

RUPTURED ABDOMINAL AORTIC ANEURYSM — OUTCOMES IN THE LAST TEN YEARS

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RUPTURA VÝDUTĚ ABDOMINÁLNÍ AORTY — VÝSLEDKY POSLEDNÍCH 10 LET

Abstract

Podlaha J, Gregor Z, Roubal P, Horky B, Dvorak M:
Ruptured abdominal aortic aneurysm — outcomes in the last ten years
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Ruptured abdominal aortic aneurysm (AAA) remains to be represent a common and highly lethal problem. We reviewed the records of 92 patients (73 men and 19 women) operated on for ruptured infrarenal AAA within the past 10 years (January 1989 to October 1999) in the 2nd Department of Surgery in Brno, Czech Republic. The mean age was 71 years (range 57 to 92 years). Only 10 patients (10.9 %) were known to have an AAA before the rupture. Preoperative systolic blood pressure below 90 mmHg was present in 70 patients (76 %) and 15 patients (16.3 %) experienced cardiac arrest before surgery. The in-hospital mortality rate was 47.8 % (44 patients). Among the total of 92 patients, haemoperitoneum was discovered only in 30 patients (32.6 %) with the mortality rate of 40 % (12 patients). In 62 patients (67.4 %) also hemoperitoneum was present, the mortality rate was 51.6 % (32 patients) in these patients. Multiorgan failure due to an irreversible hemorrhagic shock was the main cause of death in 23 patients (25 %). Further causes were: heart failure — 8 patients (8.7 %), pulmonary complications — 5 patients (5.4 %), renal failure — 4 patients (4.3 %), bleeding — 3 patients (3.3 %), and sepsis — 1 patient (1.1 %). The patient's prognosis depends on early diagnostics and on the quality of preoperative and postoperative care. (Tab. 2, Ref. 8.)

Key words: ruptured abdominal aortic aneurysm, aorta, preoperative and postoperative care.

The incidence of abdominal aortic aneurysms depends on atherosclerosis; they are mostly located under the origin of renal arteries. AAA is often found during routine examination of the digestive tract. Some aneurysms grow very slowly for many years. Elective operations of abdominal aortic aneurysms have

Abstrakt

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Rupturovaná výduť abdominální aorty (AAA) představuje známý problém s vysokou letalitou. Tato studie předkládá sestavu 92 pacientů (73 mužů a 19 žen) operovaných pro rupturu infrarenálního úseku AAA během posledních 10 let (leden 1989 až říjen 1999) na II. chirurgické klinice v Brně. Průměrný věk byl 71 let (rozmezí 57 až 92 let). Jen 10 pacientů (10,9 %) mělo diagnostikované aneurysma abdominální aorty před rupturou. Předoperační systolický tlak pod 90 mmHg byl přítomen u 70 pacientů (76 %) a u 15 (16,3 %) pacientů byla registrovaná srdeční zástava před operačním zákrokem. Zemřelo celkem 44 pacientů (tedy mortalita 47,8 %). Z celkového počtu 92 pacientů bylo přítomno pouze hemoretroperitoneum u 30 pacientů (32,6 %) s mortalitou 12 pacientů (40 %). U 62 pacientů (67,4 %) bylo přítomno i hemoperitoneum, mortalita u těchto pacientů byla 51,6 % (tzn. 32 pacientů). Hlavní příčinou smrti bylo multiorgánové selhání — 23 pacientů (25 %) jako důsledek ireverzibilního hemoragického šoku. Dále pak srdeční selhání — 8 pacientů (8,7 %), plicní komplikace — 5 pacientů (5,4 %), renální selhání — 4 pacienti (4,3 %), krvácení — 3 pacienti (3,3 %) a sepsis — 1 pacient (1,1 %). Prognóza pacientů závisí na rychlosti diagnostiky a kvalitě preoperační a pooperační péče. (Tab. 2, lit. 8.)

Klíčová slova: rupturovaná výduť abdominální aorty, aorta, preoperační a pooperační péče.

a rather low mortality rate of 2—5 % in contrast to ruptured aneurysms with a mortality rate of 21—70 %. However, small aneurysms can rupture too, or they may be the cause of peripheral embolization, and in some cases they can cause aortocaval fistulas.

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According to the vascular operation registry, in the Czech Republic, the mortality rate in elective operations of abdominal aortic aneurysms was 8,1 %. In contrast, the mortality rate in urgent surgeries was 49 %.

Methods

The algorithm of our process in suspected AAA rupture is as follows: if the patient has a stable blood pressure above 90 mmHg, the diagnosis can be confirmed by computed tomography. Ultrasonography is a unique examination for the diagnostics of an aneurysm, CT however can better determine the height of the ruptured aneurysm. As the rupture cannot be palpated, CT is a great contribution, however it should not hinder the patient on his way to the operating theatre, where the acute patient must be as soon as possible.

The surgical intervention depends on the need for blood pressure stabilizing, therefore we put a vascular clamp in the retroperitoneum below the origin of renal arteries as soon as possible, and only then, after replenishment of the circulating blood volume we manage the arterial affection itself — using tubular or bifurcated vascular prostheses. If possible, we perform the minimal possible intervention, we prefer tubular and aortoiliac prostheses to aortofemoral ones.

We used two types of prostheses:

- 1) Tubular or Czech bifurcated prosthesis with collagen from the Research Institute of Hosiery in Brno
- 2) GORETEX prosthesis.

Characteristics of the study group

This study presents a group of 92 patients (73 men and 19 women) operated on for a ruptured infrarenal AAA during the last 10 years (January 1989 — October 1999) in the 2nd Department of Surgery in Brno, Czech Republic. Mean age was 71 years (range 57–92 years). Only 10 patients (10.9 %) were known to have an abdominal aortic aneurysm before the rupture. Preoperative systolic pressure below 90 mmHg was found in 70 patients (76 %), and 15 patients (16.3 %) experienced cardiac arrest before surgery.

Tab. 1. Frequency of ruptured AAA.

Rupture into Ruptura do	%
retroperitoneum retroperitonea	88
retroperitoneum and abdominal cavity retroperitonea i do volné dutiny břišní	7,6
retroperitoneum and duodenum retroperitonea i do duodena	2,2
retroperitoneum and caval vein retroperitonea i do vena cava	2,2

Results

Among the risk factors, we recorded smoking in 64 %, chronic ischaemic heart disease in 60 %, hypertension in 51 %, and disorders of lipid metabolism in 43 % of patients.

Duration of the surgeries varied between 1 hour 50 minutes and 6 hours 30 minutes, with the average of 3 hours.

44 patients died, the mortality rate was 47.8 %. Among the total of 92 patients, only hemoretroperitoneum was present in 30 patients (32.6 %) with a mortality rate of 40 % (12 patients). In 62 patients (67.4 %) also hemoperitoneum was present; in this patients, the mortality rate was 51.6 % (32 patients).

Multiorgan failure due to an irreversible hemorrhagic shock was the main cause of death — 23 patients (25 %). Further causes of death were: heart failure — 8 patients (8.7 %), pulmonary complications — 5 patients (5.4 %), renal failure — 4 patients (4.3 %), bleeding — 3 patients (3.3 %), and sepsis — 1 patient (1.1 %).

Discussion

Differential diagnostically we must think just of the diagnosis of a ruptured abdominal aortic aneurysm in patients over 60 years of

Tab. 2. Mortality rates in operations for ruptured AAA.

Author	City	Country	Year	No.	Mortality rate (%) due to rupture into cavity		
Autor	Město	Krajina	Rok	Č.	Úmrtnost (%) při ruptuře do dutiny retroper. + perit. celkem		
Daring	Albany	USA	1996	104			28
Mackiewicz	Bydgosz	Poland	1998	78	41	75	58
Ouriel	Rochester	USA	1990	243			55
Panneton	Montreal	Canada	1995	112			49
Rubini	Parma	Italy	1996	54	39	73	56
Shih	Taipei	Taiwan	1998	52	25	87	56
Subramaniam	Horsham	Australia	1998	41			67
Podlaha	Brno	Czechia	1999	92	40	52	48

age with severe abdominal, hip, back and groin pains combined with a pulsating abdominal mass and hypotension. The symptoms may include lower limb pain, or a heart disease, but they need not be present; however both of them are found very frequently. The patient's life saving depends on the speed of resuscitation and management of aortic bleeding. It is necessary to make a venous approach immediately and to increase the intravascular volume first with the use of crystalloid and colloid solutions until transfusions are prepared. Urinary catheter is routinely inserted and diuresis is followed.

Frequency of ruptured AAA according to the location (Schilberg and Valesky, 1987) (Tab. 1).

According to the study of F.W. Schildberg and M.M. Heiss (1998), mortality is relatively low in elective AAA operations: 2—5 %. In ruptured AAA, the mortality rate is disproportionately higher: 21—70 %, with the mean mortality rate of 55 %.

According to literature data, mortality rates in operations for ruptured AAA are as follows: (1, 3, 4, 5) (Tab. 2).

Conclusions

Immediately after admission of a patient with ruptured AAA, team cooperation is necessary. Only radical surgery in a sufficiently short time can save the patient. Patients with hypotension (blood pressure below 90 mmHg) must be urgently transferred to the operating theatre for an invasive intervention.

We can affirm that patients with early recognized ruptures, in which hemoperitoneum has not developed yet, and only hemoretroperitoneum is present, have extremely higher chance to survive. Unfortunately, patients repeatedly have to wait for diagnosis even longer than one day. In the meantime, secondary rupture into the peritoneal cavity develops and the patient's life is immediately threatened.

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