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## CLASSIFICATION OF EXTRAHEPATIC BILE DUCT INJURIES

### ABSTRACT

Currently there are many classifications of intraoperative bile duct injury (IBDI) and its complications. Current classifications are based on different principles of IBDI injury, creating confusion, thus complicating approach to the choice of treatment.

**Keywords:** bile duct injury, surgery, classification of lesions of the extrahepatic bile ducts.

### INTRODUCTION

Classification of bile duct injuries has many modifications [1]. Each of them has its positive and negative sides. Some are built on the topographic principle, with the emphasis on the level of damage of the bile ducts, some reflect the nature of the damage, while others contain section, describing damage to vascular structures, others are very detailed, but at the same time complex and hard to understand.

Diversity of classification leads to confusion, prevents the development of a unified approach in the choice of treatment, as well as complicates the correct assessment and analysis of treatment results in practical surgery. All-purpose classification must clearly delineate the types of damage, its complications, has a division based on regional anatomy principles, reflects the amount and nature of the surgery, understandable to everyone, thus on the basis of which it will be possible to clearly define the treatment policy and prognosis [2]. Unfortunately, to this day, there is no such classification. Most used classification is made by H.Bismuth and P.Majno, modified by S.Strasberg [4]. This classification applies to both "fresh" damage to bile duct, as well as strictures of it due to damage, but does not fully cover all aspects of IBDI damage and its complications [3].

On the basis of the surgical treatment of more than 100 patients with damage of the extrahepatic bile ducts, we have developed the following classification, which takes into account type and level of damage, complications, number and type of surgery.

#### A – aspect of damage

A1 - intersection, excision and damage of 2/3 of the circumference of the duct (treatment of this type of damage is similar to intersection)

intersection (Fig. 1), excision (Fig. 2), damage to more than 2/3 (Fig. 3)

A2 - wound up to 2/3 of the circumference of the duct (Fig. 4)

A3 - duct ligation and clipping (occlusion) (Fig. 5)

A4 - thermal damage to the duct wall and dissection of the duct's lumen, with intraoperative bile leakage (Fig. 6).

A5 - thermal damage to the duct wall with necrosis and perforation of the duct wall in post-operative period (Fig. 7)

A6 - thermal damage to the duct wall without dissection of the duct with subsequent formation of stricture (Fig. 8)

Combined damage types are indicated by reference number of corresponding types of damage. For example: A1+3 denotes the intersection in combination with ligation

#### L - Level of damage and its complications

L1 - the level of the cystic duct and common bile duct (Fig. 9)

L2 - the level of the common hepatic duct to confluence (Fig. 10)

L3 - confluence level (Fig. 11)

L4 - level (one or both) lobar ducts (Figure 12)

#### C – complications of damage

C1 - stricture

C2 - obstructive jaundice

C3 - cholangitis

C4 - liver abscess

C5 –incomplete external biliary fistula

C6 –complete external biliary fistula

C7 - choleperitonitis

C8 - liver failure

O - the number of surgery (O – operation)

The letter "O" is supplemented by number of surgeries in form of fraction, where a numerator is the total number of surgeries, including minimally invasive, and in the denominator is a number of reconstructive surgery.

Thus, according to our classification, it is required to put the primary diagnosis first: eg. "chronic calculouscholecystitis", then intraoperative or penetrating or closed IBDI damage, type of damage A1-6, the level of damage and its complications L1- 4, type of complications C1-8, where there may be a combination of complications, for example: C1, 3 - stricture with cholangitis; the number of surgical interventions as a fraction: eg O2/1 - total number of operations is 2 and one reconstructive surgery.

In our opinion, this classification is the most informative and useful for proper planning and choice of treatment tactics, recording and analysis of treatment results of IBDI injuries and its complications.

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