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SURGICAL TREATMENT OF VISCERAL AND RENAL ABDOMINAL ARTERY ANEURYSMS OF VARIOUS ETIOLOGY

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Abstract

Visceral artery aneurysms are detected when complications occur or accidentally during examination for other diseases gastrointestinal tract, aimed at determining the functional significance.

Over the past 10 years, we have observed 31 patients with abdominal visceral artery aneurysms, 10 patients had renal aneurysms, 15 had splenic arteries, hepatic artery and pancreatoduodenal artery aneurysms – in one case. The combination of aneurysms – in 2 cases: in one case – the renal artery with the splenic artery, in the other – the renal artery and the abdominal trunk. The patients ranged in age from 24 to 78 years, the average age is 43±6.5.

Previously, infection was considered the most common cause of splenic artery aneurysms in 10 cases, with most patients complaining of fever, abdominal pain and a pulsating mass in the abdomen. And two patients with splenic artery aneurysm noted abdominal trauma. 3 had atherosclerotic changes. The causes of renal artery aneurysms are atherosclerosis in 6 cases, fibromuscular dysplasia in 2 cases, and Nonspecific aortoarteritis in 2 cases. Also, atherosclerotic etiology is present in aneurysms of the external iliac arteries aneurysms.

Reconstructions on hepatobiliary aneurysms were performed in 6 (20%) cases, in 5 cases - resection with end-to-end anastomosis and in 2 cases - resection of splenic artery aneurysm, resection of splenic artery aneurysms with autovenous patch, clipping of splenic artery aneurysms – in 2 cases (6.5%), endovascular techniques were applied in 18 cases (58%).

In 2 cases, nephroectomy was performed due to the spread of the aneurysm into the kidney gate and the lack of conditions for reconstruction.

In the immediate and long-term (after 6 months and 3 years) postoperative period, the preservation of organ function in reconstructive and ligating methods of surgical treatment is the same.

Signs of ischemia and impairment in the immediate postoperative period were not observed with reconstructive and ligating methods of surgical treatment.

The choice of treatment method depends on the severity of the patient's condition, clinical manifestations, as well as the localization of the aneurysm and its morphology. Preference is given to endovascular techniques, which are not traumatic enough and provide a good long-term result. However, in each case, the patient's management tactics are individual, the choice of the optimal method of treatment of visceral artery aneurysms is based on data from the entire spectrum of possible diagnostic manipulations.

Keywords: *visceral, renal abdominal artery, aneurysms, endovascular embolization, surgical treatment*

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Introduction

Visceral artery aneurysms of the abdominal cavity are among the rare diseases and are often a diagnostic finding during examination or are diagnosed when complications occur (ruptures, thrombosis of the distal parts). According to pathological studies, ABA are detected in 0,01-0,2% [*Komarov RN et al. 2017, Menglibayev MM et al., 2017*].

The causes of visceral artery aneurysms are atherosclerosis, fibromuscular dysplasia, mycotic etiology of disorders in the synthesis of collagen structure, trauma, etc.

Most patients with mycotic aneurysms are younger than 50 years old, and patients with atherosclerotic aneurysms are usually in their seventh or eighth decade. [*Kopatsis AD' et al., 1998*]

True aneurysms consist of an abnormal expansion of the arterial wall more than 1.5 times its normal diameter, including all three vascular layers [*Pasha S et al., 2007; Chiaradia M et al., 2015*].

Pseudoaneurysms are characterized by rupture of the mediastinum and intimate layers of the arterial wall.

Renal artery aneurysms are a local expansion of the vessel diameter by two or more times, compared with its unchanged or normal diameter. This disease is very rare. Renal artery aneurysms account for only 0.8 - 1% of aneurysms of all other localizations [*Belov YuV et al., 2003*]. However, at present, due to the improvement of diagnostic methods, especially screening, as well as the introduction into clinical practice of kidney angiography has led to more frequent diagnosis of this disease [*Pliskin MJ et al., 1990*].

Table 1

Distribution of patients depending on localization and etiology

Localization	Aneurysms		Atherosclerosis	aortoarteritis	Posttraumatic	Foot and-mounth disease	Inflammation
	n	%					
External iliac artery	2	6.5	2	0	0	0	0
Splenic artery	15	49	3	0	2	0	10
Renal artery	10	32.5	6	2	0	2	0
Hepatic artery	1	3	1	0	0	0	0
Pancreatoduodenal artery	1	3	0	0	0	0	1
Aneurysm of the renal arteries and the abdominal trunk	1	3	1	0	0	0	0
Aneurysm of the renal and splenic arteries	1	3	1	0	0	0	0
Total	31	100	14	2	2	2	11

The main etiological causes of aneurysm renal arteries are congenital degeneration of the media, atherosclerosis, nonspecific aortoarteritis, fibromuscular dysplasia, nodular periarteritis and trauma [*Belov YuV, 2003*].

The largest percentage of renal artery aneurysms is localized in the area of bifurcation of the main trunk or its branches (about 50%), since it is in this place that degeneration of the elastic structures of the artery wall and its media is noted as a result of congenital or acquired diseases [*Ekestrom S, 1964*].

Clinically, visceral artery aneurysms can manifest when they rupture and are accompanied by symptoms of "acute abdomen", hypotension. Ultrasound duplex scanning plays a certain role in diagnostics. The exact diagnosis of VISCERAL ARTERY ANEURYSMS is established during multispiral computed tomography, angiography of the visceral branches of the abdominal aorta. Endovascular, surgical methods are used in the treatment of visceral artery aneurysms. Thus, with aneurysm of the splenic artery, resection of the aneurysm is recommended, with its large size and location in the spleen gate – splenectomy [*Khamitov FF, Dibirov MD, 2013*], if possible, resection is completed by restoration of the splenic artery. In case of hepatic artery aneurysm, ligation of the hepatic artery is recommended without reconstruction with a proximal extrahepatic location of the aneurysm, sometimes there is a need for shunting the distal segment of the hepatic artery operations. Endovascular interventions – stenting, aneurysm embolization are not traumatic, but they must be performed according to strict indications. [*Wojtaszek M et al., 2013*].

Objective: to improve the diagnosis and results of surgical treatment of patients with visceral and renal artery aneurysms.

To overcome it is possible, due to the uniting the knowledge and will of all doctors in the world

Materials and methods

Over the past 10 years, 31 patients with abdominal aortic visceral artery aneurysms have been under our supervision (Table 1). Kidney aneurysms were found in 10 patients, splenic arteries in 15, hepatic artery and pancreatoduodenal artery aneurysms – in one case. Combination of aneurysms – in 2 cases: in one case – renal artery with splenic artery, in the other – renal artery and abdominal trunk. The age of the patients ranged from 24 to 78 years. the average age is 43±6.5 years.

Symptoms of splenic artery aneurysm were associated with gastrointestinal discomfort, such as chronic abdominal pain; bleeding and hematomas were detected in two cases at the initial diagnosis, while the diagnosis was accidental in 4 patients (13%).

And with aneurysm of the renal arteries, discomfort, pulling pains in the lumbar region on the right and arterial hypertension were revealed. Patients with these symptoms were examined for unclear abdominal pain, and the diagnosis was confirmed after angiography of the visceral branches of the abdominal aorta.

The following methods were used in the examination of patients: ultrasound Doppler examination, diagnostic laparoscopy, multispiral computed tomography, angiography of the visceral branches of the abdominal aorta.

By localization, the occurrence of peripheral artery aneurysms (Table 1) was more often observed in the splenic arteries - 15 (49%) and renal arteries - 10 (32.5%).

By localization, the occurrence of peripheral artery aneurysms (Table 1) was more often observed in the splenic arteries - 15 (49%) and renal arteries - 10 (32.5%).

If peripheral artery aneurysms are detected, surgical treatment is an indication. Patients with identified peripheral artery aneurysms were operated on.

The size of aneurysms of the branches of the aortic arch and arteries of the upper extremities ranged from 2.5 cm to 5 cm. The average size is 5.3±1.8cm.

According to etiological factors: previously, infection was considered the most common cause of splenic artery aneurysms (in 10 cases (Table 1), while most patients complained of fever, abdominal pain and a pulsating mass in the abdomen. And two patients with splenic artery aneurysms noted abdominal trauma. In three cases - atherosclerotic changes. The cause of renal artery aneurysms is atherosclerosis in 6 cases, fibromuscular dysplasia – in 2 cases, and nonspecific aortoarteritis - in 2 cases. Also, atherosclerotic etiology is present in aneurysms of the external iliac arteries (aneurysms).

The choice of surgical treatment method (Table 2) often depends on many factors: aneurysm morphology, anatomical location and its localization, somatic condition of the patient. Traditional surgical treatment including resection with an autovenous patch, resection with end-to-end anastomosis, and splenic artery clipping are the most commonly used methods. Also with the advent of minimally invasive endovascular techniques, such methods of treatment as embolization of aneurysm cavity with subsequent thrombosis, stent-graft implantation have been used, allowing to avoid open surgical interventions. However, there are a number of factors that do not allow the use of these techniques: tortuous course of the artery, distal location of aneurysm, lack of area for stent implantation. [*Stepanenko AB et al., 2010*] All these factors often force to refuse minimally invasive techniques and apply classical variant of surgical treatment.

Results and discussion

Three patients were operated urgently for ruptured aneurysms accompanied by bleeding. The diagnosis of intraorgan (intrahepatic) and intraabdominal bleeding was suspected on the basis of clinical picture of “acute abdomen”, ultrasound investigation of the abdominal cavity organs and clarified by diagnostic laparoscopy. Subsequently, the indications for laparotomy were made in these

Table 2

Distribution of patients depending on the types of operations

Type of operation	quantities	
	n	%
Resection of an artery aneurysm. (Resection of splenic artery aneurysm with autovenous patch.)	2	6.5
resection with end-to-end anastomosis	5	16
Clipping of the splenic artery aneurysm	2	6.5
Nephrectomy	2	6.5
Implantation of a stent graft into the common and external iliac arteries on the left	2	6.5
X-ray endovascular embolization	18	58
Total	31	100

patients. In one case selective angiography of abdominal aortic arteries and embolization of hepatic artery aneurysm was performed after hemostasis and stabilization. In the second patient after laparotomy we detected bleeding from splenic artery aneurysm rupture in the distal segment; the artery was ligated proximal and distal to the aneurysm. Since there were no signs of splenic ischemia after splenic artery ligation, splenectomy was not performed. At the dynamic follow-up of the patient after 6, 12 months ultrasound, CT, laboratory tests confirmed the preservation of the spleen function, except for its size decrease by 25%.

In case of aneurysms of the renal arteries nephrectomy was performed in 2 cases due to the large size of aneurysms located in the renal collar. In the remaining cases aneurysm resection with end-to-end renal artery an astomosis was performed in 5 cases. X-ray endovascular embolization was performed in 6 cases. The kidney functions were preserved at the follow-up for 3-5 years.

Clinical observation 1

Patient A.R., 44 years old complains of moderate pain in the lumbar region on the right, weakness, malaise. Diagnosis: Splenic artery aneurysm (Figure 1 and 2).

Operation: Upper middle laparotomy. Resection of splenic artery aneurysm. 2009. during a medical examination, the patient was found to have a pancreatic cyst.

A CT scan of the abdominal cavity revealed a picture of aneurysmal extensions of the right common hepatic and splenic arteries, examined by an angiosurgeon and sent to the angiosurgery department for further examination and further decision of treatment tactics.

Figure 1. *Patient with Splenic artery aneurysm.* Multi slice computer tomography

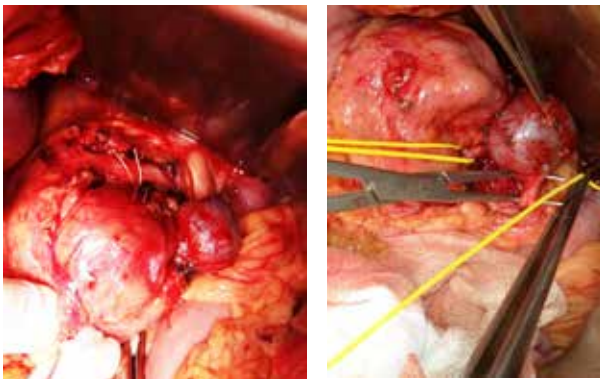

Figure 2. *Patient with Splenic artery aneurysm.* Intraoperative photograph

General condition upon admission of moderate severity, due to the underlying disease. Blood pressure – 100/70 mmHg, pulse – 82 v min. The stomach is not swollen, it participates in the act of breathing

Patient A.R. 44 years old, Intraoperative multi slice computer tomography (MSCT) of the abdominal aorta with contrast (Fig.1). The CT picture is characteristic of saccular aneurysms of the splenic artery. An anomaly of the development of renal arteries is a doubling of the renal arteries on both sides. A simple cyst of the right kidney, category I (according to Bosniak). in the projection of the mouth of the splenic artery with dimensions of 5x5 cm and aneurysms in the middle third of the splenic artery with dimensions of 3x2 cm.

Patient A.R. 44 years old, Intraoperative photograph (Fig. 2). Two splenic artery aneurysms were visualized, measuring 1-5.0x3.0 cm. 2-2.5x2.5 cm. the first aneurysm is located behind the body of the pancreas, in places intimately soldered with surrounding tissues, and is practically intramurally located in the pancreas.

Operation protocol: Operation: upper midline laparotomy. Resection of the splenic artery aneurysm. Autovenous patch. Drainage of the abdominal cavity.

Surgical protocol - Narcosis: endotracheal. An upper midline laparotomy was performed. The abdominal cavity was opened. The stomach was moved downward. The lig. Hepatogastricum was dissected through the small curvature of the stomach, the retroperitoneal space was accessed. Two aneurysms of the splenic artery were visualized, measuring 1-5.0x3.0 cm. 2-2.5x2.5 cm. The first aneurysm was located behind the body of the pancreas, intimately

fused to the surrounding tissues in places, and was almost intramural to the pancreas. The anatomy is disturbed. The rheumatic trunk is prominent. Initial and distal sections of the splenic artery. In the arterial constriction. The filling of the aneurysmal sac stops. The splenic artery is crossed from the mouth, the distal end is ligated. The formed defect could not be sutured due to possible stenosis. Therefore, autovenous plasty was performed. Then the splenic artery was isolated. Inspection of the spleen showed no change of parenchyma staining.

Taking into account intramural aneurysm location in the pancreatic tissue, it was decided not to dissect the aneurysmatic sac. Further, the second aneurysmatic sac, which was located at the spleen gate, was isolated; the aneurysm was resected and the splenic artery was ligated.

On revision, there were no adhesions in the abdominal cavity, the liver and spleen were without features. The parietal peritoneum was dissected by the typical access, at the root of the small intestine, the retroperitoneal space was accessed. The abdominal aorta in the area of the inferior mesenteric artery was isolated in an acute and blunt manner. Then the aorta was isolated proximally along the right lateral contour to the right renal artery. The right renal artery and vein were taken on holders. Further, the right lateral canal was used to access the retroperitoneal space. The ascending colon was folded medially, the right kidney was exposed. The retroperitoneal space was drained. Control hemostasis - dry layer-by-layer suturing of the wound. Aseptic dressing.

CLINICAL OBSERVATION 2.

Patient K. N.I. 70 years old. Diagnosis: Atherosclerosis. Aneurysm of the splenic artery. Operation: laparoscopic clipping of splenic artery aneurysm. (Fig3)

Complaints on admission: Complaints on admission of discomfort, heaviness, moderate pain in the left side of the abdomen and epigastrium, periodic BP fluctuations. is on D registration with the diagnosis: Bronchial asthma, periodically takes rednisolone and eufillin.

Her complaints have been bothering her for several months. She was seen by a gastroenterologist, during the examination with contrast-enhanced CT scan the following was revealed: Aneurysm of c/3 spleen artery with the size of 3x3 cm rysm. (Fig3a, b).

(Description of surgery): Under intubation anesthesia (see anesthesia record), after treating the operative field with povidone solution after CO2 pneumoperitoneum, trocars were inserted in typical locations. Next, the lig. hepatogastricum was dissected along the small curvature of the stomach; the revision revealed an aneurysm of the c/3 splenic artery, 5.0 x 5.0 cm in size; the splenic artery distal and proximal to the aneurysm was isolated; plastic hem-o-lok clips were placed distal and proximal to the aneurysm. Sanation of the omental sac. Hemostasis. Suture to the skin. Aseptic dressing rysm. (Fig3c).

DIAGNOSIS AND TREATMENT OF RENAL ARTERY ANEURYSMS

Renal artery aneurysms are rare vascular blemishes, which partly explains the lack of clearly formulated indications for their surgical treatment so far.

Data analysis has revealed that Renal artery an-

FIGURE 3. *(A, B) Patient with atherosclerosis and Aneurysm of the splenic artery. Multi slice computer tomography and (C) Laparoscopic clipping of splenic artery aneurysm.* Aneurysm of c/3 splenic artery measuring 3x3 cm.

eurysms account for approximately 0.01% in the general population. With the widespread use of angiography and computer-assisted angiography, according to different data, Renal artery aneurysms occur in specific angiography in 0.3-1%, and in patients with Renovascular hypertension up to 3% of cases. The most frequent causes of Renal artery aneurysms development are fibromuscular dysplasia and atherosclerosis.

The clinical picture of Renal artery aneurysms is diverse. At the same time, in the majority of cases, from 42 to 100%, on the average - 74%, their leading manifestations are the syndrome of secondary arterial hypertension and systole-diastolic murmur localized in the lateral parts of the abdomen.

Relatively rare complications of renal artery aneurysms are peripheral arterial renal thromboembolism, thrombosis- occlusion of an artery, its branches with the development of local or total renal infarction.

Renal artery aneurysms with calcification of the walls are of particular interest in terms of indications for treatment. It is believed that their rupture is rare and impossible due to the hardness of the walls. However, the facts of rupture of calcified APAs are reported in the literature. Therefore, although they are rare, [*Henke PK et al., 2001*] consider that active surgical tactics are indicated for asymptomatic APAs 2 cm and larger. It is most likely that rupture of Renal artery aneurysms is caused by incomplete calcification of the aneurysm walls. Thus, to date, the indications for surgical treatment of Renal artery aneurysms remain very controversial with regard to asymptomatic Renal artery aneurysms and require much clarification.

The spectrum of open surgical procedures for Renal artery aneurysms is quite diverse: Resection of the aneurysm with prosthetic, reanastomosis, or its lateral renal artery plasty; aneurysm shutdown with bypass of the renal artery or its branches; resection of the aneurysm with anastomosis of the artery with unpaired visceral arteries; complex reconstructions using autovenous or segment of the internal iliac artery; including the use of renal resection for local infarction or nephrectomy in cases of pronounced nephrosclerosis. Lethality after elective interventions is usually 0%. Even a laparoscopic variant of Renal artery aneurysms elimination is described.

There were 10 cases for 10 years in theSyzganov National Scientific Center for Surgery. The mean values of arterial hypertension in patients with renal artery lesions were: systolic - 155±15,0 mm Hg, and diastolic - 86±8,5 mm Hg.The duration of disease was from 1 to 15 years (mean, 4±3,2).The aneurysm size was 2,5±0,5. The causes of renal artery aneurysms were atherosclerosis in 6 cases, fibromuscular dysplasia in 2 cases, and aortoarteritis in 2 cases.

In the choice of surgical treatment method, nephrectomy was preferred in 2 cases, resection of the aneurysm with end-to-end renal artery anastomosis was performed in 5 cases. Endovascular embolization was performed in 6 cases (Table 2).

The choice of surgical treatment method should depend on the clinical course, etiology, anatomical features and aneurysm size. In the case of sac-shaped aneurysm most authors currently recommend endovascular treatment, in particular embolization of the aneurysm. Endoprosthesis of the renal artery in the presence of an aneurysm is recommended when the diameter of the artery is not less than 6 mm [*Zhang Z, Yang M et al., 2013*]. Also laparoscopic reconstructions of the renal artery with both classic laparoscopic technique and robot-assisted interventions have recently gained popularity [*Duran M et al., 2017*]. Open surgical intervention in sac-shaped aneurysms of the trunk and large branches of the renal artery consists in aneurysm resection with suturing of the arterial defect (“neck” of the aneurysm), in some cases it is possible to plastique the artery with a patch [*Laser A et al. 2015; Arakelyan VS et al., 2017*,]. In case of spindle aneurysms, as a rule, arterial prosthesis is performed. In the case of a combination of aneurysms of the renal artery trunk or branches with renal parenchyma damage, it is recommended to perform partial kidney resection or nephrectomy. A number of authors recommend performing surgical intervention under conditions of heparinization in a dosage of not less than 150 units/kg, single injection of Ringer’s solution (cooled to 4 °C) with the addition of mannitol [*Schulte W et al., 2015*].

***FIGURE** 4 Representation of abdominal aortography, selective angiography of the (A) -right renal artery. (B) -Giant false aneurysm of the right renal artery 44x55mm*

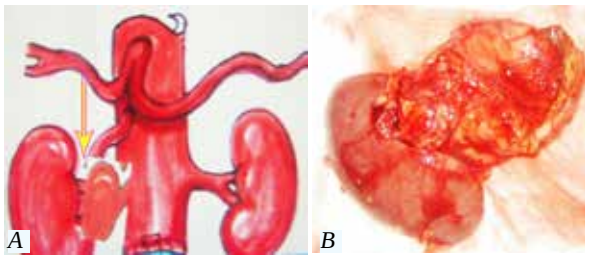

***FIGURE** 5 Schematic representation (A)- right renal artery aneurysm, (B) resection of right renal artery aneurysm with right nephroureterectomy. Microslide of the kidney with the aneurysm*

CLINICAL OBSERVATION 3

In our case we had a large size symptomatic sac-shaped aneurysm of the inferior pole branch of the right renal artery (Fig. 4. Fig.5) Giant false aneurysm of the right renal artery 44x55 mm. Given the size of the aneurysm, its localization, and signs of compression of the renal pelvis and pelvis system, we decided to perform open surgery. Anatomical features and mutual location of the proximal and distal segments of the renal artery branch after aneurysm resection allowed end-to-end anastomosis plasty of the artery without the need for a synthetic explant. Funding - The study was not sponsored.

CLINICAL OBSERVATION 4,

Patient K. 41 years old. Diagnosis: Atherosclerosis. Aneurysm of the renal artery aneurysms. Renal artery aneurysms and the cranial trunk. Resection of the aneurysm with end-to-end renal artery anastomosis was performed as the first step. Prosthesis of the right.

CLINICAL OBSERVATION 5.

X-ray endovascular embolization

Patient A., 61 years old. Diagnosis upon admission: (I72.2) Renal artery aneurysm. (Complaints upon admission): increased blood pressure up to 180-200 mm Hg, aching pains behind the sternum with irradiation, in the left scapular region appearing during physical exertion (Anamnesis of the disease):

He considers himself ill for 5 years, when anginal pains appeared for physical exertion. He was observed by a cardiologist at his place of residence with a diagnosis of coronary heart disease, arterial hypertension 3 stepan. takes Cardiomagnil 75 mg, Plavix 75 mg, Concor 2.5 mg, Hypotensive drugs. blood pressure max. up to 180-200 mmHg.:

Dis registered with a cardiologist for. The condition after stenting of the spacecraft from 2018. Taking into account the endocrinologist - type 2 diabetes mellitus insulin dependence.

Objective data: General condition on admission was of moderate severity, stable, due to underlying pathology.

Course of the intervention. After treating the surgical field under MIA (Sol.Novocaini 0.5% - 40 ml), the right common femoral artery was punctured and catheterized according to Seldinger. Then the angiography of the left renal artery was performed (Fig. 6). The guidewire was then guided into the aneurysm cavity and a Branstein5F catheter was delivered. The catheter delivered MWCE

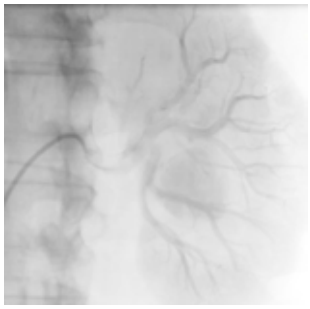

***FIGURE 13** - Angiogram. Clinical observation 5, Angiography of the right renal artery: the renal arteries are clear, but there is an aneurysm in the lower segmental branch (possibly a breakthrough in the cyst). Size of the aneurysm is 4.5x5.0 mm. - rounded shape.*

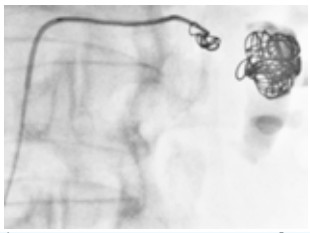

***FIGURE 14** - Surgery: Angiography of the left renal artery. Transcutaneous transluminal spiral embolization and false renal artery aneurysm.*

35-14-12 - 2 units, Netser - MWCE 35-14-10- 2 units, Netser MWCE - 35-14-8- 1 unit. Then a Rebar 2.7F microcatheter was inserted into the aneurysm cavity, the catheter was flushed with saline, DSMO 2.4ml was injected and Onyx embolizing agent 34ml - 6ml was injected to embolize the residual aneurysm space. Further, MWCE Netser 35-14-6- 1pc was inserted into the orifice of the driving artery. Further, after stenting of the right ABO, a JR5F catheter was inserted through the ovaries of the stent. The spirals were performed, and the Control angiography showed the false aneurysm to be completely uncontrasted, indicating an effective procedure (Fig 7).

The catheter and intraductor on the right side were removed. The artery was clamped for 40 minutes. Aseptic dressing was applied to the puncture site. There were no complications during the operation.

After aneurysm embolization, aneurysm contrasting was completely eliminated.

Conclusion

Thus, visceral artery aneurysms are detected when complications occur or accidentally during examination for other gastrointestinal tract diseases aimed to determine their functional significance.

During the last 10 years 31 patients with abdominal visceral artery aneurysms were under our observation. 10 patients had renal artery aneurysms, 15 - splenic artery aneurysms, hepatic artery aneurysms and pancreaticoduodenal artery aneurysms were revealed in one case each. Combination of aneurysms - in 2 cases: in one case the renal artery with the splenic artery, in another - the renal artery and the splenic trunk. The patients ranged in age from 24 to 78 years, mean age 43±6.5.

Previously, infection was considered the most frequent cause of splenic artery aneurysm in 10 cases, with most patients complaining of fever, abdominal pain, and a throbbing mass in the abdomen. And two patients with splenic artery aneurysm noted abdominal trauma. Three had atherosclerotic changes. The causes of renal artery aneurysms were atherosclerosis in 6 cases, fibromuscular dysplasia in 2 cases, and Nonspecific aortoarteritis in 2 cases. Also, atherosclerotic etiology is present in aneurysms of the external iliac arteries.

Reconstruction on hepatobiliary aneurysms was performed in 6 (20%) cases, resection with end-to-end anastomosis in 5 cases and resection of splenic artery aneurysms in 2 cases, resection of splenic artery aneurysms with an autovenous patch, clipping of splenic artery aneurysms in 2 cases (6.5%), endovascular techniques were used in 18 cases (58%).

In 2 cases nephrectomy was performed due to aneurysm spreading into the renal collar and absence of conditions for reconstruction.

In the nearest and in the distant (in 6 months and 3 years) postoperative period the preservation of the organ function in reconstructive and ligating methods of surgical treatment was the same. Signs of ischemia and impairment in the immediate postoperative period were not observed in reconstructive and ligating methods of surgical treatment.

Thus, visceral artery aneurysms are a rare vascular disease and are often complicated by rupture and thrombosis of distal arterial sections, which lead to organ ischemia. The choice of treatment method depends on the severity of the patient's condition, clinical manifestations, as well as aneurysm localization and its morphology. Preference is given to endovascular techniques, which are less traumatic and provide a good long-term result. However in each case the tactics of patient management is individual, the choice of optimal treatment of visceral artery aneurysms is based on the data of the whole range of possible diagnostic manipulations.

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