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CORONARY HEART DISEASE AND CANCER

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Abstract

Coronary heart disease and oncological diseases occupy leading positions in the cause of mortality worldwide. The combination of coronary heart disease (CHD) and oncopathology, given the prevalence of both nosologies, is not uncommon. The presence of concomitant CHD in patients with malignant neoplasms in most cases serves as an aggravating factor complicating and / or limiting the treatment of oncopathology. Coronary heart disease in patients with oncopathology can increase the frequency of postoperative complications, hospital mortality, and reduce long-term survival after radical surgery for malignant neoplasm. Myocardial revascularization, performed as the first stage in patients with hemodynamically significant stenosis of the coronary arteries (CA), is the main method of treatment preventing the development of cardiovascular complications during and after the treatment of oncopathology. Currently, there are many studies described in foreign literature that have assessed the results of single-stage surgery in this category of patients - coronary artery bypass grafting (CABG) and surgical treatment of oncopathology. A two-stage approach is also used as an alternative to single-stage intervention. In connection with the spread of endovascular myocardial revascularization methods, the assessment of staged surgical treatment of patients who underwent coronary artery stenting before the start of oncopathology treatment is of great interest. However, at present, few studies have been conducted that have assessed the effectiveness of primary percutaneous coronary intervention (PCI) in patients with oncopathology, and the data obtained are quite contradictory. A number of studies have assessed only the immediate results of two-stage treatment performed in patients with coronary artery disease and oncopathology. It should be taken into account that there have not yet been studies in this area on a sufficiently large number of patients to determine clear criteria by which it would be necessary to recommend performing angioplasty with stenting as the first stage in patients with coronary heart disease and oncopathology. Nevertheless, a number of studies have shown high efficiency of primary myocardial revascularization in this category of patients.

INTRODUCTION

Analysis of immediate and remote results of both one-stage and two-stage treatment of patients with coronary heart disease and oncopathology is given by Davydov M. I. et al. In this observation in the staged treatment group, endovascular myocardial revascularization was performed as the first stage in ten patients, with drug-eluting stents used in half of the cases and coronary artery bypass grafting in ten cases. In the single-stage treatment group, 13 patients underwent coronary artery bypass grafting and lung intervention. In the staged treatment group, significantly lower hospital mortality was noted (4.3%) compared to the single-stage treatment group (15.4%). Lower mortality in the staged treatment group was also noted in the remote observation periods - 22.7%

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versus 27.3% in the single-stage intervention group. Nevertheless, the choice between single-stage and staged surgical strategy in this category of patients is still debatable.

According to Wakonsh et al., primary PCI in 16 patients (all patients were implanted with non-drug-eluting stents) followed by lung resection for malignant neoplasm showed good immediate and remote results. With an average follow-up period of 30 days, none of the patients showed signs of myocardial ischemia, 5 (31%) patients died due to metastasis. Five-year survival was 53%. When stenting coronary arteries, there is a need to choose between drug-eluting stents and bare stents. The question of the possibility of safely discontinuing antiplatelet agents before the second stage - surgical treatment of oncopathology - is also ambiguous, which often requires an individual approach in each specific case, taking into account the risk of stent thrombosis/bleeding.

The use of chemotherapeutic drugs (cytostatics) can increase the time of stent endothelialization, which in some cases requires an extension of the duration of dual antiplatelet therapy in patients with previously implanted stents. In turn, many chemotherapeutic drugs, such as thalidomide, have increased thrombogenicity, which may also require a change in the regimen of taking antiplatelet drugs. The use of chemotherapeutic drugs that can cause thrombocytopenia can also create difficulties in the use of antiplatelet drugs. According to some authors, given the difficulties of using antiplatelet therapy in patients with oncopathology, stents with drug coating should be avoided, giving preference to stents without drug coating. Currently, a number of studies have traced the relationship between the high risk of developing cardiovascular complications in patients who have previously undergone treatment for oncopathology and who are in remission for this disease. The high incidence of cardiac complications in this category of patients is primarily associated with the cardiotoxic effects of radiation therapy, as well as with the side effects of many chemotherapeutic drugs. The effectiveness and safety of PCI in this category of patients is also ambiguous. Data from a number of studies emphasize both the safety and effectiveness of PCI and the increase in cardiovascular complications when using this method of myocardial revascularization in patients with oncopathology in the remission stage.

Objective of the Study

Analysis of immediate and mid-term results of endovascular treatment of coronary heart disease in patients with oncopathology.

Objectives of the Study

To study the results of two-stage treatment of patients with coronary heart disease and oncopathology, where the first stage included endovascular myocardial revascularization, and the second stage included treatment of oncopathology. To analyze the results of PCI in patients with oncopathology in the remission stage. To assess the quality of life of patients in the mid-term periods after PCI.

Results of the Study

In this regard, this work is of great interest and has important practical significance for assessing the effectiveness of endovascular revascularization in this category of patients. The results obtained will allow us to give more precise recommendations for the use of percutaneous coronary

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intervention in patients with coronary heart disease and oncopathology. Coronary heart disease and oncological diseases occupy leading positions in the cause of death worldwide. The main cause of death from diseases of the circulatory system is still coronary heart disease. According to the demographic electronic journal (Demoscope Weekly), coronary heart disease is the cause of death of more than half of those who died from diseases of the circulatory system (in the Russian Federation 53.1% in 2012, or 29.2% of the total number of deaths). The second place among the causes of death is occupied by neoplasms (mainly malignant). Thus, in 2012, malignant neoplasms caused death in 15% of those who died. In recent years, the proportion of deaths from neoplasms has been growing, which is quite consistent with the trend of population aging.

The actual prevalence of the combination of these diseases remains unknown to date, but a number of authors have noted that patients with oncological disease have a high probability of having coronary heart disease. According to Reicher-Reiss H., the combined manifestation of coronary heart disease and malignant neoplasms in the male population is about 6.9%, and according to Mishra PK, the combination of cardiovascular pathology and oncopathology reaches 25.4%. According to Annie On Chan, the prevalence of rectal cancer in patients with coronary heart disease was significantly higher compared to the general population and patients without coronary heart disease. At the same time, smoking and metabolic syndrome were independent risk factors for the combined manifestation of late-stage rectal cancer and coronary heart disease. There are observations proving that patients with oncopathology have an increased risk of developing coronary heart disease. For example, it was shown that in patients with newly diagnosed malignant disease, the frequency of hospitalizations with newly diagnosed coronary heart disease is higher, especially in the first 6 months. These data were obtained in patients with malignant tumors of the lungs, small intestine, kidneys, liver and leukemia, as well as in patients with oncopathology and the presence of metastases. Oncological diseases, especially at a late stage, are often associated with increased platelet activity, which is an unfavorable factor in the development of thrombotic complications. Hypercoagulation is also characteristic of patients with oncopathology.

These observations confirm the hypothesis of a high probability of aggravation of the atherosclerotic process in patients with oncopathology against the background of existing coronary heart disease. Increased interest in patients with ischemic heart disease and oncopathology is due not only to the social significance and prevalence of these diseases, but also to a possible pathogenetic connection between them. The pathogenetic mechanisms of the relationship between these two pathological processes remain unexplored to the end, but today there are a number of observations aimed at studying this issue. Thus, there is an assumption about the presence of a connecting pathogenetic link - apoptosis, as well as changes in the rheological properties of the blood, underlying the pathogenetic chain. Hansen ES believed that the pathogenetic link combining malignant neoplasms and atherosclerosis is based on somatic mutations that occur under the influence of certain environmental factors, such as, for example, ionizing radiation. Inflammation is also an important link in the pathogenesis and progression of atherosclerosis and the oncological process. The existence of common risk factors also indicates the presence of a pathogenetic link. Thus, according to some authors, a connection can be traced between obesity and the risk of developing both cardiovascular and oncological diseases.

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The development and progression of ischemic heart disease can be facilitated not only by the oncological disease itself, but also by its therapy (including chemotherapy and radiation therapy). According to most authors, the incidence of post-radiation arteriopathy is about 5% of the number of people who received radiation therapy, but in certain groups of patients it may be higher. Thus, according to Oshibi T., radiation therapy at a dose of 40 Gy causes ischemic heart disease in 5-10% of cases.

Asymptomatic course of ischemic heart disease is also typical for radiation injury. In his study, MagkB Ь. V. noted that myocardial perfusion disorder in asymptomatic patients was detected in 27% of cases 6 months after radiation therapy for breast cancer. At the same time, a gradual increase in the number of patients with myocardial perfusion disorder to 42% by two years was noted. It is known that radiographic procedures can also contribute to the development of oncological diseases. According to S. Ooema, the risk of developing oncological diseases, primarily lung cancer, increases after percutaneous coronary intervention for chronic occlusions of the coronary arteries, especially in young patients (45-49 years old).

High cardiotoxicity of some chemotherapeutic drugs, especially in high doses, has been demonstrated in a number of studies, with a possible scenario of development of both heart failure/left ventricular dysfunction and myocardial ischemia, and thromboembolic complications caused by venous thromboses. In turn, there is an assumption that the use of drugs such as diuretics in cardiology practice can increase the risk of developing cancer - data were obtained on the effect of diuretics on the development of renal carcinoma in women. The history of the development of cardiac surgery in patients with coronary heart disease and oncopathology dates back to the second half of the 20th century. For the first time, data on a successful one-stage coronary artery bypass grafting and lung resection for adenocarcinoma were published by Dalton M. in 1978. To date, many studies have been described in foreign literature assessing the results of one-stage surgery in this category of patients.

The issue of performing operations with artificial circulation (AC) in this category of patients still remains unresolved. On the one hand, AC can suppress the immune function and lead to systemic seeding of malignant cells. On the other hand, artificial circulation can affect the activity of neutrophils and platelets and lead to activation of the complement system, which can have a preventive effect in patients with neoplasms. Thus, the results of coronary artery bypass grafting using artificial circulation in patients with one-stage lung resection for malignant neoplasm after one year and five years were comparable with the results of coronary artery bypass grafting with artificial circulation in patients with a benign tumor. Similar survival rates were also obtained when comparing the results of CABG using AC in patients with cancer in remission and in patients without oncopathology.

Of interest is the study by Yamatolo S. et al., in which serum samples from patients who underwent coronary artery bypass grafting with and without artificial circulation (11 patients) were added to a culture of cancer cells in vitro. Blood serum taken immediately after CABG without the use of CPB had a significantly greater inhibitory effect on cancer cells than the serum of the control group (after surgery with artificial circulation). At the same time, all serum samples taken immediately after surgery had a lesser inhibitory effect on the cellular proliferation of malignant cells than serum samples taken before surgery.

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However, in a number of studies evaluating the results of coronary artery bypass grafting using artificial circulation compared to revascularization on the beating heart in patients with oncopathology, no significant differences in the effectiveness of both methods were obtained. At present, this category of patients still chooses a minimally invasive strategy - coronary artery bypass grafting on the beating heart (off-pump), which determines this method as the leading one. Most of the results obtained in the simultaneous surgical treatment of coronary heart disease and oncopathology are presented mainly by this method.

Good results of off-pump surgery with simultaneous intervention on the lung for oncopathology were also demonstrated in patients with unstable ischemic heart disease.

A two-stage approach, where coronary artery bypass grafting is performed as the first stage, and oncopathology treatment is the second, is also used as an alternative to a single-stage intervention. Voets AJ's study compared one- and two-stage approaches in the treatment of patients with stage 1-2 malignant lung disease and obtained comparable results, but both groups had a small number of patients - 24 and 10 people, respectively. According to Miller DL, coronary artery bypass grafting performed as the first stage, followed by lung resection in patients with oncopathology has advantages over a one-stage treatment. Remote survival was significantly higher in the two-stage treatment group, but this only applied to patients with early stages of oncopathology; in other cases, the results were not statistically different.

The results of surgical treatment of coronary heart disease in patients with oncopathology in the remission stage deserve special attention. The study CarraBeat V. et al. included patients with both an active tumor process (group "A") and oncopathology in the remission stage (group "B"), as well as patients without concomitant oncopathology (group "C"). All groups were selected from 2146 patients who underwent surgery under artificial circulation. No significant differences in hospital mortality were obtained between groups "B" and "C", and no reliable difference in the frequency of postoperative complications was obtained between these groups. However, a significant difference in the causes of mortality from oncopathology and from cardiovascular complications was revealed between groups "A" and "C": 77.7% of deaths from oncopathology and 8.3% from cardiac complications in group "A", while in group "C" these figures were 2.2 and 71.4%, respectively. At the same time, no reliable difference was noted in the causes of mortality between group "B" (patients with oncopathology in the remission stage) and the control group - group "C". However, the study by Mibbiaen P. et al., which assessed the results of cardiac surgery for coronary heart disease or valve pathology, showed a significantly higher mortality both in the early and late periods in patients with oncopathology in the remission stage compared to the group of patients without oncopathology. At the same time, mortality from oncopathology increased significantly, especially in the period up to two years after surgery.

Despite the widespread introduction of cardiac surgery and interventional techniques in the treatment of coronary heart disease, there are still debatable issues regarding the tactics of surgical treatment in patients with coronary heart disease and oncopathology, determining the optimal strategy for managing these patients - sequential or one-stage, as well as the method of myocardial revascularization. Situations are still common when patients with three-vessel coronary artery disease (with stenosis of more than 75%) are denied surgical treatment of oncopathology. On the

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other hand, the presence of oncological disease is often a contraindication to operations with artificial circulation due to the risk of generalization of the oncological process.

In the American guidelines for myocardial revascularization (2007), in patients with non-cardiac pathology, myocardial revascularization is absolutely indicated in the presence of three-vessel coronary artery disease, significant stenosis of the left coronary artery, two-vessel disease with significant stenosis of the proximal third of the anterior descending artery and a reduced left ventricular ejection fraction or stress-induced ischemia according to non-invasive tests, as well as a high risk of unstable angina.

Conclusions

1. The obtained results confirm the high efficiency of endovascular myocardial revascularization in this category of patients and allow this technique to be widely used in clinical practice.
2. Recommendations have been developed aimed at optimizing the treatment strategy for patients with coronary heart disease and concomitant oncopathology.

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