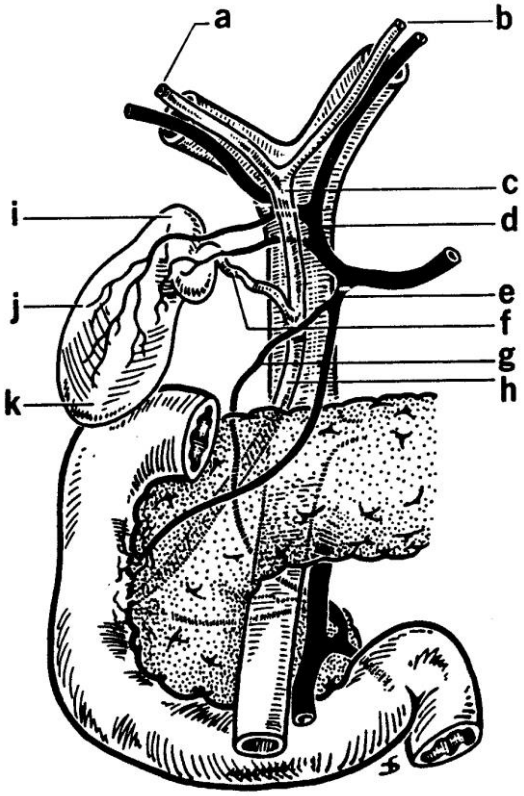

Fig.2 Anterior aspect of the biliary anatomy: a, right hepatic duct; b, left hepatic duct; c, common hepatic duct; d, hepatic artery; e, gastroduodenal artery; f, cystic artery; g, retroduodenal artery; h, common bile duct; I, neck of the gall bladder; j, body of the gall bladder; k, fundus of gall bladder

1- GALL BLADDER

The gall bladder is a sac-like or pear-shaped sac, hollow organ that lies in a fossa on the under surface of the liver. It's position is the anatomical boundary between the right and the left lobes of the liver.

The gall bladder is attached to the liver by a loose areolar tissue rich in small vessels and lymphatics***(Roslyn and Zinner 1994)***.these lymphatics and veins connect the venous and lymphatic system of the gall bladder with those of the liver. Rarely, one or more small accessory bile ducts pass through this tissue to enter the gall bladder directly ***(Hollinshead 1982)***.

The average measure of the gall bladder is 7 to 10 cm long, 3 cm broad at its widest part. Its capacity is 30-50 ml in normal conditions ***(Williams and Dyson, 1992)***.

THE FUNDUS

It is the rounded blind end of the gall bladder, which usually but not always projects a little beyond the sharp lower border of the liver and touches the parietal peritoneum of the anterior abdominal wall at the tip of the right ninth costal cartilage where the transpyloric plane crosses the right costal margin at the lateral border of the right rectus sheath ***(Thompson 1988)***.

THE BODY

It is the largest segment of the organ, it's free surface lies in close approximation to the first portion and superior segment of the second portion of the duodenum. This surface is also related to the hepatic flexure and right one third of the transverse colon with some loops of small bowel that reside in the right hypochondrium ***(Dowdy etal., 1962).***

THE INFUNDIBULUM

It is the tapering, transitional area between the body and the neck of the organ and on occasions it completely hides the cystic duct completely from View. It is attached to the right lateral surface of the first part of the duodenum by a relatively avascular, double layered peritoneal fold, which is derived from the inferior margin of the right free border of the hepatoduodenal ligament, helps guide the surgeon to the major vascular and ductal structures lying in the biliary fossa ***(Dowdy et al 1962)***

THE NECK

It is formed by the rapid tapering, of the infundibulum the neck is usually directed superiorly, dorsally and to the left, but it may be directed transveresly or inferiorly. It occupies the deepest part of the cystic fossa, Situated close to the right lateral free border of the hepatoduodenal ligament ***(Harold, 1987).***

HARTMANN' SPOUCH

It is a symmetric Small bulbous diverticulum ,which arises from the right Side of the neck and typically lies on the inferior Surface of the gall bladder this anatomic Site is clinically significant because of it's proximity to the duodenum and because Stones may become impacted in the infundibulum and obstruct the cystic duct (***Roslyn and Zinner,1994***) however the, hartmann's Pouch is not a constant feature of the normal gall bladder ,and is always associated with a Pathological Conditions. It is frequently a convenient area to put on traction to improve Exposure of the neck and the cystic duct. It may be adherent to the Common bile duct, making cholecystectomy difficult and Predisposing to Common duct injury ***(Thompson, 1988).***

2- CYSTIC DUCT

It arises from the neck or infundibulum of the gall bladder and Passes backward and downward and to the left to join the Common hepatic duct. It's lumen usually measures 1-3 mm and it's length is Variable (about 2.5 to 4 cm) depending upon the type of Union with the Common hepatic duct the mucosa of the cystic duct is arranged in spiral folds known as the Valves of heister, it's wall is Surrounded by a sphincteric structure called the sphinctre of Lutkens these Valves Serve to Prevent excessive distension or Collapse of cystic duct. The distal end of the cystic duct is Usually found in the free border of hepatodnodenal ligament, this site is Known as the