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FEATURES OF RECONSTRUCTIVE OPERATIONS IN IATROGENIC DAMAGE TO EXTRAHEPATIC BILE DUCTS

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Annotation. Presented Results of treatment of 102 patients with intraoperative bile duct injuries. Bile duct injuries during CE were 1.3% and were observed during LCE in 2/3 of cases, with 59.8% of cases involving peripheral bile duct injuries and 48.2% involving main bile duct injuries. High Roux -en-Y GEA using precision equipment is the operation of choice for intraoperative CE intersection and excision. Reconstructive surgeries are indicated for marginal CE injury; BBA and GDA application are not recommended due to the high risk of anastomotic strictures. The treatment and diagnostic algorithm using endoscopic transduodenal interventions, ultrasound- guided puncture methods, and laparoscopy made it possible to avoid relaparotomy in 96.7% of patients with intraoperative injuries to the peripheral bile ducts. Correction of bile duct damage when detected intraoperatively is accompanied by a significantly lower number of complications in the immediate (10%) and late (25%) periods of treatment than when detected in the postoperative period (38.1% and 41.2%, respectively, with a mortality rate of 14.3%).

Key words: intraoperative bile duct injury, surgical tactics, treatment results.

The decisive factors in the genesis of bile duct damage during cholecystectomy are technical and tactical errors of surgeons, as well as the lack of adequate technological support. Factors contributing to damage to the bile ducts include inflammatory and infiltrative changes in the neck of the gallbladder, poorly controlled bleeding, the presence of a cystic- choledochal fistula, abnormal location of the cystic duct and artery (Nazirov F.G. et al ., 2019; Galperin E.I., 2009; Gassaniga G ., 2018; Schiano Di Visconte , 2012).

Even minor injuries to the main bile ducts, but diagnosed late, can pose a threat to life and lead to severe complications in the postoperative period: widespread or limited peritonitis, the formation of subhepatic abscesses, external biliary fistulas, post-traumatic cicatricial strictures. In case of severe injury to the bile ducts, its treatment is

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extremely difficult, and the results, both in the immediate and remote periods, cannot be considered good. Mortality after reconstructive surgeries is 8-17% (Skipen Nichitailo M.E. et al ., 2014).

Despite certain successes achieved in this complex area of surgery, unsatisfactory results even in the most experienced surgeons are observed in an average of 10% of cases (Trovanis et al ., 2006). Such patients require repeated, sometimes multiple reconstructive surgeries (not always successful) and they are rightly called " biliary cripples" (Chernyshev V.N., 2020; Ahrendt S. & Pitt H . 2019).

From the point of view of treatment outcomes, the timing of detection of damage to the interseptal septum is of fundamental importance. A distinction is made between "fresh" damage to the interseptal septum and posttraumatic cicatricial strictures of the bile ducts and biliodigestive ducts. "Fresh" damage, in turn, is divided into those diagnosed on the operating table and those detected in the early postoperative period (Galperin E.I., 2003).

Objective of the study: To improve the results of correction of intraoperative damage to the bile ducts by optimizing surgical tactics.

Material and methods of the study. The work is based on the results of treatment of 102 patients with intraoperative bile duct injuries in the Samarkand branch of the RCEMC and in the clinic of Samara State Medical University in the period from 2012 to 2021. Bile duct injuries were noted in 102 (1.3%) patients after 7925 CE, including 65 (63.7%) after LCE, 24 (23.5%) after minilaparotomic CE (MLCE), 13 (12.8%) after CE from wide laparotomic access. Among the examined patients, there were 81 women (79.4%), 21 men (20.6%). The age of the patients ranged from 19 to 76 years. Of 102 patients with intraoperative bile duct injuries , 61 (59.8%) patients had peripheral bile duct injuries, including 19 with cystic duct stump insufficiency, 37 with bile duct injuries in the gallbladder bed, and 5 with drainage dislocation in the GC. In all these patients, the clinical picture of peripheral bile duct injuries was manifested by bile leakage in the early postoperative period. Damage to the main bile ducts (MSD) after cholecystectomy was detected in 41 (48.2%) patients. Of these, 20 (48.9%) had MSD injuries during surgery and 21 (51.2%) in the early postoperative period. The assessment of MSD injuries was carried out according to the classification of E.I. Galperin (2009). Marginal or partial damage to the bile ducts was detected in 8 (19.5%) patients, clipping or ligation of the duct without its intersection was detected in 7 (17.1%) patients, intersection in 3 (7.3%) patients, excision of the bile duct in 11 (26.8%), excision and ligation in 12 (29.3%). In 12 (29.2%), the damage was detected at the level of "+2", in 18 (43.9%) - "+1", "0" - 7 (17.1%), "-1" - 2 (4.9%), "-2" - 2 (4.9%).

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In the early postoperative period, intraoperative damage to the bile ducts in 13 (12.7%) patients manifested itself as clinical signs of increasing mechanical jaundice, in 30 (29.4%) patients as biliary peritonitis, in 48 (47.1%) patients there was profuse bile leakage through drainage from the abdominal cavity, and in 11 (10.8%) patients there were two or more complications.

The diagnostic methods used were aimed at identifying, differentially and topically characterizing damage to the bile ducts and sources of bile leakage . Various special research methods were used: ultrasound, computed tomography (CT), magnetic resonance cholangiopancreatography (MRCP), intraoperative cholangiography , PCCG, RCP , laparoscopy.

Injuries to the peripheral bile ducts in 61 patients were manifested by the clinical picture of bile leakage ; tactical approaches primarily consisted of identifying the source and possible intra-abdominal complications (biliary peritonitis, biloma). For this purpose, indications for the use of high-tech minimally invasive surgical methods were optimized - relaparoscopy , transduodenal endoscopic interventions, puncture methods under ultrasound control.

In case of bile leakage with the flow rate up to 100 ml/ day (31 patients) in the absence of signs of peritonitis, satisfactory condition of patients, absence of changes in blood tests, dynamic observation with mandatory ultrasound monitoring and conservative treatment were carried out - antispasmodics, infusion , anti-inflammatory and antibacterial therapy. In 21 patients, the treatment was effective, bile leakage through the drainage progressively decreased and completely stopped within 3-7 days. Six patients required punctures of the biloma under ultrasound control in order to evacuate the accumulation of bile in the subhepatic space, and in 1 patient the cause of bile leakage was the loss of drainage from the common bile duct .

In another 4 patients, conservative treatment was also ineffective, bile leakage continued with a flow rate of up to 200-250 ml per day, and they underwent RPCG and EPST. In these 2 patients, the cause of bile leakage was incompetence of the cystic duct stump, and in another 2 patients, additional ducts of the gallbladder bed. After endoscopic drainage of the biliary system and installation of nasobiliary drainage, bile leakage in these patients stopped on the 2nd-5th day.

In case of bile leakage with the flow rate up to 500 ml/ day (n =30) with the failure of the cystic duct stump due to choledocholithiasis and biliary hypertension with external bile leakage , RPCG with EPST and nasobiliary drainage in 5 patients was the final method of stopping the bile leakage . Endoscopic transduodenal intervention stopped the bile leakage in 4 patients with drainage falling out of the common bile duct

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In 8 cases of patients with cystic duct stump insufficiency after LCE, relaparoscopy and repeated clipping of the cystic duct were performed. Also, in case of bile leakage from aberrant bile ducts in 11 patients, they were clipped during relaparoscopy , in 1 with peritonitis - during relaparotomy . Relaparotomy , choledocholithotomy with drainage of the common bile duct and sanitation of the abdominal cavity were performed in 1 patient with bile peritonitis.

intraoperatively . In 2 patients, the CC was transected, the common hepatic duct was excised in 11 patients, and a parietal marginal injury was found in 7 patients. Injury localization: the common bile duct (CBD) in 6 patients, the common hepatic duct (CHD) in 8 patients, the CHD and bifurcation area in 4 patients, and the RA with confluence destruction in 2 patients. All patients underwent restorative and reconstructive surgeries. Of these, 9 patients underwent restorative surgeries and 11 patients underwent reconstructive surgeries. In case of marginal partial injury to the common hepatic duct (CH), sutures (5/0 prolene) were applied to the damaged duct wall on a Kehr drainage in 7 patients. Of these, 5 patients had small parietal injuries to the common bile duct with a diameter of no more than 5 mm. The defect was sutured transversely, making an additional opening in the bile duct below the injury site to leave a T-shaped tube in the lumen of the CBD. Biliobiliary anastomosis (BBA) was performed in 2 patients with transection of the common hepatic duct (CHD) . Biliodigestive anastomosis (BDA) was performed in 11 patients. Of these, 2 patients underwent HepDA , 9 patients underwent hepaticojejunostomy (HepEA) with a Roux-en -Y loop of the small intestine. Injuries to the interseptum were detected in the early postoperative period, according to our observations, in 21 patients. In 5 patients with clipping or ligation of the bile duct without its transection, the ligature or clips were removed and the hepatic duct was drained externally. In 2 patients, after removal of the ligature, BBA was performed. During excision of the HC and ligation of the proximal duct stump (6 patients), BBA was performed in 2 patients. Reconstructive surgeries were performed in 4 patients: 2 - HepEA according to Roux on TPCD, 1 - without it, and 1 patient was given HepDA . In peritonitis with pronounced infiltrative changes in the subhepatic region, 3 patients with excision of the HC first underwent external drainage of the proximal duct stump, and then reconstructive surgeries were performed. HepEA was given to 2 patients , 1 patient refused the second stage of the operation. In the early postoperative period, damage to the interventricular septum in 5 patients manifested itself clinically bile leakage and mechanical jaundice. These patients underwent two-stage surgery : first, external drainage of the proximal stump of the duct, then 2-3 months after the inflammatory -infiltrative process of the subhepatic region had subsided. HepEA was applied to 5 patients (2 with TPDC, 2 without TPDC).

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Results and discussion. We assessed the effectiveness of the treatment of peripheral bile duct injuries in 61 patients based on the cessation of bile flow through the abdominal cavity drainage; endoscopic transduodenal interventions were the final method of stopping bile leakage in 50% of patients ; if repeated intervention in the abdominal cavity was necessary, bile leakage was stopped by relaparotomy in 19 (63.3%) patients. The frequency of relaparotomy was 6.6% (2 patients).

Among 41 operated patients with injuries of the interventricular septum, various types of complications in the immediate postoperative period were noted in 10 (24.4%) patients.

In the group patients where the damage to the interventricular septum was detected intraoperatively, in the immediate postoperative period specific complications were detected in 2 (10%) patients. In 1 patient, partial anastomotic failure was noted after the imposition of HepEA . Bile leakage was observed through the safety drainage, which stopped on its own on the 8th day. In 1 patient, after the imposition of HepEA on the TPCD, bile leakage with an admixture of blood was observed through the frame drainage in the postoperative period, which did not cause a catastrophic threat to the patient's life. Hemobilia was stopped after conservative treatment.

In the group patients, where the injuries were detected in the immediate postoperative period, complications were observed in 38.1% of cases in the early stages after repeated operations. A fatal outcome was observed in 3 (14.3%) patients: in 1 patient due to acute renal failure, 1 due to acute cardiovascular failure, 1 due to advanced peritonitis and multiple organ failure. In the immediate postoperative period, in 3 patients after the imposition of HepEA (2 patients) and HepDA (1 patient), partial failure of the BDA was observed, which in 2 cases was manifested by external bile leakage through the safety drainage and in 1 - biloma subhepatic region. Bile leakage stopped spontaneously on the 7th and 15th days after surgery, and the biloma was drained under ultrasound control. In 1 patient, after the imposition of HepEA, hemobilia was observed in the immediate postoperative period , which did not respond to conservative therapy and required relaparotomy .

Of the 41 operated patients, the remote results of surgical treatment were assessed in 32 (78.1%). The observation periods for patients ranged from 1 to 10 years. The average observation period was 6.45 ± 0.58 years.

In the group patients where damage to the interventricular septum was detected intraoperatively, in the late postoperative period, 15 (75%) patients had a satisfactory result and 5 (25%) patients were diagnosed with cicatricial strictures of the bile ducts and BDA.

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In the group patients where damage was detected in the immediate postoperative period, a satisfactory result was noted in 9 (52.9%) patients out of 17 patients followed up in the remote period. In 7 (41.2%) observations, cicatricial strictures of the bile ducts and BDA were detected.

Conclusions

1. Damage to the bile ducts during CE was 1.3% and was observed in 2/3 of cases during LCE, with 59.8% of cases involving damage to the peripheral bile ducts and 48.2 % to the main bile ducts.

2. In intraoperative intersection and excision of the GC, the operation of choice is high Roux -en-Y GEA using precision technology. Reconstructive operations are indicated for marginal damage to the GC; the application of BBA and GDA is not recommended due to the high risk of developing anastomotic strictures.

3. The treatment and diagnostic algorithm using endoscopic transduodenal interventions, ultrasound- guided puncture methods and laparoscopy made it possible to avoid relaparotomy in 96.7% of cases with intraoperative injuries to the peripheral bile ducts.

4. Correction of bile duct damage when detected intraoperatively is accompanied by a significantly lower number of complications in the immediate (10%) and late (25%) periods of treatment than when detected in the postoperative period (38.1% and 41.2%, respectively, with a mortality rate of 14.3%).

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