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Research Article

IMPROVING THE WAY MECHANICAL JAUNDICE IS MODELLED IN EXPERIMENT

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ABSTRACT

Mechanical jaundice is a severe symptomcomplex developing as a complication of some diseases and most frequently accompanies cholelithiasis, benign strictures of choledochiasis, primary and metastatic lesions of hepatopancreatoduodenal organs in malignant neoplasms [1,12]. Biliary outflow disorder leads to biliary hypertension and, as a result, to suppression of hepatocyte function and its death. In most cases, mechanical jaundice is accompanied by cholangitis, cholangiogenic liver abscesses, sepsis, hepatic and

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renal failure, which in turn leads to a number of pathogenic mechanisms leading to general intoxication, coagulation disorders, reduced immune response and multiple organ failure[14].

KEYWORDS

Mechanical jaundice, liver, cholelithiasis, hyperbilirubinemia, Fogarty catheter.

INTRODUCTION

According to the World Health Organisation, liver failure ranks consistently sixth among the causes of death. The number of new cases is estimated to be 250,000 annually, and the three-month mortality rate is as high as 70% (1). As a pathognomonic syndrome in almost all liver and biliary tract diseases, liver failure can be a consequence of mechanical jaundice (45%), activation of viral hepatitis or cirrhosis (19%), toxic liver injury (4%), postoperative complications or trauma (3%) [2,15]. However, hyperbilirubinemia of more than 300 μmol/l is an independent risk factor for mortality, and other criteria for poor prognosis in liver failure syndrome include jaundice more than 7 days before encephalopathy, age > 40 years, and prothrombin time > 50 sec[3,14]. Impaired detoxification status of hepatocytes, ineffectiveness of standard drug therapy, necessitates inclusion of extracorporeal prosthetic liver function options[4,7]. In this regard, at the present stage of hepatology development, research aimed at improving extracorporeal detoxification technologies, in particular, the development of new high-quality hemosorbents based on special types of raw materials and technologies that can improve the removal of toxic metabolites and reduce the risk of development or progression of multiple organ failure, remains promising [5,11].

At the same time for possibility of carrying out of scientific and practical researches on efficiency estimation of various variants of treatment of liver insufficiency syndrome of no small importance have experimental researches with creation of model of this complication. In this article the improved method of modeling the regulated common bile duct obturation to form

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an experimental model of mechanical jaundice (MJ) and hepatic insufficiency is presented[8,14]. Objectives and purpose of the proposed method is simplification of implementation, creation of dosed compression of common bile duct and providing an opportunity to simulate jaundice of different degree of severity[9].

AIM OF THE STUDY

To improve the modelling of mechanical jaundice in the experiment

MATERIALS AND METHODS OF RESEARCH

The studies were carried out in the experimental departments of the State Institution "Vahidov RSNPMCh. V.Vahidov" and Andijan State Medical Institute. The object of research was 4 mongrel dogs. The animals were kept in vivarium conditions in accordance with the requirements of GOST ISO 10993-11-2011 about proper conditions of preparation and supervision of experimental animals. The ISSN 2011 methods and criteria were used to determine acute and chronic toxicity parameters.

RESULTS AND DISCUSSION

To solve these problems, we proposed a method of modeling mechanical jaundice in the experiment, including laparotomy and common bile duct isolation, characterized by that the common bile duct is separated at 1,0-1,5 cm, a vascular Teflon prosthesis with 10-12 mm diameter and 5-10 mm length, longitudinally dissected along its full length is placed under the separated duct, Then we fix the prosthesis above the bile duct by 3-4 stitches with 3/0 Prolene thread, introduce the balloon part of Fogarty catheter between the common bile duct and vascular prosthesis, draw the distal part of Fogarty catheter through contrapperture, suture the abdominal cavity in layers and perform bile duct compression by dosed inflation of the balloon of Fogarty catheter.

Comparative analysis with the closest analogue shows that the method differs in that the common bile duct is separated at 1,0-1,5 cm, the vascular Teflon prosthesis with 10-12 mm diameter and 5-10 mm length, longitudinally dissected along its full length is placed under the separated duct, then the prosthesis is fixed over the duct by sewing the dissected part of the prosthesis with

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3-4 loop stitches using 3/0 Prolene thread, the balloon part of the Fogarty catheter is inserted between the common bile duct and the vascular prosthesis, the distal part of the Fogarty catheter is removed through a contrappertura, the abdominal cavity is sutured in layers, and the bile duct is compressed by dosed inflation of the balloon of the Fogarty catheter. These distinctive features allow us to conclude that the technical solution is new. Causal relationship:

The use of a vascular Teflon prosthesis allows fixation of the balloon part of the Fogarty catheter in the necessary place for bile duct compression not locally, as in ligation or ligature obstruction, but throughout. Elastic balloon of Fogarty catheter excludes damage of common bile duct walls and adjacent organs. In contrast to ligature clamping in which local strangulationobturation of bile duct is formed with possibility of acute ischemia and subsequent formation of stricture, the suggested method provides compression of the duct throughout, and possibility of regulating of obstruction degree allows to avoid LVD damage.

By inflating the balloon of Fogarty catheter located between the vascular Teflon prosthesis and common bile duct, it provides 5-10 mm of compression of the common bile duct. Dosed inflation of the Fogarty catheter balloon makes it possible to simulate mechanical jaundice of varying degrees of severity and to regulate the degree of obstruction.

After the experiment is completed, the balloon is deflated and the catheter is removed without further surgical intervention on the animal. Exclusion of ligation and/or crossing of the common bile duct simplifies implementation of the technique without necessity of restoration of bile passage by repeated reconstructive and reconstructive surgery.

Method is carried out as follows: In in inbred dogs (males and females), weighting from 9000 g, a laparotomy is performed in right subcostal space under intravenous anesthetic, the common bile duct (1) (BCJ) is isolated at 1,0-1,5 cm from duodenum (2) at the distance of 1,0-1,5 cm. A vascular Teflon prosthesis (3) with diameter of 10-12 mm and length of 5-10 mm dissected longitudinally along the entire length is placed under the duodenum. Fixation of the prosthesis over the bile duct is performed by stitching the dissected part of the prosthesis with 3-4 knot stitches. The balloon part of the Fogarty catheter (4) is inserted into the space between the bile

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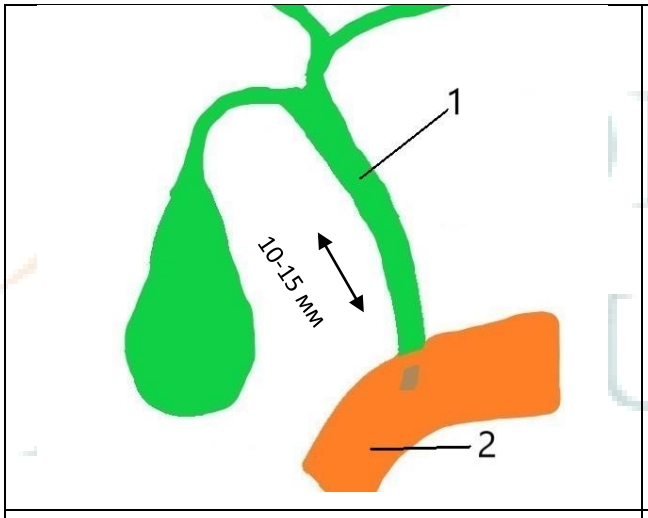
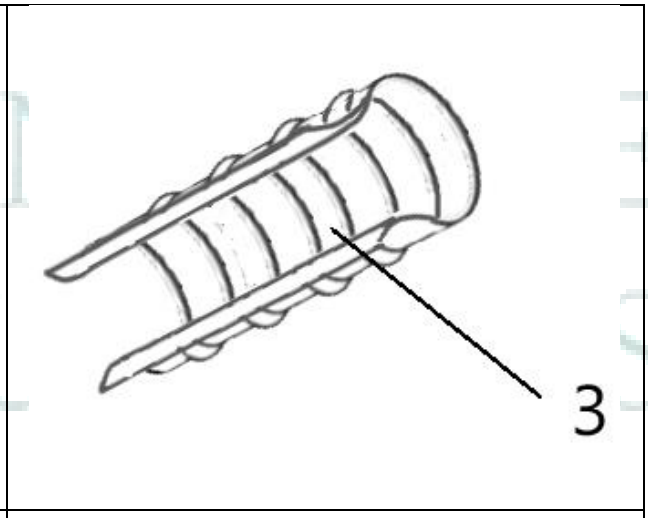
duct and the vascular prosthesis. The wide diameter of the prosthesis ensures free passage of the Fogarty catheter balloon into the lumen of the prosthesis with the passage of VAS. The distal part of the Fogarty catheter (5) is withdrawn through the contrapperture. The animal's abdominal cavity is sutured in layers. The balloon of the Fogarty catheter (4) is then inflated to compress the common bile duct (1). Depending on the volume of the ballooning the degree of narrowing of the common bile duct and the MJ lumen of varying intensity is simulated (Fig. 1). After the end of the experiment the bile passage disturbance, hence mechanical jaundice, is eliminated by deflating the balloon and removing the Fogarty catheter from the animal's abdominal cavity without additional surgical intervention.



Highlighting of VLF over 10-15 mm



Dissection of a vascular prosthesis

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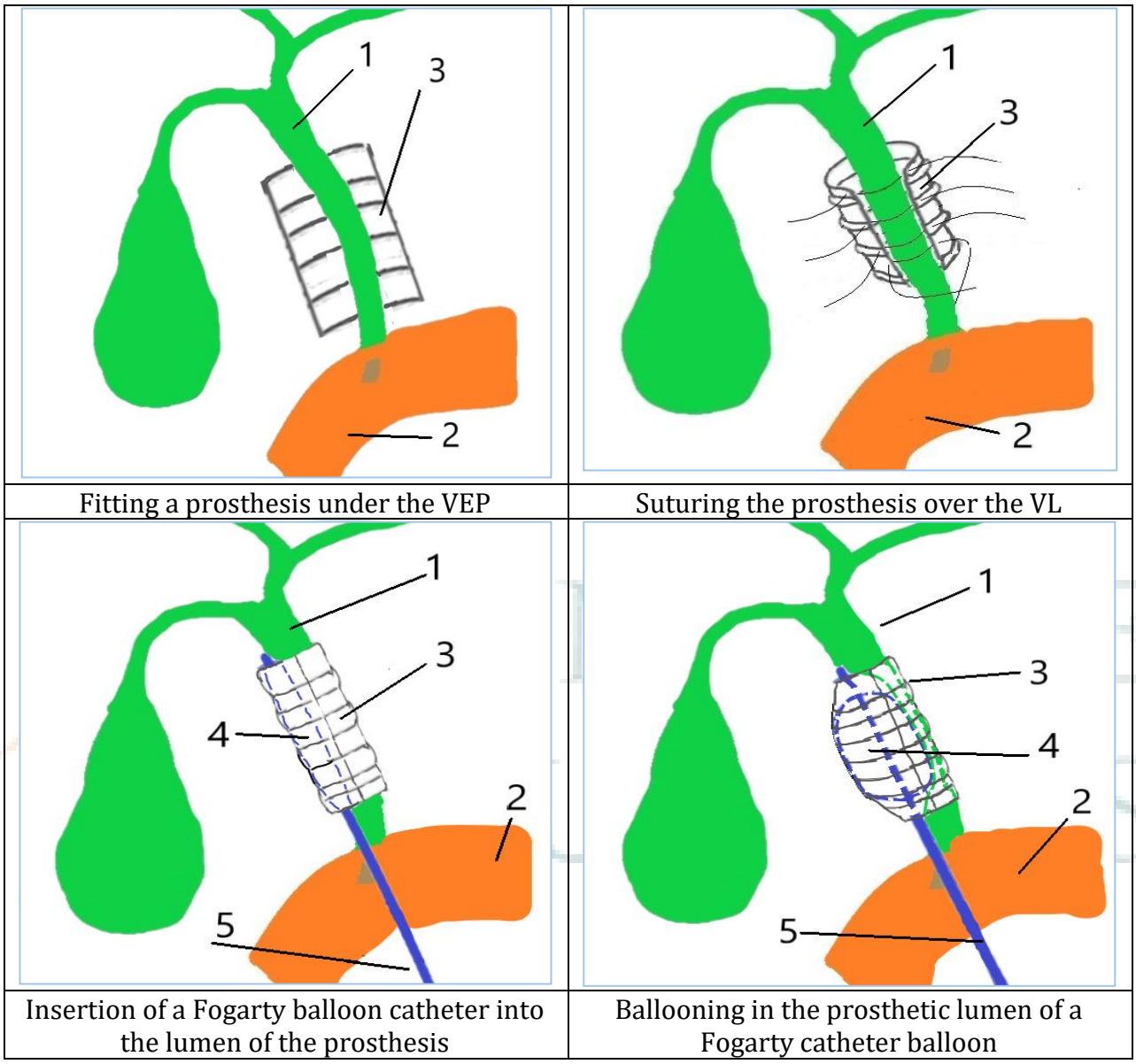

Fitting a prosthesis under the VEP	Suturing the prosthesis over the VL
Insertion of a Fogarty balloon catheter into the lumen of the prosthesis	Ballooning in the prosthetic lumen of a Fogarty catheter balloon

Note: 1 - VLF; 2 - duodenum; 3 - Vascular prosthesis; 4 - Balloon of Fogarty catheter; 5 - Distal part of Fogarty catheter

Figure 1. Schematic representation of the steps in the simulation of mechanical jaundice in the experiment

From the above it is clear that the proposed method of modeling mechanical jaundice in the experiment makes it possible to create an adequate model of mechanical jaundice, which allows to conduct clinical and biochemical studies of the homeostasis disorders that have occurred

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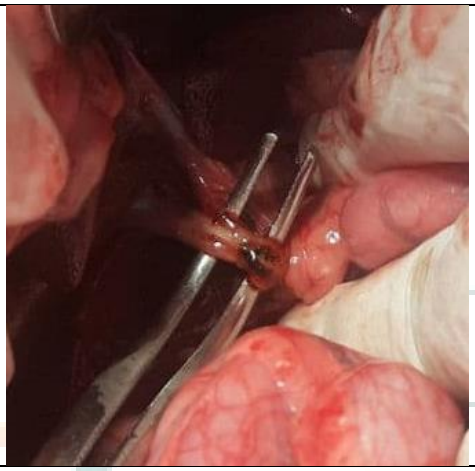
and evaluate the effectiveness of liver function correction (for example, when carrying out various methods of extracorporeal detoxification). Here is an example that confirms the possibility of using the proposed method. Four mongrel dogs of similar age and weight under intravenous ketamine anesthesia underwent laparotomy in the right subcostal region. The common bile duct was isolated and compression of the common bile duct was performed according to our proposed method (Fig. 2).



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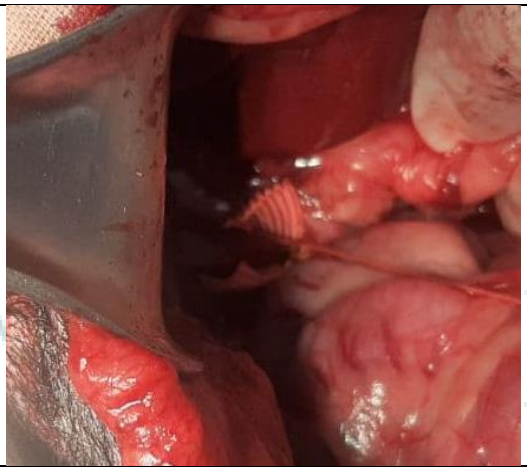
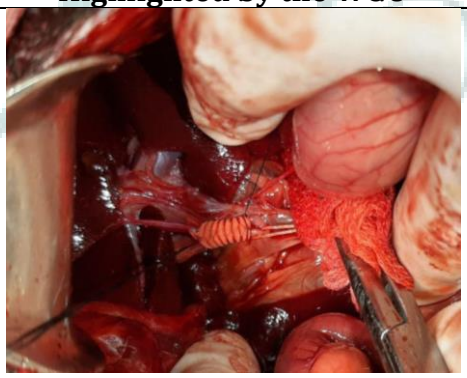
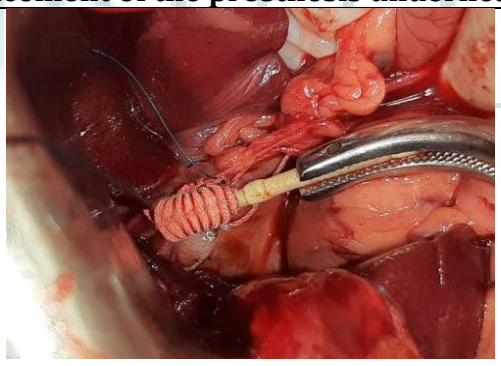


Placement of the prosthesis underneath



Suturing the prosthesis over the VL



Ballooning in the prosthetic lumen of a Fogarty catheter balloon

Figure 2. Stages of performing the simulation method of mechanical jaundice in the experiment

After 24 hours, the clinical picture of mechanical jaundice in animals and laboratory changes were evaluated, and morphological examination was carried out. It was found that all animals showed

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intensive jaundice staining of mucous membranes and skin, in blood biochemical analysis there was a significant increase in total bilirubin due to direct fraction.

On day 5, the Fogarty catheter balloon was loosened and the catheter was removed. Necessary clinical and biochemical investigations were carried out. After removal of the Fogarty catheter, the phenomena of mechanical jaundice regressed (Table 1).

Table 1

MH severity indicators on day 5 and reduction in biochemical indicators after the end of the experiment

Indicator	5 day of the experiment	2 day after the experiment t	5 day after the experiment
Total bilirubin (μmol/l)	216,0±13,2	146,0±10,5	82,5±9,0
Urea (mmol/l)	11,8±,9	10,3±0,6	8,3±0,5
Creatinine (μmol/l)	154,8±15,1	134,5±8,6	99,0±5,8
Ammonia (μmol/L)	61,0±1,5	51,3±2,0	35,0±2,2
Total protein (g/l)	69,0±1,3	62,8±1,0	66,0±1,9

CONCLUSION

The improved way of modeling of the regulated common bile duct obturation to form an experimental model of the mechanical jaundice allows to correct the cholestasis degree, does not result in the extrahepatic biliary tract damage and does not require further repeated operations in animals to restore the bile flow. The offered method is recommended for experimental scientific and practical researches on efficiency estimation of various variants of treatment of a liver insufficiency syndrome.

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REFERENCES

1. Byass P. The global burden of liver disease: a challenge for methods and for public health. BMC Med. 2014 Sep 18;12:159. doi: 10.1186/s12916-014-0159-5.
2. Busch M, Wedemeyer HH. Acute liver failure-The importance of rapid diagnostics and early initiation of treatment. Internist (Berl). 2020;61(11):1151-1162.
3. Vollmar J, Stern F, Lackner K, Mildenberger P, et al. Urinary ethyl glucuronide (uEtG) as a marker for alcohol consumption in liver transplant candidates: a real-world cohort. Z Gastroenterol. 2020;58(1):30-38.
4. Stahl K, Hadem J, Schneider A et al. Therapeutic plasma exchange in acute liver failure. J Clin Apher. 2019; 34:589-597.
5. Larsen FS, Schmidt LE, Bernsmeier C et al. High-volume plasma exchange in patients with acute liver failure: an open randomised controlled trial. J Hepatol. 2016; 64(1):69-78
6. Azimov M. I., Shomurodov K.E. A technique for Cleft Palate Repair. Journal of research in health science. Vol. 1, No. 2, 2018, pp. 56-59.
7. DJuraev, A. M., & Khalimov, R. J. (2020). New methods for surgical treatment of perthes disease in children. International Journal of Psychosocial Rehabilitation, 24(2), 301-307.
8. . Khodjieva D.T., Pulatov S.S., Khaidarova D.K. All about hemorrhagic stroke in elderly and senile persons (own observations) // Science of Young People (Eruditio Juvenium). 2015. №3. C. 87-96.
9. . MI Kamalova, S Khaminov, B Eshboltaeva Morphometric features of bronchial epithelium development in rabbits in postnatal ontogenesis
10. Shomurodov. K.E. Features of cytokine balance in gingival fluid at odontogenicphlegmon of maxillofacial area. // Doctor-aspirant 2010.-42 Vol.-No.5.1.-P.187-192;
11. Ilkhomovna, K. M., Eriyigitovich, I. S., & Kadyrovich, K. N. (2020). Morphological Features Of Microvascular Tissue Of The Brain At Hemorrhagic Stroke. The American Journal of Medical Sciences and Pharmaceutical Research, 2(10), 53-59.

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12. Khodjieva D. T., Khaydarova D. K., Khaydarov N. K. Complex evaluation of clinical and instrumental data for justification of optive treatment activites in patients with resistant forms of epilepsy. American Journal of Research. USA. № 11-12, 2018. C.186-193.
13. Khodjieva D. T., Khaydarova D. K. Clinical and neuroph clinical and neurophysiological ch ogical characteristics of teristics of post-insular cognitive disorders and issues of therapy optimization. Central Asian Journal of Pediatrics. Dec.2019. P 82-86
14. Sadriddin Sayfullaevich Pulatov. (2022). Efficacy of ipidacrine in the recovery period of ischaemic stroke. World Bulletin of Public Health, 7, 28-32.
15. Tukhtarov B.E., Comparative assessment of the biological value of average daily diets in professional athletes of Uzbekistan. Gig. Sanit., 2010, 2, 65–67.