

ХИРУРШКО ЛЕЧЕЊЕ АНЕУРИЗМЕ ТРБУШНЕ АОРТЕ

SURGICAL TREATMENT OF ABDOMINAL AORTIC ANEURYSM



Иван Р. Марјановић, доцент

Војномедицинска академија,
Универзитет одбране,
Медицински факултет,
Клиника за васкуларну и
ендоваскуларну хирургију
Црнотравска 17, Београд
sofijaivan@gmail.com

Ivan R. Marjanović, Assistant Professor

Military Medical Academy,
University of Defense,
School of Medicine,
Clinic for Vascular and Endovascular
Surgery
Crnotravaska 17, Belgrade
sofijaivan@gmail.com

This monograph presents basic information about abdominal aortic aneurysm, including the history of treating this disease, risk factors for the appearance of the disease, as well as current epidemiological data and diagnostic procedures for detecting the disease. Presenting the only two methods of treatment, open and endovascular technique, the importance of indication for operative treatment has been shown at the same time, elective as well as urgent when life-threatening complications appear.

Consensus reached within the document from 1991, adopted by the World's Association of Vascular Surgeons and North American Association of Cardio-Vascular Surgeons defines aneurysm disease of aorta as "a pathological aorta's expansion for more than 50% of its normal diameter of lumen". Normal aorta in its part from branching off renal arteries to the crossroads of iliac arteries has transverse diameter 16–20 mm. When the expansion of aorta to 3 cm and more happens, it is said that abdominal aorta is aneurysm changed. Infra-renal part of aorta is the most frequent localization of the aneurysm appearance in aorta

and it counts to 63% compared with all other places on aorta. In most of the patients, the beginning expansion of aorta, happens after the age of 55 years. Abdominal aortic aneurysm is the cause of death in 1.5–2.0% of male population and 0.5–0.7% of female population with every day tendency for further increase of these numbers.

According to death outcome, aneurysm disease of abdominal aorta is on the 13th place of the leading death causes in the world, and on the 9th place in people older than 65 years. Aneurysm disease is multifactorial, and the occurrence of abdominal aortic aneurysm happens due to mutual action of more diverse pathological processes on the aorta's wall itself. It has been proved that men get the disease more frequently (5:1), as well as those who smoke, have diabetes or hypertension. In addition, it has been found that family tendency towards the appearance of abdominal aortic aneurysm (genetic predisposition) exists, and that people affected by the chronic obstructive pulmonary disease are more prone to the appearance of aneurysm. In the etiological basis of the abdominal aortic aneurysm appearance,

it is assumed that degenerative processes of collagen and elastin in the wall itself, as well as local inflammatory conditions, and ischemia of the wall lead to the wall's weakening and aneurysm appearance.

Aorta's expansion may be uniform, more exactly along the circumference of the wall, when we talk about fusiform aneurysm and expansion of only one part of circumference of the wall, when we talk about saccular aneurysm. The most frequent symptoms in patients with abdominal aortic aneurysm are: swollen stomach, uneasiness in stomach, periodical, dull bothering pain in the navel area, as well as pain in lumbosacral spine. When the aneurysm presses the surrounding structures, for example nerves, it may be presented as an ischialgic pain. If thrombus is created in the whole aneurysm, which fortunately happens rarely, due to the loss of circulation in legs gangrene of the lower extremities develops, whereas if distal embolization happens due to thrombus from aneurysm, ischemia of the seized extremity develops.

The most significant and at the same time the most dangerous complication of abdominal aortic aneurysm is its rupture, and it is directly in correlation with the aorta's diameter itself. Symptomatology of the ruptured aneurysm is reflected by the condition and clinical picture of hemorrhagic shock. According to the world literature, in 50% of patients who had the aneurysm rupture, death comes before they get to the hospital, while 50–70% of those who were operated die during or immediately after the operation. Operative treatment is the only way of treating abdominal aortic aneurysm and presents a surgical reconstruction of the diseased segment, with an artificial prosthesis – allograft. Regarding that, in most cases surgical treatment of abdominal aortic aneurysm is prophylactic, that is elective, in order to prevent the rupture of the aorta by reconstructing it, it is necessary that the reconstruction itself has a smaller risk than the natural course of the disease. Having that in mind there are three important factors that determine the moment and necessity for curing the patient with the abdominal aortic aneurysm. These are:

1. elective surgical risk,
2. expected risk of the rupture of abdominal aortic aneurysm,
3. expected patient's survival, having in mind comorbid conditions of the patient without operation.

Basically, for the first two conditions cross diameter of the abdominal aortic aneurysm is really important and therefore, it influences a lot the surgical plan. Basic indications for elective surgical treatment of abdominal aortic aneurysm are: maximum transverse diameter of the abdominal aortic aneurysm (fusiform aneurysm with 5.5 cm diameter or more, saccular 4.5 cm or more), then the growth of the diameter for 0.5 cm or more during one year, as well as all symptoms of the abdominal aortic aneurysm (pain in abdomen or back, distal embolization).

Special attention in this monograph has been dedicated to clinical and biochemical parameters during the postoperative course after the endovascular as well as after open, classic surgical repair of abdominal aortic aneurysm. A special significance of this monograph is a wide aspect of the analysis of body's immunological response after the application of these two techniques, by observing the system immunological response reflected in the serum concentration of key T helper (T_h) 1 cytokines (interleukin 2, interferon-gamma, interleukin 12), key T_h 2 cytokines (interleukin 4, interleukin 5, interleukin 6, interleukin 10), as well as key inflammatory cytokines (interleukin 1 beta and tumor-necrotizing factor alpha) and chemokines (interleukin 8).

Technologically technical progress and vascular surgery development at the beginning of the twenty first century made it possible for the patients to choose endovascular technique as a method in treatment besides classic surgical repair of abdominal aortic aneurysm.

Numerous studies in the last ten years, which compare these two surgical methods, have showed that patients treated with elective endovascular repair have easier postoperative course and faster postoperative recovery; fewer complications in the early postoperative

period, lower mortality rate and reestablish full working and life ability more quickly.

Namely, researches showed that patients treated with elective endovascular abdominal aortic aneurysm repair had fewer systemic inflammatory reactions in the immediate postoperative course compared with patients who were treated with elective surgical repair of abdominal aortic aneurysm.

This monograph present that endovascular abdominal aortic aneurysm repair presents significantly less traumatic and invasive surgical method for the patient in comparison with open, classic surgical repair and it is the method of choice in patients with significant comorbid conditions, in who the open repair is connected with high perioperative and postoperative risk. The application of iodine contrast, which is characteristic of endovascular abdominal aortic aneurysm repair, influences significantly renal function in patients treated with this method.

On the current level of technological progress of endovascular surgery materials, there are two main shortcomings of this surgical procedure. The first is the fact that the endovascular abdominal aortic aneurysm repair cannot be performed on each patient from technical reasons, in contrast to open surgical repair. The second shortcoming of this type of surgical treatment are numerous distant complications which appear a few years after the operation and which demand either secondary endovascular repair or open surgical treatment. However, adequate choice of patients and adequate indications for endovascular abdominal aortic aneurysm repair make this surgical technique completely reliable and safe for the patient with minimally invasive repercussions on the body as a whole during and immediately after the operation. At the present time and with currently available technology, endovascular procedure presents an ideal solution, first of all for patients at high risk for whom abdominal aortic aneurysm repair is indispensable.

У овој монографији изнете су основне информације о анеуризматској болести трбушне аорте, укључујући и историјат лечења ове болести, факторе ризика за настанак обољења, као и актуелни епидемиолошки подаци и дијагностичке процедуре за детектовање болести.

Приказани су: два основна модалитета хируршког лечења, ендоваскуларна реконструкција и отворена, класична хируршка реконструкција трбушне аорте уз индикације за оперативно лечење.

Посебна пажња посвећена је компаративној анализи клиничких и биохемијских параметара током постоперативног тока

као и компарацији широког аспекта анализе имунолошког одговора организма након примене ове две технике, праћењем системског имунолошког одговора.

Ова монографија биће од помоћи другим истраживачима да у будућности својим радом и истраживањима још више разјасне базичне патофизиолошке и имунолошке механизаме за процес настанка и еволуције анеуризматске болести аорте. Треба истаћи њен практични значај за лекаре приликом будућег планирања приступа у хируршком лечењу пацијената са анеуризматском болешћу трбушне аорте.