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Easy to say, hard to do[1].

To the anniversary of two fundamental discoveries. Part 2

A.Yu. Anisimov

Kazan (Volga Region) Federal University,

18 Kremlevskaya St., Kazan 420008 Russia

Corresponding author: Andrey Yu. Anisimov, Prof., Dr. Sci. (Med.), Head of the Department of Emergency Medical Care and Simulation Medicine, Institute of Fundamental Medicine and Biology of Kazan (Volga Region) Federal University, aanisimovbsmp@yandex.ru

Abstract

On the eve of the anniversaries of two historical events: the 145th anniversary of the experiments in which Eck's fistula was performed and the 55th anniversary of the successful clinical approbation of the selective distal splenorenal anastomosis, a retrospective analysis of the key historical stages in the development of portal hypertension surgery was performed: from the first attempts to describe the anatomy of the hepatic vascular system, explaining its purpose in the body, the development of direct portacaval anastomosis, and the widespread use of selective splenorenal anastomoses, to the Transjugular Intrahepatic Portosystemic Shunt procedure and orthotopic liver transplantation. Meantime, the emphasis has been focused on the most colorful characters of researchers and clinicians who passed this path. The expediency of an integrated approach in solving the problems of portal hypertension with the development of both fundamental and applied clinical and organizational

[1] From Latin: Facĭle dictu, difficĭle factu

aspects has been substantiated. It is shown that the discoveries born from summarizing the results achieved by numerous researchers have contributed to a better understanding of this field of medicine, have become a solid foundation for what we have today and are a reliable platform for a successful start into the future.

Keywords: history of medicine, portal hypertension, surgical treatment

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Introduction

“There are moments when, in order to highlight and understand the present, it is useful to turn over a few forgotten pages in the history of medicine, and perhaps not so much forgotten as unknown for many”

N.N. Burdenko

September 2022 was marked by two historical events that had had a huge impact on the development of surgery for portal hypertension, a hemodynamic anomaly in the form of a chronic elevation in pressure in the vessels of the portal venous system, leading to potentially life-threatening complications. The mere mention of portal bleeding evokes absolutely opposite emotions in doctors who have ever faced it on their professional path: from a heady premonition of the opportunity to effectively apply their knowledge and clinical experience to a sticky fear of fatal hopelessness and hopelessness in their attempts to save the patient's life. Until finally 145 years ago, at the St. Petersburg Imperial Medical and Surgical Academy, a young Russian doctor Nikolai

Vladimirovich Eck, for the first time in an experiment after transecting the portal vein, did not connect its distal end to the inferior vena cava. Eck 's fistula, which today we would call a total portacaval shunt, by means of which "blood from the portal vein could be directed directly into the general circulation without any danger to the body" immortalized the name of the author, enabling surgeon-hepatologists to walk confidently along the tortuous historical way of portal hypertension surgery. Fifty-five years ago, ninety years after N.V. Eck, W. Dean Warren, Robert Zeppa and John J. Fomon at the University of Miami School of Medicine and Jackson Memorial Hospital (Miami, Florida, USA) proposed a then-new selective splenic shunting operation in situ, marking the beginning of an era of effective surgical treatment of patients with portal hypertension using a selective distal splenorenal shunt, which allowed not only to save the spleen and left kidney, but also provided a decrease in pressure and flow volume through the gastroesophageal veins, as well as maintained portal venous perfusion of the liver and constant venous hypertension in the intestinal tract with postoperative prevention of post-shunt encephalopathy and acute liver failure.

In anticipation of the approaching anniversaries of these two historical events, we took the liberty of reminding ourselves of the long and thorny path of portal hypertension surgery. The dramatic history of portal hypertension surgery from the first attempts to describe the anatomy of the liver vascular system, explain its purpose in the body, the development of a direct portacaval fistula, the widespread use of selective splenorenal anastomoses prior to the TIPS procedure, and orthotopic liver transplantation is full of bright events, unforgettable impressions and deep respect for those researchers and clinicians who have worked in this field.

In the second part of the historical review, we will talk about the most striking technological trends in portal hypertension surgery in the 20th century and the theories of the pathogenetic substantiation of surgical interventions in terms of preventing recurrent bleeding and increasing the life expectancy of patients, which have become a solid foundation for what we have today and are a reliable platform for a successful start to the future.

Part II. The Golden Age of Portal Surgery

“Surgery is a divine art, which subject is a beautiful and sacred human image. Surgery must see to it, so that the marvelous proportion of its form, which has been disturbed somewhere, to be restored again."

Ferdinand Gregorovius

Almost half a century has passed since the first M.E. Vidal portosystemic shunting in humans was performed in 1903. More and more researchers have tried to gain insight into the pathological changes that occur in the body in portal hypertension in order to achieve higher quality evidence on which to base a more rational surgical practice.

In 1928, a New Zealand plastic surgeon Archibald Hector McIndoe (1900–1960) (Fig. 1) showed that splenomegaly was the result of portal hypertension [1].

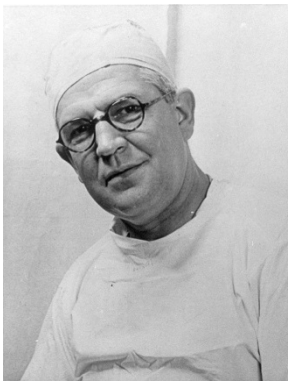

Fig. 1. Archibald Hector McIndoe (1900–1960). Available at: http://www.storiadellamedicina.net/un-pioniere-della-chirurgia-plastica-archibald-mcindoe/

In 1937, a Canadian biologist William Thompson was the first to measure openly the portal vein pressure, conducting studies on both the inferior vena cava and the portal vein [2]. In 1930, K. Westfall used direct pressure with multiple endoscopic balloons to clamp bleeding esophageal varices [3]. This technique has been described again by L.G. Rowtree et al. in 1947 [4]. The inflatable balloon tube was improved by Robert William Sengstaken (1923−1978) (Fig. 2) and Arthur Hendley Blakemore (1897−1970) (Fig. 3). The results of using this tube in a series of 25 patients with bleeding from esophageal varices were presented by them in 1950 [5].

Fig. 2. Robert William Sengstaken (1923–1978). Available at: https://www.shutterstock.com/es/editorial/image-editorial/campanella-car-accident-glen-cove-usa-5930414a

Fig. 3. Arthur Hendley Blakemore (1897–1970). Available at: https://www.findagrave.com/memorial/50710315/arthur-hendley-blakemore

In 1939, F. Crafoord and P. Frenckner, two Swedish cardiothoracic surgeons, took a different approach. They reported good early results with endoscopic injection of quinine solution around esophageal varices [6]. Unfortunately, the rebleeding rate was high and this method had to be abandoned at that time. Many years later, in 1979, this method was reintroduced by J. Terblanche et al. [7].

Thus, by 1945, when A.H. Blakemore and J.W. Lord demonstrated benefits in the prevention of new episodes of bleeding, the need had long been overdue for surgery combining splenectomy and left-sided nephrectomy followed by end-to-end anastomosis between the splenic

and renal veins (Fig. 4, 5) with an aggressive approach to the treatment of portal hypertension [8].

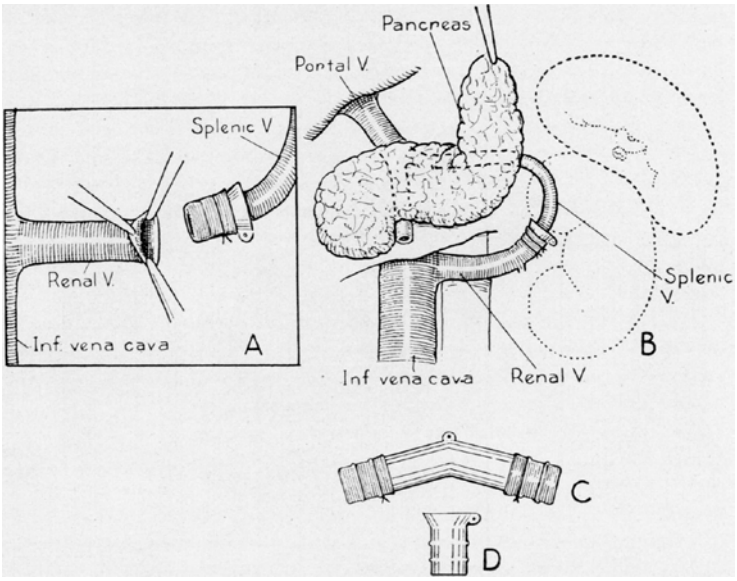

Fig. 4. The technique of using vitallium tubes in portacaval shunting. Illustration from the article by Blakemore A.H., Lord J.W. (1945)

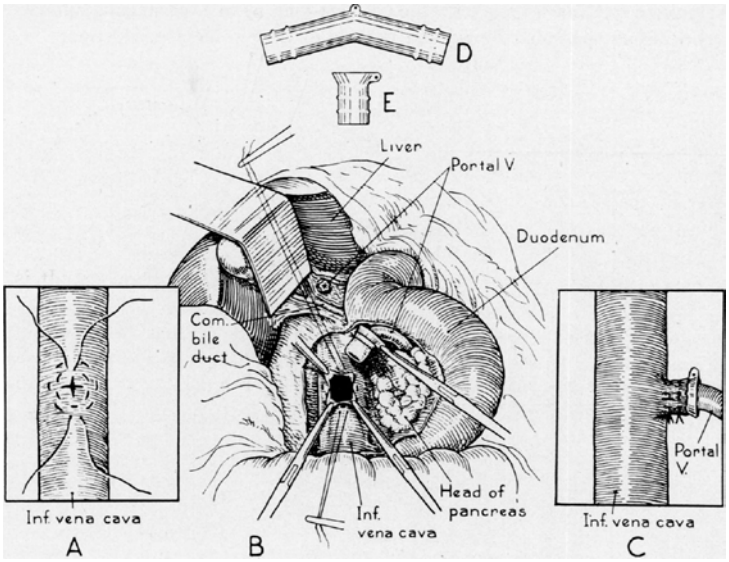

Fig. 5. The technique of using vitallium tubes in portacaval shunting. Illustration from the article by Blakemore A.H., Lord J.W. (1945)

Until 1945, only 45 cases of portosystemic shunts were reported in the literature, and just 10 years later, in 1955, G. Child had the

opportunity to analyze the results of already 500 operations performed around the world [9].

Inspired by the work of A. H. Blakemore and J. W. Lord who used vitallium tubes to create portacaval shunts for use in portal hypertension, Allen Oldfizer Whipple (1881–1963) (Fig. 6) reported ten portacaval shunting operations at the Columbia Presbyterian Medical Center's Department of Surgery in New York (USA) in 1945. According to A.O. Whipple, all of these operations were purely experimental and bold attempts to solve the problem of portal hypertension in its life-threatening forms. They were performed on patients who had repeated heavy bleeding and in whom conservative measures did not give any hope.

Fig. 6. Allen Oldfizer Whipple (1881–1963). Available at: https://www.flickr.com/photos/21543629@N03/2089558962

In five cases, after the removal of the spleen and left kidney, the splenic vein was connected "end-to-end" to the left renal vein, in another five cases, the portal vein was connected "end-to-side" to the inferior vena cava. All patients survived, with five patients achieving a marked improvement in liver function tests and the disappearance of ascites or bleeding [10]. The direct portacaval anastomosis technique was improved

by A.O. Whipple in collaboration with Alfred Blalock (1899−1964) (Fig. 7) who performed several successful portacaval shunting operations using a mattress suture at the Johns Hopkins Hospital in Baltimore (USA). As a result, the portacaval shunt was implemented in clinical practice because it reduced pressure in esophageal varices with almost no risk of future bleeding.

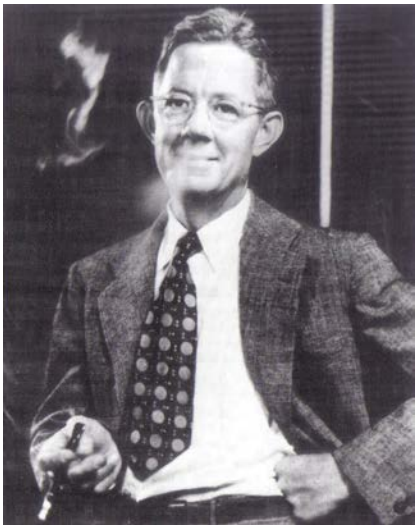

Fig. 7. Alfred Blalock (1899–1964). Available at: https://karsh.org/photographs/dr-alfred-blalock

This, in turn, brought an avalanche of publications describing shunts in numerous conceivable anatomical variations. The best of them were analyzed in detail by Robert Malthus in 1976 [11, 12].

In 1953, in the USSR, Maria Demyanovna Patsiora (1912–1984) (Fig. 8) proposed splenorenal side-to-side anastomosis with salvage of the spleen and kidney. M.D. Patsiora was the founder of a detailed, full-fledged and original teaching on the Russian surgery of portal hypertension; from 1965 to 1981 she headed the first in the USSR specialized department for the surgical treatment of portal hypertension, which she had established with the support of Academician, Professor

B.V. Petrovsky at the Research Institute of Clinical and Experimental Surgery of the RSFSR Ministry of Health (subsequently, All-Union Scientific Center of Surgery). The splenorenal shunt proposed by M.D. Patsiora ensured reducing the risk of liver failure and hepatogenic encephalopathy. Postoperative mortality was mean 6.7% [13].

Fig. 8. Maria Demianovna Patsiora (1912–1984). Available at: https://russianwiki.com/wiki/Пациора,_Мария_Демьяновна

The woks of F.G. Uglov (1904–2008) (Fig. 9) [14] and K.N. Tsatsanidi (1924–1994) contributed to an active introduction in the USSR of mesenteric-caval vascular anastomoses between the superior mesenteric vein and inferior vena cava using the peripheral part of the trunk of the superior mesenteric vein in order few large tributaries of mesenteric blood to the liver were retained above the ligation site [15].

Fig. 9. Fedor Grigorievich Uglov (1904–2008). Available at: https://zen.yandex.ru/media/ofit/vse-sekrety-dolgoletiia-znamenitogo-hirurga-uglova-dojivshego-do-103-let-6048dd813949137c7428f355

In randomized trials, the results of "total" portosystemic shunting were compared with the results of non-operative treatment in patients at the height of variceal bleeding [16], as well as the results of the "prophylactic" shunts, which were performed preventively in patients with varices without bleeding [17].

In 1954, W. V. McDermott described a patient with episodic stupor after portacaval shunting in relation to ammonia metabolism [18]. Patients who underwent portacaval shunting were then closely monitored. "Episodic stupor" was termed "post-shunt encephalopathy" and affected almost 40% of patients [19, 20]. Prospective randomized trials showed no difference in survival between patients with a history of bleeding from esophageal varices who underwent portacaval shunt surgery and those who received pharmacological therapy. The unfavorable conclusion that followed from these works was that over the next twenty years, the operation had only changed the way of dying, because patients who underwent this operation died from liver failure, while those who did not

undergo it died from esophageal-gastric bleeding. Moreover, the quality of life after this operation was significantly affected by manifestations of hepatic encephalopathy.

And only in 1967, ninety years after N.V. Eck, W. Dean Warren (1924–1989) (Fig. 10) et al. put the beginning of an era of effective surgical treatment using a selective distal splenorenal shunt with ligation of the coronary vein of the stomach, which both allowed saving the spleen and left kidney, and also provided a decrease in pressure and volume of flow through the gastroesophageal veins, maintaining portal venous perfusion of the liver and constant venous hypertension in intestinal vascular bed with postoperative prevention of portal hypertension complications (Fig. 11) [21].

Fig. 10. W. Dean Warren (1924–1989). Available at: http://www.surgery.emory.edu/about-us/history.html

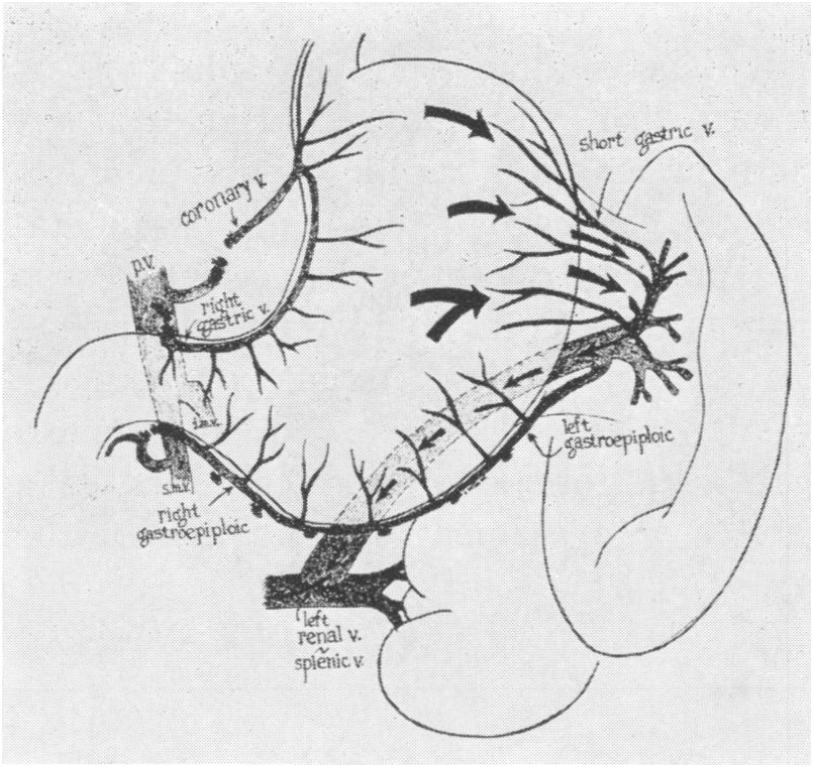

Fig. 11. The scheme of the distal splenorenal anastomosis surgery. Coronary vein, right gastric vein, and right gastroepiploic vein are ligated. Arrows indicate the blood flow direction. Blood from the mesenteric veins continues perfusing the liver through the portal vein. Illustration from the article by Warren W.D., Zeppa R., Fomon J.J. (1967)

In an effort to minimize the operative risk of shunting surgery for portal hypertension in patients with cirrhosis, Charles Gardner Child III (1908–1991) (Fig. 12) and Jeremiah George Turcotte (1933–2020) (Fig. 13), the Chairman, and Lecturer in the Department of Surgery at the University of Michigan at Ann Arbor (USA), respectively, proposed a classification in terms of “liver functional reserve”. It was published in 1964 as part of a monograph chapter on surgery and portal hypertension. The Child- Turcotte classification actually compares the long-term survival rates of patients in the three liver functional reserve groups, predicting outcomes in patients with liver cirrhosis [22].

The original Child–Turcotte classification in 1973 was modified by R.N. Pugh et al. by better defining the encephalopathy severity, adjusting the ranges for serum albumin in each group, and replacing the prolongation of prothrombin time in seconds with nutritional status, i.e. muscle mass [23]. For decades, the Child–Turcotte–Pugh classification нав been used in many studies of patients with cirrhosis, not necessarily limited to those undergoing portal decompression surgery. Repeated attempts to improve the classification either by adding new variables, or by using more sophisticated measures for prediction were not a success. In the twenty-first century, the Model for End-stage Liver Disease (MELD), by a twist of fate designed to predict the survival of patients with the portacaval shunts created, however, in transjugular intrahepatic fashion (TIPS) rather than surgically, replaced the Child–Turcotte–Pugh classification in the field of distribution of liver grafts [24, 25].

Fig. 12. Charles Gardner Child III (1908–1991). Available at: https://liverfellow.org/post/meld-score-part1

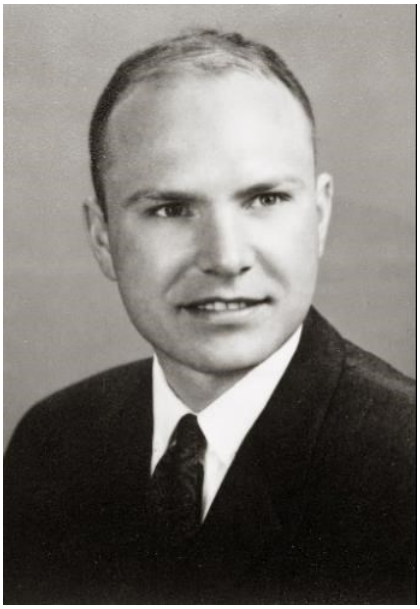

Fig. 13. Jeremiah George Turcotte (1933–2020). Available at: https://obits.mlive.com/us/obituaries/annarbor/name/jeremiah-turcotte-obituary?id=8676921

Within twenty years after the publication of W. Dean Warren, a large amount of work was carried out by surgeons around the world, during which alternative surgical options for decompression of varicose veins were tested with a minimal risk of liver failure.

Kiyoshi Inokuchi (born in 1921) (Fig. 14) in Fukuoka (Japan) combined a shunt between the left gastric vein and inferior vena cava with splenectomy [26].

Fig. 14. Kiyoshi Inokuchi (born in 1921). Available at: https://isde.net/ISDE-news/7871994

In addition to Kiyoshi Inokuchi's efforts, Theodore Drapanas (1930–1975) (Fig. 15) who worked in New Orleans proposed a mesocaval shunt [27].

Fig. 15. Theodore Drapanas (1930–1975). Available at: https://aasldpubs.onlinelibrary.wiley.com/doi/10.1002/cld.877

In the 70–80s in the USSR, thanks to the works of Mikhail Ivanovich Lytkin (1919–2013) (Fig. 16) and Igor Alexandrovich Eryukhin (1936–2014) (Fig. 17), the principles of dosed decompression were formulated with the obligatory use of surgical method of

portosystemic shunting in various modifications in patients Child-Pugh functional Classes A and B [28, 29].

Fig. 16. Mikhail Ivanovich Lytkin (1919–2013). Available at: http://www.fnperm.ru/лауреат-государственной-премии.aspx

Fig. 17. Igor Aleksandrovich Eryukhin (1936–2014). Available at: https://abcd42.ru/prochee/travmatologiya-osnovy-voenno-polevoj-hirurgii.html

Among the numerous disciples of M.D. Patsiora, of course, the first should be remembered Alexander Konstantinovich Yeramishantsev (1938–2009) (Fig. 18), an innovative scientist, a “patriot” of surgical hepatology, one of the most difficult sections of medicine, a leading

expert on one of its most important problems, the- portal hypertension surgery which he had been doing since 1965. In 1990, the first successful orthotopic liver transplantation in the USSR was performed under the leadership of A.K. Yeramishantsev and with his direct participation at the All-Union Scientific Center of Surgery. He postulated that the surgical intervention aimed at preserving the hepatic portal blood flow can be effective only if a number of principles are followed: 1) always put to elective surgery when operate on patients with portal hypertension; 2) operate on only those patients who have retained good liver function, no lower than Child-Turcotte-Pugh Class A; 3) patients should be operated on in large medical centers by surgeons who are interested in the problem and have sufficient experience in this field; 4) apply only selective shunts, such as Warren's distal splenorenal anastomosis or, if their performance is impossible, make a complete azygoportal disconnection [30].

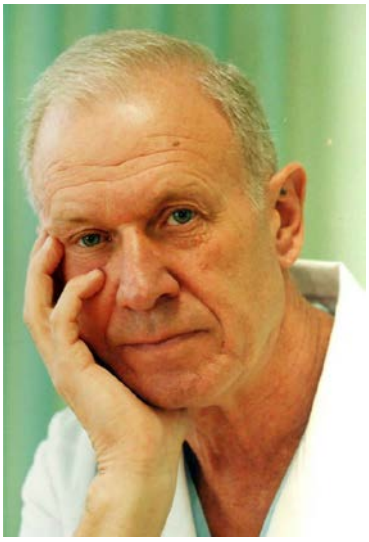

Fig. 18. Alexander Konstantinovich Eramishantsev (1938–2009). Available at: http://hepar.ru/news/?id_news=9

Iraj James Sarfeh (born in 1945) (Fig. 19) and his colleagues first used dacron for a portacaval H-shunting, and polytetrafluoroethylene later on [31].

Fig. 19. Iraj James Sarfeh (born in 1945). Available at: https://www.vitals.com/doctors/Dr_Iraj_Sarfeh.html

They also suggested that it was the 8-mm diameter of a polytetrafluoroethylene vascular prosthesis that ultimately provided the perfect balance between reducing the risk of postoperative variceal bleeding and the progression of postoperative hepatic encephalopathy [32]. Meantime, although the control of bleeding was as good as with total shunting and the severity of encephalopathy slightly reduced, this shunting option still did not provide a clear advantage in patient survival.

In 1994, in the Department of Abdominal Surgery and Portal Hypertension of the Scientific Center for Surgery of the Russian Academy of Medical Sciences, Viktor Mikhailovich Lebezev (born in 1948) (Fig. 20) showed an advantage in terms of the main features of partial portacaval shunting over the suture of esophageal and gastric varices in patients with liver cirrhosis. At the same time, partial shunting had a significant advantage over total shunting in terms of parameters reflecting liver function, quality of life, and survival in these patients. The implementation of microsurgical technique elements and the use of the internal jugular vein segment as an autograft in portacaval shunting made

it possible to perform anastomoses with the portal system vessels of a small diameter (5–9 mm) and thereby increase the proportion of radical operations up to 70% [33].

Fig. 20. Employees of the Department of Abdominal Surgery and Portal Hypertension of the Scientific Center for Surgery of the Russian Academy of Medical Sciences. Bottom row, left to right: V.M. Lebezev, S.B. Zhigalova, A.G. Scherzinger. Top row, left to right: E.A. Kitsenko, G.V. Manukyan, R.A. Musin. Available at: http://hepar.ru/upload/tiny_mce/548828921553302976905.png

In 1998 in St. Petersburg at the S.M. Kirov Military Medical Academy of the Ministry of Defense of the Russian Federation, Professor Petr Nikolaevich Zubarev (1945–2020) (Fig. 21) proposed a spiral autovenous mesenteric-caval shunt. An autograft was formed of the greater saphenous vein, first by dissecting it longitudinally, and then suturing it in a spiral in the form of a tube of the required length and diameter [34].

Fig. 21. Petr Nikolaevich Zubarev (1945–2020). Available at: https://www.vmeda.org/s-02-02/ds-02-50/

Bogdan Nikolaevich Kotiv (born in 1964) (Fig. 22), the follower of P.N. Zubarev, devoted his work in 1998 to finding a balance between the need for portal decompression and the maintenance of portal hepatic perfusion with a differentiated choice, based on the results of the assessment of portal blood flow, between selective distal splenorenal anastomosis and partial anastomoses (splenorenal "side-to-side", mesenteric-caval, H-shaped anastomoses) [35].

Fig. 22. Bogdan Nikolaevich Kotiv (born in 1964). Available at: https://goaravetisyan.ru/voennye-zvaniya-vrachei-professiya-voennyi-vrach-osnovnye-specialnosti/

In 2004, F.G. Nazyrov (born in 1950) (Fig. 23) improved the technique of forming the H-shaped splenorenal anastomosis due to the imposition of a synthetic cuff over the venous insert, limiting the portal shunt. The operation made it possible to achieve positive results in 95% of patients in the immediate postoperative period [36].

Fig. 23. Feruz Gafurovich Nazyrov (born in 1950). Available at: https://m.kun.uz/ru/news/2019/12/07/nam-zapreshchali-dumat-ob-etom-feruz-nazyrov-o-problemax-meditsiny-v-karimovskoy-epoxe-i-novyx-dostijyeniyax

In 2017, at the S.M. Kirov Military Medical Academy of the Ministry of Defense of the Russian Federation, B.N. Kotiv and Ilya Igorevich Dzidzava (born in 1974) (Fig. 24) for the first time in the world developed and tested a method of laparoscopic distal splenorenal anastomosis with ligation of the splenic artery and devascularization of the stomach in portal hypertension [37].

Fig. 24. Ilya Igorevich Dzidzava (born in 1974). Available at: https://www.spb.kp.ru/daily/217180/4285480/

Severe complications of surgical shunting such as postoperative liver failure, encephalopathy, shunt thrombosis, and ultimately, the recurrence of variceal bleeding, as well as the absence of anatomical conditions for the formation of anastomosis and the occurrence of extensive thrombosis of the portal system vessels in 60-80% of patients with the so-called "unshuntable portal hypertension" led to the development of a number of "non-shunting " operations of azigoportal disconnection. In order to stop portal bleeding, J. Boerema in 1949 [38], and G. Crile Jr. in 1950 [39], proposed to dissect the esophagus longitudinally through thoracotomy followed by suturing and ligation of varicose veins by separate (J.Boerema) or continuous (G. Crile Jr.) sutures. In addition, for obliteration of veins, a 66% glucose solution was additionally injected into their lumen. The esophagus was repaired with a three-row suture. Recurrence of bleeding after these operations made 20-45% in the early postoperative period, and 50% or more at a later stage. Mortality ranged from 35% to 75%. In 1950, N.C. Tanner proposed to completely transverse the stomach 5 cm below the cardia followed by its suturing [40]. However, extramural venous collaterals remained intact.

Through them there was an influx of blood into the venous varices above the level of stomach transection. Revascularization was the cause of recurrent variceal bleeding in 35–45% of patients. In 1945–1950, a team of surgeons from Minneapolis (USA) led by O. Wangensteen developed a modification of the esophagus and stomach resection with simultaneous replacement with an intestinal graft to treat the esophageal and gatsric varices. In the 1960s-1970s, great expectations were placed on this operation as the most radical method, when shunt operations turned out to be impossible. However, it turned out to be too traumatic and did not become widespread [41]. In 1957, the German surgeon K. Vosschulte proposed a method of ligature azigoportal disengagement. An internal segmental frame was preliminarily placed into the esophagus. A ligature was tightened around the esophagus on it. Serous-muscular sutures were applied over the ligature. As the ligature gradually cut through all layers of the esophageal wall, a rough scar formed that prevented the development of collateral circulation [42]. In the long-term period, cicatricial stenosis of the esophagus developed rather often.

In 1959, M.D. Patsiora developed a low-traumatic palliative operation to uncouple the azigoportal vascular pool [13]. An oblique transverse gastrotomy was performed in the cardial part of the stomach. Further, varicose veins and large folds located in the cardial section of the stomach and, as possible, the lower third of the esophagus are stitched with separate interrupted sutures in a checkerboard pattern. The early bleeding recurrence rate after Patsiora's operation reached 20%.

In 1967, the Egyptian surgeon M.A. Hassab proposed an effective technique for reliably stopping bleeding in isolated gastric varices. During the surgery, a splenectomy, extensive devascularization of the stomach and distal esophagus were performed [43]. However, due to the

salvage of the intramural veins of the esophagus and stomach, the recurrent bleeding rate reached 25-34%.

In 1960–1965, M.D. Patsiora performed the first partial esophagogastrectomy operations in the USSR. However, patients died from the esophageal-gastric anastomosis suture failure. And only after 1968, when Kim Nikolaevich Tsatsanidi (1924–1994) (Fig. 25) put into practice the original technique of invaginated esophagogastric anastomosis, the immediate results of this operation did improve [44].

Fig. 25. Kim Nikolaevich Tsatsanidi (1924–1994). Available at: http://t.co/O8y2WBOZrQ"/Twitter

In 1973, Japanese surgeons Mitsuo Sugiura (1926–1988) (Fig. 26) and Shunji Futagawa at the Department of Surgery of the Faculty of Medicine of the University of Tokyo (Japan) developed one of the most effective and most traumatic operations of combined two-stage disengagement of the azigoportal vascular pool [45]. In the classic version, it consists of the thoracic and abdominal stages. During the thoracic stage, the esophageal transection is performed, its suturing at the level of the esophageal orifice of the diaphragm and the ligation of all communicating branches from the venous plexi around the esophagus to the level of the lower pulmonary veins. During the abdominal stage, the

splenectomy and devascularization of the abdominal esophagus and cardia, stem vagotomy and pyloroplasty are performed. As a result, the esophagus is devascularized over the extent of 10-12 cm, and the stomach is devascularized over 7 cm, and the portal and caval venous systems are completely separated due to the transection of the esophagus. In severe liver failure, the operation is performed with a time interval between the stages, starting with the thoracic one. In the postoperative period, failure of the esophagoesophageal anastomosis may occur in 6–9%, stenosis of the esophagus in 4–5%, and acute liver and kidney failure in 3–9% [46, 47].

Fig. 26. Mitsuo Sugiura (1926–1988). Available at: https://opc.mfo.de/detail?photo_id=4108

Hector Orozco-Zepeda (1935–2013) (Fig. 27) in Mexico City (Mexico) performed this operation mainly from the transabdominal approach [48]. At the same time, it should be noted that H. Orozco-Zepeda was an advocate of selective shunting in appropriately selected patients [49].

Fig. 27. Hector Orozco-Zepeda (1935–2013). Available at: http://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S0034-83762007000100010

In 2004, in the Department of Emergency Surgery and Portal Hypertension of the Russian Scientific Center for Surgery of the Russian Academy of Medical Sciences, Evgeny Alexandrovich Kitsenko (born in 1952) (Fig. 20), based on a large clinical material, made a comprehensive assessment of the operation of suturing varicose veins of the esophagus and stomach in patients with extrahepatic portal hypertension as a result of malformations of the portal system vessels, hematological diseases and previous injuries or inflammatory diseases in the abdominal cavity. At the same time, he showed that gastrotomy with suturing the varicose veins of the esophagus and stomach was an effective operation to control and prevent gastroesophageal bleeding in patients with extrahepatic portal hypertension when it is impossible to impose a vascular portacaval anastomosis. Repeated suturing of esophageal and gastric varices in patients with non-shuntable portal hypertension provides a long-term remission of esophageal-gastric variceal bleeding and is the operation of choice both to control and prevent bleeding from the veins of the esophagus and stomach [50].

F.G. Nazyrov and Andrey Vasilyevich Devyatov (born in 1959) (Fig. 28) developed and successfully tested an original option of stomach devascularization along the greater and lesser curvature with its ligature crossing at the level of the upper third on a synthetic frame installed in the organ lumen. It supplements the extraorganic separation of the veins of the esophagus and the stomach cardiac part from the portal system by the formation of an intramural rough scar that borders the wall of the stomach at the level of the ligature transection. The method became known as F.G. Nazyrov's operation, or the operation of total separation of the gastroesophageal collector according to F.G. Nazyrov. Recurrent bleeding after this operation was noted in 6% of patients. Postoperative mortality was 15.6% [51].

Fig. 28. Andrey Vasilyevich Devyatov (born in 1959). Available at: https://www.devyatov.uz/en/resume

Be that as it may, but in the final length, in the treatment of bleeding from esophageal varices, the surgical shunting occupied a niche of the second plan, as the lead has now moved to endoscopic and pharmacological measures with TIPS performed for ongoing bleeding. Marshall J. Orloff (1927–2018) (Fig. 29) was the only surgical voice who

disagreed with this view and came forward in support of portosystemic shunts in this era. At the University of California San Diego Medical Center (USA), his group presented the results of two randomized clinical trials conducted from 1988 to 2011 in unselected patients who received emergency treatment for bleeding from esophageal varices. In the first study, 211 patients were randomized to receive emergency endoscopic sclerotherapy (n=106) or emergency portacaval shunting (n=105). In the second study, 154 patients were randomized to either TIPS (n=78) or emergency portacaval shunting (n=76). According to Marshall J. Orloff, an emergency portacaval shunt permanently stopped bleeding from varicose veins, was almost never thrombosed, provided a 5-fold long-term survival rate, and was much cheaper than emergency endoscopic sclerotherapy or TIPS [52]. His shunts even vied for success with liver transplantation [53].

Fig. 29. Marshall J. Orloff (1927–2018). Available at: https://www.susweb.org/2018/11/19/in-memoriam-marshall-j-orloff-md/

Conclusion

One of the most favorable features of the selective variceal decompression concept, scientifically grounded in 1945 by the studies of A.H. Blakemore, J.W. Lord, and Allen Oldfizer Whipple and brilliantly confirmed in practice in 1967 by W. Dean Warren et al., is that the encouraging results of distal splenorenal anastomosis were reproducible in most surgical centers where it was used. Decompression of the critical area of esophageal and gastric varices by diverting the splenic venous flow through the spleen and left renal vein, while maintaining high pressure in the intestinal veins, when the superior mesenteric and portal venous flows are maintained in the axis of the superior mesenteric and portal veins and continue to perfuse the stomach and liver ensured a long-term survival in thoroughly selected patients with portal hypertension with high portal venous flow and relatively intact liver function. On the other hand, this option of portacaval shunting was not without a number of disadvantages that stood in the way of its wide clinical use. This stimulated the researchers to look for other alternative way to solve the problem of portal hypertension. Some of those ways, as mentioned above, have already become things of the past, without confirming their effectiveness in wide clinical practice. Other, the most promising areas will be discussed in the third part of our historical review.

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Information about the author

Andrey Yu. Anisimov, Prof., Dr. Sci. (Med.), Head of the Department of Emergency Medical Care and Simulation Medicine, Institute of Fundamental Medicine and Biology of Kazan (Volga Region) Federal University, https://orcid.org/0000-0003-4156-434X, aanisimovbsmp@yandex.ru

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