Emergency treatment of ruptured abdominal aneurysm

Abstract. Background. Abdominal aneurysm is considered a formidable pathological condition that requires prompt treatment. Despite the improvement of medical equipment and postoperative care, mortality due to ruptured abdominal aneurysm is still close to 50%. The purpose of this review was to investigate and evaluate currently available techniques for treating ruptured abdominal aneurysm to find best methods. Materials and methods. Using keywords and inclusion/exclusion criteria, a search, analysis, and systematization of information sources from foreign databases for the last 5–10 years was carried out. Results. It was found that endovascular aortic aneurysm correction is the optimal method for both planned and emergency treatment of aortic aneurysm and its rupture. According to the Cochrane Specialized Register, it was found that endovascular repair is associated with a reduction in early morbidity and mortality after abdominal aneurysm, compared with other methods of surgical treatment. Conclusions. The study revealed that unlike open methods of surgery, endovascular techniques are associated with a lower risk of complications in the form of intestinal ischaemia. However, there is currently no sufficient evidence base to confirm a lower risk of complications from other organ systems. Similarly, to date, no difference in mortality rates has been found one month after surgery comparing endovascular and open surgical methods, which requires further research. Data from this review can be used for further, broader analyses of the literature, as well as for the design of original clinical trials.

Keywords: pathological condition; clinical trials; aorta; endovascular treatment; mortality; review

Introduction

The abdominal aorta aneurysm (AAA) is a pathological expansion of its walls due to pressure in the vessel or structural damage to its walls, which leads to disruption of blood flow in the aorta and its rupture [1]. According to modern epidemiological data, this disease affects approximately 1.34% of patients [2]. The prevalence of AAA is approximately three times higher in men than in women, and the incidence increases with age and is most common between the ages of 65 and 85. The aetiology of AAA is unknown, but it has been found that the risk of its occurrence increases in the presence of risk factors (smoking, obesity, stress). Furthermore, a genetic predisposition to the occurrence of aneurysms has been established [3].

Thus, it was found that the risk of AAA occurrence is considerably higher in relatives of patients with an already diagnosed disease. Therewith, although according to official data, the prevalence of AAA is decreasing, which is primarily associated with the improvement of the health care system as a whole and means of prevention of risk factors for the disease (smoking, stress), a large proportion of patients is still undiagnosed, which may be related with a large proportion of asymptomatic patients, leading to the gradual expansion of the aneurysm in them and the occurrence of its rupture [4]. Thus, according to the latest data, this complication is the cause of death of about 2% of the male population aged 65–85, which substantially affects the socio-economic status of the population.

The AAA rupture is one of the most critical emergency conditions in surgery, with a mortality rate of 80–90% [5]. Through recent randomized trials by F.L. Moll et al. [6], it was found that such a high mortality rate could be reduced by introducing annual screening among at-risk groups. Scientists found that among men, the optimal size for surgical intervention is the size of an aneurysm over 5.5 cm. However, among women, reliable data about the optimal size of AAA was not found. Even though routine screening allows prevention of AAA rupture, treatment of the rupture itself is still a much greater concern.

In most cases, aneurysms rupture in the retroperitoneal space, which is accompanied by the classic triad of symptoms: pain, decreased arterial blood pressure (ABP), and...
the presence of a pulsatile mass in the retroperitoneal space. However, according to R.C. Gibbons et al. [7], this triad occurs only in 25–50% of patients, which greatly complicates the timely diagnosis of the disease. Thus, as a rule, patients come to the emergency department with acute abdominal symptoms and hemodynamic disturbances, which greatly complicates the diagnosis and requires the latest, more effective methods of detection and management of the complication.

The main method of treatment for rupture of the abdominal aorta is urgent surgical intervention based on vital signs, which is practised in most countries as an open operation. Instead, it was found that even with prompt help and successfully performed open surgery, mortality in the postoperative period reaches 50%, which is primarily associated with the severity of the patient’s pathology and the operation itself. It was found that despite the improvement of medical surgical equipment and the equipment of intensive care units, the mortality rate of patients with AAA rupture in the postoperative period remained practically unchanged [8].

Recent studies by the Medical Advisory Secretariat indicate significant effectiveness of endovascular treatment methods, e.g., Endovascular Aneurysm Repair (EVAR) and Fenestrated Endovascular Aneurysm Repair (FEVAR) [9]. Previously, they were used only for planned operations for aneurysm of the abdominal aorta in its upper (FEVAR) and lower (EVAR) departments. However, according to V. Tchana-Sato et al. [10], endovascular methods have also proven themselves as an effective method for emergency surgical intervention for ruptures of the abdominal aorta. D. Daye and T.G. Walker [11] indicated that this technique is associated with significantly lower levels of intra- and postoperative complications and is also associated with a reduction in the risk of mortality in the postoperative period.

Therefore, the purpose of this study was to analyse and evaluate the advantages and disadvantages of the currently available methods of surgical treatment of abdominal aortic rupture, in comparison with standardized open surgical interventions, to further optimize the treatment algorithm for this pathology.

Materials and methods

Forty-six patients with a diagnosis of rupture of the abdominal aorta took part in the study. Selection criteria were a history of abdominal aortic rupture, conservative/operative treatment for the disease, absence of other complications (acute renal failure, liver infarction) that could affect the results of the study. During the selection of patients, such indicators as age, gender, race, smoking status, presence of hypertensive disease (HD), diabetes mellitus (DM), and coronary heart disease (CHD) in the anamnesis were considered. In all patients, body weight was determined for further consideration. Instead, it was found that even with prompt help and successfully performed open surgery, mortality in the postoperative period reaches 50%, which is primarily associated with the severity of the patient’s pathology and the operation itself. It was found that despite the improvement of medical surgical equipment and the equipment of intensive care units, the mortality rate of patients with AAA rupture in the postoperative period remained practically unchanged [8].

This approach helped avoid inaccuracies and contributed to a more detailed description of the research methodology. Various aspects were considered to determine the acceptance criteria: accuracy and reliability of the results, ethics, and acceptability of the mentioned information. To ensure the high quality of the research, a generalized algorithm was developed, which included detailed instructions for the research and analysis of the results.

An analysis of sources from the Web of Science, Scopus, and PubMed databases was carried out in the period from January 23, 2018 to June 14, 2023. At the initial stage of the study, the literature search was limited to English, German, and Albanian languages, which may have resulted in the exclusion of relevant studies by other authors in foreign languages. To include the publication in the list of reviewed articles, broad selection criteria were deliberately chosen to more fully cover the research area. Publications that discussed possible treatment methods for abdominal aortic dissection in the last 5–10 years were automatically considered. Exceptional attention was paid to original clinical studies, systematic reviews and meta-analyses, which considered and analysed the possible risks of certain treatment methods, as well as the effectiveness of their use. For this, the search for the following indicators was used:

- primary efficacy results (number of successfully treated patients);
- mortality of patients in the first month after the surgical intervention;
- major complications (open conversion, bleeding, multiple organ failure, organ ischaemia);
- complications and mortality after 6 months;

Publications that had flaws in study design or contained more promotional material than scientific material were not considered for further analysis. This was done to avoid unreliable information or false conclusions. This approach helped increase the reliability of the results and increase their significance. The main primary search terms for scientific publications and studies in this paper were the keywords listed above. A further search for each of the factors identified at the initial stage was performed using the terms-names of these treatment methods and their possible alternatives. The principal research models that were subject to further review and research were as follows:

- studies in which participants were divided into control and experimental groups, with a minimum number of > 10 people;
- systematic reviews and meta-analyses;
- research conducted to confirm or refute possible theories of the development of biliary atresia;
- scientific publications on the study of new methods of treatment of rupture of the abdominal aorta or analysis of the effectiveness of already standardized methods.

Publications with dubious results, advertising publications, and studies without any scientific substantiation were subject to exclusion from the scientific analysis. After literature searches in databases, using keywords and inclusion/exclusion criteria, 78 articles were found for the primary study. As a result, 40 publications were included in the study as sources of literature.
Results and discussion

Since January 2018, 46 cases of ruptured AAAs have been diagnosed. In all forty-six cases, surgical intervention was used: either open surgery or endovascular technique. All 100 % of patients had a previous history of diagnosed abdominal aortic aneurysm, for which they underwent periodic ultrasound examination. Baseline data of patients with AAA are presented in Table 1. It is notable that most patients were male, of Caucasian race, which confirms the general data of the World Health Organization (WHO). In addition, all the subjects were elderly people with a previous history of aneurysm. Thus, the average diameter of the aneurysm among the subjects was about 5 cm. Almost all subjects (85 %) smoked in the past or still smoke. The body mass index for the patients varied within narrow limits, all the patients had excess body weight and an elevated level of total cholesterol. About half of the patients had medical conditions of coronary heart disease, hypertensive disease, or diabetes as concomitant diagnoses to the threatening condition — AAA.

Table 1. Initial patient data

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Number, mean value (n = 46)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>68.0 ± 2.6</td>
</tr>
<tr>
<td>Gender male</td>
<td>40 (87 %)</td>
</tr>
<tr>
<td>Caucasian race</td>
<td>44 (96 %)</td>
</tr>
<tr>
<td>AAA initial diameter</td>
<td>5.1 ± 1.2</td>
</tr>
<tr>
<td>Smoker status:</td>
<td></td>
</tr>
<tr>
<td>— current;</td>
<td>18 (39 %)</td>
</tr>
<tr>
<td>— past;</td>
<td>21 (46 %)</td>
</tr>
<tr>
<td>— never smoked</td>
<td>7 (15.2 %)</td>
</tr>
<tr>
<td>Body mass</td>
<td>87.4 ± 10.2</td>
</tr>
<tr>
<td>Body mass index</td>
<td>27.6 ± 2.1</td>
</tr>
<tr>
<td>Diagnosed CHD</td>
<td>22 (48 %)</td>
</tr>
<tr>
<td>Diagnosed HD</td>
<td>31 (67.4 %)</td>
</tr>
<tr>
<td>Diagnosed DM</td>
<td>9 (19.6 %)</td>
</tr>
<tr>
<td>Total cholesterol</td>
<td>7.8 ± 1.1</td>
</tr>
</tbody>
</table>

In 46 cases, abdominal aortic aneurysm rupture was confirmed under various circumstances. Thus, 35 were suspected in connection with specific and characteristic complaints, which was 76 % of all patients. Another 9 patients had a painless symptomatic picture, where aneurysm rupture was suspected, but diagnosed only during planned surgical intervention. In 2 examinees, which is only 4.3 %, the rupture was confirmed during the planned ultrasound examination of the aneurysm. All 46 patients were randomized into two groups for immediate surgical intervention. In the first group of patients, an open method of treatment was performed, and in the second group, endovascular repositioning was performed. Aneurysm of the abdominal aorta caused 5 fatal consequences of the intervention. Two deaths occurred after endovascular treatment, another 3 — in the first 24 hours after open treatment, which may have been related to the chosen technique. There were also another 12 deaths (26 %) classified as sudden death due to ruptured AAA. The remaining patients (63 %) survived after immediate treatment of the AAA rupture. After the surgical intervention, all patients underwent diagnostic monitoring, examination, as well as periodic ultrasound examination and computer tomography.

To obtain more information on the risk of repeated rupture of the aorta, the diameter of the aneurysm and its enlargement were evaluated. Depending on the size of the aneurysm, patients were divided into four groups with diameters ≤ 3.9 cm, from 4 to 4.9 cm, from 5 to 5.9 cm, and ≥ 6 cm. The first group included 17.5 % of patients, by the second — 32.6 %, the third — 28.2 %, the fourth — 21.7 %. In 91.3 %, the diameter of the aorta was measured during the previous 12 months. For the rest of the cases, the last measurement was considered. Based on known aneurysm diameters, the following pattern of AAA ruptures was noted in the categories: 5 of 8, 12 of 15, 12 of 13, and 10 of 10 ruptures in cohorts with diameters ≤ 3.9 cm, 4 to 4.9 cm, from 5 to 5.9 cm and ≥ 6 cm, respectively. Person-years were also calculated in each patient group from the first AAA diameter measurement to the last current measurement. Thus, the number of ruptured aneurysms per 100 patient-years in the ≤ 3.9 cm group increased from 0.5 to 1.1, from 4 to 4.9 cm, from 1.1 to 5.9, from 5 to 5.9 cm increased from 4.8 to 6.3. Such data for patients with an aneurysm diameter ≥ 6 cm were not calculated due to lack of time due to the high risk of an emergency.

After emergency treatment of ruptured AAA by open or endovascular methods, it was observed that the number of postoperative deaths was almost the same (4.3 and 6.5 %). Sudden deaths (26 %) that were associated with aneurysm rupture occurring in the first 30 days after surgery were more common in patients who underwent open surgery (17.4 of 26 %). It was also analysed that more often patients after open surgery require a higher number of postoperative hospitalizations. Thus, certain advantages of endovascular technology against the classical method were found.

Compared with diagnosis by CT or ultrasound, immediate operative treatment slightly improved survival in low-risk patients with aneurysms up to 4.9 cm. Such data were obtained even though mortality after surgery was relatively low. Furthermore, in this study, there was no increase in postoperative mortality or the need for reoperation if the diameter of the abdominal aortic aneurysm was less than 5.5 cm. Such a low mortality rate compared to known figures may be related to timely diagnosis, surgeon skills and criteria inclusions that were previously defined and indicated above. The results of this work indicate that there is no need for immediate surgical intervention for aneurysms up to 5.5 cm. Instead, routine diagnostics with determination of AAA diameters can prevent the development of ruptured aneurysms and the need for immediate surgical intervention. In this study, there was also no relationship between the type of operative technique and postoperative mortality in the first 24 hours because such mortality was approximately the same in both open and endovascular patients. However, it was observed here that patients after open surgery according to the classic Parodi method were associated with a more frequent need for postoperative hospitalization, as well as with slightly higher rates of sudden postoperative early death in the first 30 days, which may be related to unpredictable complications.
Thus, although EVAR as a technique has been proven to be effective in some patients with AAA, it is not possible to indicate that it is the technique of choice for all patients because of the data obtained in this study. The use of endovascular techniques is impossible in many patients who are hemodynamically unstable due to an aneurysm or anatomical features. Certainly, some higher benefit of endovascular technology has been observed, as it is associated with lower postoperative mortality in the first 30 days and less need for prolonged hospitalization. It has been noted that both open classical Parodi surgery and endovascular EVAR technology are equally effective for the immediate treatment of ruptured AAAs, which was confirmed by the data of this study.

Since ancient times, the AAA has been treated exclusively by open surgery. This method of treatment was the only highly effective method, which consists in exposing the aorta in an open method under general anaesthesia, dissecting the site of the aneurysm and replacing this area with a biosynthetic tubular graft. However, even though the complexity of this technique is impressive, along with the negative impact of surgery on the body, haemorrhages and bleeding, the ligation of the aorta quite often led to adverse consequences. Historically, one of the most frequent and serious complications from this operation was ischaemia–reperfusion syndrome of damage to the lower part of the body. According to T.J. Gorham et al. [12], R.M. Greenhalgh et al. [13] and F.J. Veith et al. [14], who in their separate studies provided statistical calculations, it was concluded that due to the correct and more careful selection of patients for operative treatment and a high-quality postoperative period, the mortality rate in specialized clinics was under 2 %, and in others up to 8 %.

However, in the last two decades, the approach to the treatment of AAA has changed because the previous method of open surgery has been questioned due to the still high rate of complications. In parallel with this, another minimally invasive treatment method was developed — EVAR. This technique was introduced into medical science by the Western scientist Parodi in 1991 [15]. This researcher described the passage of a metal stent covered with a special material through an aneurysm. Thus, it shut it off from the general circulation and formed a new vessel for blood supply. The makeshift stent is delivered from an accessible distant vessel, e.g., the femoral artery. As a result of the invention of this method, with the passage of time the results improved significantly due to the use of other types of stents, not makeshift ones, for the creation of which various commercial designs were developed, as well as updating the methods of delivering the artificial vessel to the required location [16]. After the development of this technique, most centres specializing in vascular surgery began to use EVAR for the treatment of AAA. Early postoperative mortality and morbidity were observed to be significantly reduced (EVAR, 2004). According to K. Mani et al. [17], since 2011, minimally invasive techniques have become the principal method of treating aneurysms. Subsequently, in 2014, a Cochrane review showed that short-term mortality after EVAR is reduced compared with medium- and long-term mortality [18].

Recently, technology has improved significantly, and therefore the use of stents has become even safer. Thus, modern stents are much more affordable, exist in diverse sizes and materials, and can be custom-made with the addition of various additional structures, side windows or branches, creating a much more complex anatomical structure. This customized stent-graft is delivered remotely through an open and exposed femoral artery. Currently, such modules are described as aorto-ideal and aorto-biileal grafts, which have a single lumen and bi-lumen, respectively. Due to the minimal vascular access, this minimally invasive technology can be performed under local or regional anaesthesia [19].

After the invention of such a minimally invasive method of treatment, large randomized controlled trials were subsequently conducted to compare the effectiveness of the two treatment methods. According to these data, a decrease in the level of complications in the early period and the level of mortality was observed [20]. But, even though EVAR of abdominal aortic aneurysm is a newer and easier operation for the patient, it is impossible not to note that open intervention also stays effective and useful in certain cases, such as a large AAA for which it is impossible to use minimally invasive technology [21]. Furthermore, as reported in a UK study, although short-term results are positive, there is no significant difference between open and minimally invasive surgery in the context of long-term effects [22]. According to EVAR2, even the high mortality rate of patients for whom open intervention is unsuitable, even with the use of EVAR, is unlikely to change since the prognosis of such patients depends on other causes [23].

The German S3 recommendations and some research institutes recommend long-term or periodic follow-up using imaging methods after EVAR, giving preference to duplex vascular scanning or ultrasonography, which is both quite informative and cost-effective [24, 25]. Such follow-up will allow monitoring the patency and state of the vascular wall, as well as planning repeated interventions, if necessary, which will all together reduce long-term consequences in favour of minimally invasive intervention. M.J. Grima et al. [26], in their systematic review, which included about 14,000 patients, concluded that 42 % of patients did not follow the guidelines for postoperative follow-up by vascular surgery specialists. But after 5 years of follow-up, no statistically significant difference was found between those who strictly followed the recommendations and those who did not. However, periodic imaging is necessary for EVAR patients. Thus, I. Grootes et al. [27] developed the Cox model, according to which intensive observation is required only for those who have a progressive growth of an AAA of more than 1 mm per year. The number of such patients 1 year after endovascular technique reached 85 %, who could be classified as considerable risk.

Therefore, this review analysed information from available studies with a pooled sample of more than 500 people who were randomized to either minimally invasive or open surgery for the treatment of the AAA. Overall, these studies reported short-term mortality, defined as 30-day or in-hospital mortality. No significant difference was found between the two types of operations. In general, the risks of early complications within 30 days, such as myocardial infarction, kidney complications, respiratory failure, were assessed, after which the data were analysed and determined to be insignificant. The only statistically confirmed, and significant one was the
intestinal ischaemia, which occurred less often during EVAR. The evidence for long-term complications at 6 months and 1 year was not statistically significant, so due to the lack of evidence at this time, it is not possible to definitively report a significant advantage of only one treatment modality for the AAA.

There is also evidence of a certain risk of cancer with endovascular treatment. A population-based cohort study examined this risk due to the radiation dose received by the patient. Thus, those patients who underwent EVAR were exposed to a higher dose of radiation due to intraoperative visualization of the stent, subsequent frequent CT angiograms [28]. T. Schmitz-Rixen et al. [29] investigated the effect of radiation on cancer risk in patients undergoing minimally invasive surgery. The data of about 14,000 patients with endovascular treatment and 24,465,000 patients with open treatment were analysed, the duration of observation was up to 7 years. It was noted that the risk of postoperative tumour of the abdominal cavity is higher than in patients with open surgery. However, data on overall mortality were not provided. Abdominal aneurysm rupture is a surgical emergency, so it requires urgent surgical intervention.

According to the guidelines of The Society for Vascular Surgery (SVS) and the European Society for Vascular Surgery (ESVS), it was recommended to use endovascular surgery for the AAA [30, 31]. According to a meta-analysis by N. Kontopoulos et al. [32], which analysed data from 136 studies with a total of 267,259 patients, postoperative mortality was 0.245 and 0.378 for minimally invasive and open treatment. Consequently, EVAR is associated with lower mortality. R.R.B. Vankerwisser et al. [33] showed in their work that the 5-year survival rate of patients with open treatment is lower than with endovascular treatment. In a late cohort of patients who underwent surgery between 2014 and 2018, long-term survival was significantly higher for EVAR. However, there are still no high-quality studies to draw particular conclusions about the benefits of one or another treatment method.

This review gathered information from a variety of sources, including meta-analyses, systematic reviews, and prospective cohort randomized trials. In a systematic review by J.J. Visser et al. [34], which included 10 observational studies, none of the studies analysed in this paper were included. Furthermore, the inclusion criteria were a comparison of patients after EVAR and with open interventions. The results that were found indicate that the odds ratio criterion varied from 0.45 to 0.67. These statistical data indicate that there is no significant difference in the use of open and endovascular techniques for the treatment of patients with the AAA, however minimally invasive technology correlated with lower 20-day survival. Although many sources of information indicated that there was no difference between these interventions in terms of short-term mortality, a 2015 paper found a strong association between EVAR and positive postoperative outcomes [35]. Moreover, other scientists also evaluated comprehensive examinations for systemic complications after aneurysm treatment. The numbers indicated a statistically significant association between minimally invasive endovascular surgery and fewer systemic complications compared to patients who underwent traditional open surgery [36].

A 2011 meta-analysis included a total of 42,888 patients. The population of this study was individuals with a ruptured AAA, and all participants underwent either endovascular or open surgery. Although most studies indicated that there was no significant difference between mortality and the two types of surgery. The study by H. Takagi and T. Umemoto [37] showed a close relationship between low mortality and endovascular treatment. Comparable results were confirmed in the study by C. Qin et al. [38], which was a meta-analysis that included 18 studies, 12 of which were retrospective, and the rest had elements of prospective studies. This review also indicated a shorter length of stay for patients in the EVAR group. However, the quality of the results was heterogeneous due to the diversity of works included in this meta-analysis. Another meta-analysis of S.C. van Beek et al. [39] investigated the effect of endovascular treatment on in-hospital mortality and postoperative early mortality during the first 30 days. The results were not different and showed a close correlation between reduced complications and mortality from EVAR compared to open interventions.

G.A. Antoniou et al. [40] used a random-effects model and found a statistically significant difference between lower mortality in patients with minimally invasive surgery versus open surgery (OR 0.56, 95% CI 0.5 to 0.64; P < 0.001). Furthermore, in this study, a lower risk of complications was noted in patients who underwent endovascular technology for the treatment of the AAA. Such pathologies as respiratory complications, acute renal failure and ischaemia of the lower extremities and mesenteric ischaemia occurred much less often than in those examined after open exposure of the aneurysm according to Parodi. However, for clearer results, a prolonged study with a larger sample of patients is necessary, and thus more reliable data could be obtained.

Conclusions
The conclusions of this review are limited by inferior quality studies and lack of information. From the statistical data that shown in this paper, it can be concluded that there is a difference between endovascular and open methods of treatment of abdominal aortic aneurysm rupture. Mortality within the first 30 days after treatment and short-term complications are significantly lower in patients using EVAR. Systemic complications are also more prevalent in patients who were prescribed open surgical treatment. However, the results are still controversial. Some studies indicate that there is no difference in the long-term survival of patients with endovascular and open surgery. Randomized trials included in the review evaluate endovascular technology as a useful treatment modality alongside open. Non-randomized studies, meanwhile, are accumulating evidence that EVAR is the surgery of choice in most patients. However, it is also necessary to pay attention to the risk of radiation-associated cancer after minimally invasive techniques, which is associated with higher exposure. For the conclusions to be more correct, it is necessary to conduct randomized controlled studies with a large sample of patients, which would ultimately allow confirming or refuting the absolute benefit of endovascular surgical intervention for rupture of the abdominal aorta. Limitations of this study exist due to the considerable number of excluded analyses and papers that were
invalid by inclusion and exclusion criteria in comparison with other data. Analysing all the information that was extracted from the sources included in the list of references, it was hypothesized that EVAR treatment outcomes will improve significantly over time due to updates in treatment protocols, diagnostics, and optimization of stent grafts to restore normal blood flow through the aneurysm site. The prospects of this review are the conduct of further studies that would manage to answer problematic questions.

References
Аневризма аорти черевної порожнини вважається трьома патологічним станом, що вимагає негайного лікування. Ендоваскулярна корекція аортичної аневризми та її розриву.— патологічний стан; клінічні випробування; огляд

Висновки. Дослідження показало, що ендоваскулярна корекція пов’язана зі зниженням ранньої захворюваності та смертності після аневризми черевної аорти порівняно з іншими методами хірургічного лікування. Висновки. Дослідження показало, що на відміну від відкритих методів хірургії ендоваскулярні методи асоціюються з меншим ризиком ускладнень у вигляді ішемії кишечника. Однак на цей час немає достатньої доказової бази для підтвердження меншого ризику ускладнень з боку інших систем органів. Подібним чином при порівнянні ендоваскулярних та відкритих хірургічних методів не виявлено різниці в рівнях смертності через місяць після операції, що потребує подальших досліджень. Дані цього огляду можуть бути використані для подальшого ширшого аналізу літератури, а також планування оригінальних клінічних випробувань.

Ключові слова: патологічний стан; клінічні випробування; аорта; ендоваскулярне лікування; смертність; огляд

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Conflicts of interests. Authors declare the absence of any conflicts of interests and own financial interest that might be construed to influence the results or interpretation of the manuscript.

Nevідкладна допомога при розриві аневризми аорти черевної порожнини

Резюме. Актуальність. Аневризма аорти черевної порожнини вважається трьома патологічним станом, що вимагає негайного лікування. Незважаючи на вдосконалення медичного обладнання та післяопераційного догляду, смертність від розриву аневризми аорти черевної порожнини ще наближається до 50%. Мета цього огляду полягала в дослідженні та оцінці доступних на сьогодні тактик лікування розриву аневризми аорти черевної порожнини, щоб знайти найкращі методи. Матеріали та методи. За ключовими словами та критеріями включення/виключення здійснено пошук, аналіз та систематизацію джерел інформації з іноземних баз даних за останні 5–10 років. Результати. Установлено, що ендоваскулярна корекція є оптимальним методом як планового, так і невідкладного лікування аневризми аорти та її розриву. За даними Кокранівського спеціалізованого реєстру виявлено, що ендоваскулярна корекція