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Therapeutic and Diagnostic Algorithm for Postoperative Bile Leakage on the Background of Obesity in Urgent Surgery

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Abstract The authors of destructive forms of ACC on the background of obesity found that the development and degree of postoperative BL is interconnected with the degree of obesity, the nature of pathomorphological changes in the gallbladder, and the method of surgical intervention. As a result, a therapeutic and diagnostic algorithm of actions in the prevention, timely diagnosis and treatment of this contingent, including some tactical and technical aspects, has been developed, which in general has made it possible to optimize surgical tactics and improve the results of surgical treatment of this category of patients. It was also found that the volume and nature of reoperation does not depend on the volume of postoperative BL, but on the cause of its occurrence. So, in case of damage to the tubular structures of the biliary tract, the operation of choice today in the vast majority of cases is to perform relaparotomy, for other reasons (BL from the SDC stump, Luschka's passages and the bed of the gallbladder) - relaparoscopy.

Keywords Postoperative bile leakage (BL), Obesity, Cholelithiasis (GSD), Acute calculous cholecystitis (ACC), Relaparotomy, Relaparoscopy, Reoperations

1. Introduction

Currently, more than 10% of the world's population suffers from cholelithiasis (GSD) and ranks third in the overall structure of diseases after cardiovascular diseases and diabetes mellitus [2,5]. Today, these rates are about 1.5 million per year and exceed the number of all other abdominal interventions, including appendectomy [4,9]. More than 2.5 million such interventions are performed annually in the world [6]. Acute calculous cholecystitis (ACC) is accompanied by high postoperative mortality - 0.9 to 14.6%, which in patients older than 60 years reaches 20-23%, among which are predominantly obese people [1,8]. Minimally invasive operations - laparoscopic (LCE) or open CE from a mini-access - have long become the "gold standard" of surgery and rationally complement each other. The situation is alarming when the frequency of relaparotomies and postoperative mortality in case of bile leakage after urgent operations remains stably high [3,7,12]. According to a number of authors, the frequency of relaparotomy ranges from 0.5 to 13.6%. In the prevention of the development of intra-abdominal complications, the tactical and technical aspects of the primary operation play an important role, and in cases of a complication, its timely diagnosis, adequate, sparing reoperation and complex intensive therapy are decisive [11].

Thus, today there is no single doctrine in diagnostic and surgical tactics, and treatment and diagnostic algorithms require improvement. Issues of the effectiveness of the use of relaparotomy and relaparoscopy in postoperative bile leakage (BL) against the background of obesity in urgent surgery remain problematic. The present study is devoted to the solution of these questions.

The aim of the research. Improving the results of relaparotomy and relaparoscopy in case of bile leakage in urgent surgery by developing a treatment and diagnostic algorithm of actions.

2. Material and Methods

The work is based on the results of a retrospective and prospective analysis of the surgical treatment of postoperative BL in 72 patients with ACC for the period 2016–2023. According to the purpose and objectives of the study, a large cohort of the studied patients was conditionally divided into two groups, which were the subject of this study:

- control group - (2016-2019) - 43 (59.7%) patients who underwent a retrospective analysis of the results of surgical treatment in compliance with traditional approaches;
- the main group - (2020-2023) - 29 (40.3%) patients who underwent a prospective study of surgical treatment using an optimized surgical approach.

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The distribution of the studied patients, we carried out according to the WHO International Age Classification (2021).

3. Results and Discussion

In the control group, at the age of 19-44 years (young age), postoperative BL was found in 5 (11.7%) patients, at the age of 45-59 years (mature age) - in 26 (60.5%) and 60 years and older (old age) - in 12 (27.9%). At the same time, men made up 20 (46.5%), and women - 23 (53.5%). A retrospective analysis showed that this complication is most often observed in people of the most able-bodied age, which is of great economic importance. Nevertheless, often (27.9%) postoperative bile leakage was also noted in people over 60 years of age, which is of great social importance for our society. It was also found that the ratio of men to women was almost 1:1, although women suffer from gallstone disease 4-5 times more often.

A retrospective analysis of the results of surgical treatment showed that out of 922 patients operated on urgently for ACC, for the period from 2016 to 2019 (4 years), postoperative BL was observed in 43 (4.7%) cases. In addition, in the control group in patients with postoperative BL, obesity of the first degree was noted in 11 (25.6%), the second – in 24 (55.8%) and the third - in 8 (18.6%). The occurrence of postoperative BL on the background of obesity was noted during urgent surgical interventions for ACC, complicated by a simple form in 14 (32.6%) patients, phlegmonous - in 21 (48.8%) and gangrenous form - in 8 (18.6%) patients. At the same time, postoperative BL of grade I was observed in 17 (39.5%) patients, grade II – in 19 (44.2%), and grade III – in 7 (16.3%) patients.

In the control group, out of 922 cases, LCE was performed in 401 (43.5%) patients, mini-access CE in 142 (15.4%), and TCE in 379 (41.1%) patients. After LCE, postoperative BL was noted in 14 (3.5%) patients, where relaparotomy was performed in 9 (2.2%) cases with a fatal outcome in 3 (0.7%) cases and relaparoscopy in 5 (1.2%) cases. After CE from the mini-access, postoperative BL was noted in 21 (14.8%) patients, where relaparotomy was performed in 15 (10.5%) cases with a fatal outcome in 3 (0.7%) cases and relaparoscopy in 6 (4.2%) cases.). After TCE, postoperative BL was observed in 8 (2.1%) patients, where relaparotomy was performed in 6 (1.5%) with a fatal outcome in 2 (0.5%) cases and relaparoscopy in 2 (0.5%) patients.

In general, in the control group, postoperative BL was observed in 43 (4.7%) patients, where relaparotomy was performed in 30 (3.3%) with a fatal outcome in 9 (1.0%) and relaparoscopy in 13 (1.4%) %) of patients. Postoperative purulent-septic (wound) complications were noted in 34 (3.7%) patients, and general postoperative complications - in 63 (6.8%) with a fatal outcome in 6 (0.7%) cases.

A retrospective analysis of the results of urgent surgical interventions in destructive forms of ACC against the background of obesity was the basis for studying shortcomings and omissions, which was the basis for the development of a treatment and diagnostic algorithm for optimizing surgical tactics and developing measures to prevent the occurrence of postoperative BL, including an improved method of "submersible" invagination CDA method.

According to the proposed treatment and diagnostic algorithm for postoperative BL (biliary peritonitis) in patients after urgent surgical interventions for ACC on the background of obesity, along with the analysis of complaints, the collection of anamnesis with the establishment of the features of the primary operation (LCE, CE from a mini-access or "traditional" CE), repeated ECG, clinical and repeated laboratory studies (general blood and urine tests, biochemical analyzes) were carried out.

When diagnosing concomitant therapeutic pathologies, they were corrected in the Department of Surgery together with therapists, cardiologists, endocrinologists, and so on (depending on the nature of the pathology). In parallel, ultrasound was performed as the most accessible and non-invasive method of radiation diagnosis. Since our contingent consisted of patients with varying degrees of obesity, we used the Kelly formula for determining body mass index (BMI) [10].

When establishing obesity of the 1st degree (BMI 30-34), when conducting a study to clarify the diagnosis and determine the surgical tactics, Clexane therapy was started - 20 mg s / c before reoperation, 20 mg after reoperation, as well as cardiomagnyl therapy - 0.075 mg / day, 1 time starting from the first day of the postoperative period. In case of obesity of the 2nd degree (BMI 35-39), clexane therapy was started - 40 mg s / c before reoperation, 60 mg in the first after reoperation, as well as cardiomagnyl therapy - 0.075 mg/day, starting from the third day after reoperation. With obesity of the 3rd degree (BMI 40), Clexane therapy was started - 40 mg s / c before reoperation, one hour after reoperation and on days 2-3 - 20 mg, 1 time per day. Therapy with cardiomagnyl - 0.075 mg/day was carried out from the 4th day after reoperation.

Relaparoscopy was used for diagnostic purposes, when the presence of limited peritonitis was assumed in the unfavorable course of the postoperative period, and non-invasive diagnostic methods did not provide the expected information. The main advantage of laparoscopy was that the diagnostic stage in most patients was completed by a therapeutic laparoscopic aid.

In the absence of free fluid in the abdominal cavity, the usual complex of postoperative procedures (symptomatic therapy) should be continued.

With ultrasound, the determination of traces of fluid or its presence is less than 100 ml, active monitoring is necessary in dynamics, with the continuation of conservative therapy. Protease inhibitors and antisecretory drugs should be added, and gastric aspiration should be performed using a permanent decompression tube.

A limited accumulation of free fluid in the subhepatic space of more than 100 ml and up to 500 ml allows one to suspect limited damage and limitation of the process.

With the spread of free fluid throughout the abdominal cavity, exceeding the volume of more than 500 ml, it makes it possible to judge the occurrence of a life-threatening complication. This contingent, on an emergency basis (according to indications), should undergo CT or MSCT. To determine the nature and level of the defect and choose the appropriate treatment tactics, it is necessary to perform endoscopic retrograde cholangiography (ERCG). Intraoperative cholangiography (IOCG) through the stump of the cystic duct makes it possible to establish the cause of hypertension, but it is difficult to eliminate it laparoscopically, especially in such unfavorable conditions. It's easier and safer to do it in the "open" way.

Further tactics of laparoscopic intervention depends on the results of cholangiography and consists in clipping the cystic duct, draining it, or expanding the scope of the operation with a possible transition to laparotomy. After eliminating the cause of bile leakage, the abdominal cavity is washed, drains are installed in the subhepatic space and in places of potential accumulation of effusion.

All these procedures are carried out with active preoperative preparation for reoperation, together with an anesthesiologist -resuscitator, as well as relevant specialists (depending on the presence and nature of concomitant therapeutic pathology). Unfortunately, this research is not always possible. In this case, relaparoscopy as a diagnostic intervention is fully justified, which in certain clinical situations can be a method of reoperation.

Suspicion of postoperative BL, diagnosed by drainage discharge or due to complex clinical, laboratory and instrumental diagnostics, with signs of peritoneal irritation, is an indication for relaparoscopy.

The lack of effect of antispasmodic therapy within 1-2 days should be considered as an indication for relaparoscopy, even with a small (up to 100 ml), but stable volume of bile secretions.

The question of urgent relaparoscopy arises in cases where the volume of bile released through the drainage on the first day after surgery exceeds 100 ml, or ultrasound detects free fluid in the abdominal cavity. This may be due to damage to the main bile ducts, failure or defect in the stump of the cystic duct. In the first case, relaparoscopy is unpromising. This requires intervention by laparotomy access. Relaparoscopy should be preferred for BL from the cystic duct stump.

Re-intervention was performed within the period from 2 days to 7 days after the operation. Pathological changes detected during relaparoscopy in the next three days after surgery are usually manifestations of diffuse peritonitis with bile effusion, more or less widespread loose adhesions and fibrinous overlays. The unions delimiting bile during the first week remain friable, easily and bloodlessly exfoliate.

In case of incompetence of the cystic duct stump (SCD) or loss of drainage from the common bile duct, in this contingent it is optimal to perform relaparoscopy with clipping of the SC stump or re-installation of the drainage in the choledoch and its re-fixation. Against the background of obesity and the presence of concomitant pathology, relaparotomy can significantly worsen the outcomes of surgical treatment.

In case of bile leakage from the passages of Luschka, in the absence of the effect of conservative therapy, it is also optimal to perform reoperation as a reoperation - relaparoscopy, with suturing, clipping or coagulation.

Limited transection or occlusion of the non-major bile ducts (SCD) is also an indication for relaparoscopy with suturing or clipping on scaffold drainage.

With complete transection or occlusion of non-major SCDs or limited transection of the choledochus, an indication for relaparotomy in the "traditional" way, with suturing on a T-shaped drainage, followed by stenting, is indicated.

With complete intersection or occlusion of the common bile duct, relaparotomy with choledochoduodenoanastomosis (CDA) or choledochojejunoanastomosis (CEA) "end-to-side" "submerged" sutures according to our method, with nasogastro - or - juno-biliary drainage is indicated. In certain clinical situations, performing a reconstructive restorative operation (RRO) is indicated.

It should be noted that in all cases of reoperation, surgery should be completed with drainage of the abdominal cavity, according to generally accepted canons, incl. subhepatic space and Winslow's space according to the type of "flow system".

In this contingent, due to the high probability of developing thromboembolic complications (TEC), along with conventional therapy, as mentioned earlier, it is necessary to continue specific and nonspecific prophylaxis.

Adhering to the developed diagnostic and treatment algorithm of actions, as well as optimizing some tactical and technical aspects from 2019 to 2023, in the main group, postoperative BL was observed in 29 (2.3%) patients, where relaparotomy was performed in 10 (0.8%) fatal in 1 (0.1%) and relaparoscopy in 19 (1.5%) patients. In the main group, postoperative purulent-septic (wound) complications were noted in 19 (1.5%) patients, and general postoperative complications - in 33 (2.6%) with a fatal outcome in 3 (0.2%) cases.

Thus, after urgent surgical interventions for destructive forms of ACC against the background of obesity over the subsequent similar period of time, the incidence and development of postoperative BL decreased from 43 (4.7%) to 29 (2.3%) - (2-fold decrease), the frequency of performing relaparotomies decreased from 30 (3.3%) to 10 (0.8%) - (4-fold decrease) and deaths from 8 (0.9%) to 0.1%) - (10-fold decrease). At the same time, the frequency of purulent-septic (wound) complications decreased from 34 (3.7%) to 19 (1.5%) - (2.5 times decrease), and general complications decreased from 63 (6.8%) to 33 (2.6%) - (2.6 times decrease) and the frequency of deaths - from 6 (0.7%) to 3 (0.2%) - (3.5 times decrease).

4. Conclusions

In destructive forms of ACC on the background of obesity, the development and degree of postoperative BL is

interconnected with the degree of obesity, the nature of pathomorphological changes in the gallbladder, and the method of surgical intervention. As a result, a therapeutic and diagnostic algorithm of actions in the prevention, timely diagnosis and treatment of this contingent was developed, which, in general, made it possible to optimize surgical tactics and improve the results of surgical treatment of this category of patients. Также установлено, что объем и характер реоперации зависит не от объема послеоперац ионного BL, а от причины его возникновения. So, in case of damage to the tubular structures of the biliary tract, the operation of choice today in the vast majority of cases is to perform relaparotomy, for other reasons (BL from the CDS stump, Luschka's passages and the bed of the gallbladder) - relaparoscopy.

REFERENCES

[1] Aimagambetov M.Zh., Abdurakhmanov S.T., Bulegenov T.A. Peculiarities of diagnostics and surgical treatment of acute destructive calculous cholecystitis in overweight and obese patients. Literature review // Science and Health. -2019. 3 (v.21). pp. 54-67.

[2] Beburishvili A.G. et al. National clinical guidelines "Acute cholecystitis" [Electronic resource] // All-Russian Public Organization "Russian Society of Surgeons": [website]. - [2015]. - URL: ttp://society-surgeons.rf/upload/acute_ cholecystitis.pdf (accessed 12.09.2019).

[3] Izmailov S.G., Ryabkov M.G., Leontiev A.E. et al. Application of adaptive instruments in surgery of relaporotomy wounds // Kazan medical journal. -2019. -T.100. -#2. -pp. 351-357.

[4] Mishalov V.G., Bondarev R.V., Kondakova E.Yu. et al. Features of surgical treatment of chronic calculous cholecystitis in patients with obesity and ptosis of the anterior abdominal wall after previous operations on the organs of the upper floor of the abdominal cavity. Surgery of Ukraine. -2016. No. 4. pp. 24-29.

[5] Natroshvili A.G., Shulutko A.M., Baichorov E.Kh. et al. Preoperative diagnosis of choledocholithiasis: opportunity and prospects // Med. Bulletin of the North Caucasus. -2021. -vol.16. -#1. –p. 1-5.

[6] Revishvili A.Sh., Fedorov A.V., Sazhin V.P., Olovyannyi V.E. Status of emergency surgical care in the Russian Federation. Surgery. Journal them. N.I. Pirogov. 2019; (3): p. 88-97.

[7] Khadzhibaev A.M., Khadzhibaev F.A., Altiev B.K. et al. Modern methods of treatment of early intra-abdominal complications after cholecystectomy. // Bulletin of emergency medicine. -2019. -7(5). –p. 5-9.

[8] Khokhlacheva N.A., Sergeeva N.N., Vakhrushev Ya.M. Age and gender features of the development of gallstone disease. Archive of internal medicine. -2016. V.6, No. 1 (27). pp. 34-39.

[9] Elshaer M., Gravante G., Thomas K., Sorge R., Al-Hamali S., Ebdewi H. Subtotal Cholecystectomy for «Difficult Gallbladders» Systematic Review and Meta-analysis. JAMA Surg., 2015, No. 150(2), pp. 159–168.

[10] Kelly T, Yang W, Chen CS, et al. Global burden of obesity in 2005 and projections to 2030. Int J Obes (Lond). 2008; 32 (9): 1431-7.

[11] Yasui K., Ishiguro S., Komatsu S. [et al.]. Novel approach to intraoperative peritoneal lavage with an extracorporeal stirring method in laparoscopic surgery for generalized peritonitis: Preliminary results // Asian J Endosc Surg. - 2019. Jan 22.

[12] Zhou C., Guo Q.S., Ling C.C., Wang P. Clinical analysis of transumbilical single-incision laparoscopic cholecystectomy with totally free umbilical ring by conventional instruments // Zhonghua Yi Xue Za Zhi. - 2018 Dec 25. - №98 (48). - P. 3946-3949.