

OPIS PRZYPADKU / CASE REPORT

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Tętniak aorty brzusznej pęknięty do żyły głównej dolnej z przetoką aortalno-kawalną – opis przypadku i przegląd literatury***Abdominal aortic aneurysm ruptured to the inferior vena cava with aorto-caval fistula – case report and literature review*****Julia Siek¹, Michał Borys²**¹ Studenckie Koło Naukowe przy II Klinice Anestezjologii i Intensywnej Terapii
Uniwersytet Medyczny w Lublinie² II Klinika Anestezjologii i Intensywnej Terapii Uniwersytet Medyczny w Lublinie**Streszczenie**

Tętniaki aorty brzusznej (AAA - *aneurysma aortale abdominalis*) najczęściej lokalizują się poniżej ujścia tętnic nerkowych i powyżej rozdwojenia aorty. Pojawiają się one częściej u mężczyzn i u osób palących. W zdecydowanej większości przypadków tętniak aorty brzusznej powstaje na skutek nadmiernej degradacji macierzy zewnątrzkomórkowej, która wynika z nacieków zapalnych w ogniskach miażdżycy i produkcji działających destrukcyjnie enzymów proteolitycznych w tych miejscach. Błazki miażdżycowe upośledzają dyfuzję składników odżywczych i produktów przemian pomiędzy światłem, a ścianą i dodatkowo również bezpośrednio uciskają leżącą poniżej błonę środkową. Prowadzi to do martwicy błony środkowej i ścieńczenia ściany tętnicy. W bardzo rzadkich przypadkach może dochodzić do powikłań, przykładowo wytworzenia przetoki aortalno-kawalnej. Autorzy chcieli przestawić przyczyny tętniaka aorty brzusznej oraz ryzyko powikłań na podstawie opisu przypadku i przeglądu literatury. *Anestezjologia i Ratownictwo 2022; 16: 72-75. doi:10.53139/AIR.20221609*

Słowa kluczowe: tętniak aorty brzusznej, przetoka aortalno-kawalna

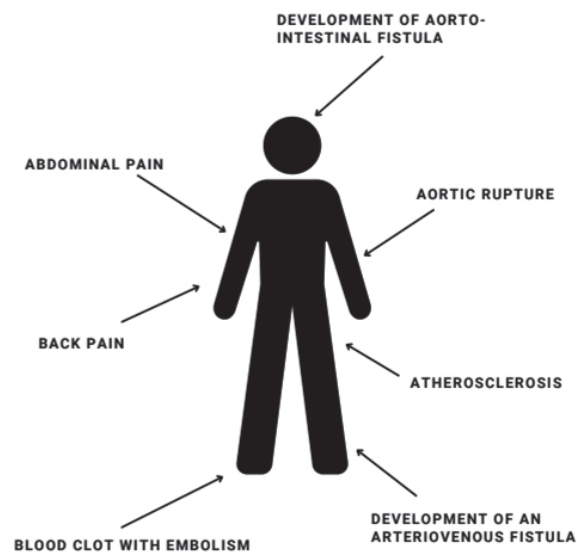
Abstract

Abdominal aortic aneurysms (AAA-*aneurysma aortale abdominalis*) are most often located below the opening of the renal arteries and above the bifurcation of the aorta. They appear more often in men and in smokers. In the vast majority of cases, an aneurysm of the abdominal aorta is caused by excessive degradation of the extracellular matrix, which results from inflammatory infiltrates in atherosclerotic foci and the production of destructive proteolytic enzymes in these places. Atherosclerotic plaques interfere with the diffusion of nutrients and products of changes between light and the wall, and additionally, they also directly press the underlying medial membrane. This leads to intimal necrosis and thinning of the arterial wall. In very rare cases, complications may occur, for example, formation of an aortic-caval fistula. The authors wanted to present the causes of the abdominal aortic aneurysm and the risk of complications based on a case report and a literature review. *Anestezjologia i Ratownictwo 2022; 16: 72-75. doi:10.53139/AIR.20221609*

Keywords: abdominal aortic aneurysm, aorto-caval fistula

Introduction

An abdominal aortic aneurysm is often defined as the maximum diameter of the abdominal aorta that exceeds 3 cm in the antero-posterior or transverse plane, or alternatively as a focus dilation ≥ 1.5 times the diameter of the normal adjacent artery [1]. It is assumed that aneurysm growth and the risk of rupture are associated with heavy smoking, female gender and chronic lung disease [1]. Most AAA is asymptomatic and is detected incidentally during various imaging examinations, including abdominal ultrasound and computed tomography angiography [1]. AAA has some clinical consequences, such as occlusion of the vessel lumen, embolism, pressure on adjacent structures or rupture [2]. Some patients develop AAA complications. Extremely rare, occurring only in about 1-6% of cases, is the formation of aorto-caval fistula [3].



Rycina 1. Objawy AAA

Figure 1. Symptoms of AAA

A case report

A 66-year-old man was urgently admitted to the Department of Vascular Surgery and Angiology SPSK 1 (Independent Public Clinical Hospital No. 1) in Lublin due to an abdominal aortic aneurysm ruptured into the inferior vena cava. An operation (laparotomy) was performed, during which the aortic-cavity fistula was sutured and a bifurcated aortic-bifacial prosthesis

was implanted. After the operation, the patient was immediately transferred to the ICU (Intensive Care Unit) SPSK 1 in Lublin. On the first day after admission, the patient's condition was severe, albeit stable. The patient was under the influence of RASS-4 (Richmond Agitation-Sedation Scale) analgo-sedation. A symmetrical vesicular murmur was auscultated. The circulatory system remained ineffective and required an infusion of norepinephrine and fluid therapy. The patient has been given a brachial catheter. Haemodynamic monitoring using the transpulmonary thermodilution method was implemented. On physical examination, the pulse was compressed in the arteries of the same name in the arms and legs. Due to the high level of renal parameters, without any mention of previous renal failure, high potassium levels and significant oliguria, CVVHD (Continuous Veno-Venous Hemodialysis) Ca-Ca replacement therapy was initiated after prior insertion of a dialysis catheter. The patient's body temperature was lowered, and active heating of the patient was started. On the third day, the patient's condition was average. He remained conscious in logical contact. The circulation was unstable, with a tendency to bradycardia of approximately 50 beats per minute and to hypotension. The patient was administered a continuous infusion of norepinephrine under the control of hemodynamic monitoring PICCO (Pulse Contour Cardiac Output). The features of hypovolemia were present, so a fluid bolus was ordered.

Tabela 1 Porównanie wyników morfologii pacjenta
Table 1. Comparison of patient morphology results

	01.04.2022	04.04.2022
HCT	27.9%	27.8%
HGB	9.3 g/dl	9.3 g/dl
MCH	30.5 pg	30.4 pg
MCHC	33.3 g/dl	33.5 g/dl
MCV	91.5 fl	90.8 fl
MPV	10.70 fl	11.10 fl
PLT	152 K/uL	244 K/uL
RBC	3.05 M/uL	3.06 M/uL
WBC	8.75 K/uL	12.18 K/uL

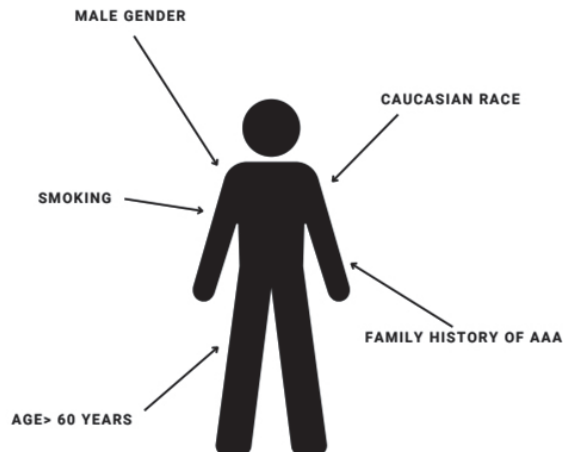
HCT-hematokryt, HGB-hemoglobina, MCH-średnia zawartość hemoglobiny, MCHC-średnie stężenie hemoglobiny, MCV-średnia objętość krwinki, MPV- średnia objętość płytki krwi, PLT-trombocyty, RBC-krwinki czerwone, WBC-krwinki białe. HCT-hematocrit, HGB-hemoglobin, MCH-mean hemoglobin content, MCHC-mean hemoglobin concentration, MCV-mean corpuscular volume, MPV- mean platelet volume, PLT- thrombocytes, RBC- red blood cells, WBC- white blood cells.

The heart rate in the peripheral arteries was preserved. Edema was absent. The abdomen was soft, tender in the mesogastrium and lower abdomen on superficial palpation. On the sixth day of stay in the ward, the patient's general condition was average. He was conscious, in full logical contact. He breathed spontaneously with passive oxygen therapy through a face mask. The circulatory system remained efficient, haemodynamically monitored, with periodic tendency to bradycardia. The abdomen remained soft, slight tenderness on palpation. He wasn't feverish. On that day, the patient was transferred to the home ward - Department of Vascular Surgery and Angiology.

Discussion

The creation of an aortic-caval fistula is a huge burden for the patient's heart. This is a very rare complication of an abdominal aortic aneurysm. It requires quick and decisive action. They are diagnosed only in half of the cases, which significantly increases postoperative mortality [4]. Other clinical consequences of abdominal aortic aneurysms include occlusion of the vessel lumen, obstruction with plaque material, compression of adjacent structures, abdominal mass, often pulsating on palpation, stimulating a tumor in the abdominal cavity, and rupture with abundant, often fatal, peritoneal hemorrhage or retroperitoneal tissues [2]. The risk of an aneurysm rupture depends on the size of the lesion. Abdominal aortic aneurysms up to 4 cm in diameter almost never rupture, while the risk of rupture of aneurysms from 4 cm to 5 cm is only 1% per year [2]. The risk increases to 11% annually if the aneurysm is 5-6 cm in diameter, and in the case of lesions over 6 cm in diameter, it is up to 25% annually [2]. For this reason, aneurysms that reach more than 5 cm are treated surgically either by open surgery and implantation of an artificial prosthesis, or by intravascular insertion of a stentgraph, i.e. a wire mesh covered with a fabric that expands [2]. The time of the operation is very important here, because in the case of prophylactic procedures performed on non-ruptured aneurysms, the mortality rate is about 5%, while when surgical intervention is urgent, due to an already ruptured aneurysm, the mortality increases to 50% [2]. Atherosclerotic true aortic aneurysms develop much more frequently in the abdominal aorta than in other arteries. Once an aneurysm has developed, its natural

course is to grow until it ruptures. The growth rate is variable, but it can be said that on average it amounts to approximately 1.5 mm in diameter in the thoracic segment and 4 mm in the abdominal aorta per year [5]. Imaging tests, such as ultrasound or computed tomography, are one of the most useful diagnostic methods for aortic aneurysms [5]. It is very important to examine atherosclerotic changes in other arteries, for example in the coronary or cerebral arteries, which are responsible for perioperative death or late complications [5]. In the endovascular era, the management of aneurysms slightly changed, but most patients decided to repair abdominal and thoracic aneurysms using a stent graft [6].



Rycina 2. Czynniki ryzyka rozwoju AAA
Figure 2. Risk factors for AAA development

Summary

Understanding the vascular condition of an abdominal aortic aneurysm is important to primary care, emergency medicine, specialist physicians and vascular surgeons. Awareness of the risk factors for aneurysm degeneration and the nature of medical and diagnostic procedures on the part of patients allows doctors to conduct screening tests in appropriate patient populations, which reduces the mortality associated with aneurysm rupture. Developing modern endovascular techniques have meant that more and more patients qualify for less invasive repair procedures, which is associated with fewer complications, and this in turn translates into greater patient survival.

Konflikt interesów / Conflict of interest
Brak / None

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