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Особенности ведения пациента старческого возраста с пороком клапана сердца

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В статье на примере клинического случая разобрана тактика ведения пожилого коморбидного пациента с аортальным стенозом. Показана значимость междисциплинарного подхода в лечении подобных пациентов в соответствии с современными принципами гериатрии. Больные пожилого возраста нередко имеют сочетанную патологию, в частности болезни клапанов сердца, способные стать одной из значимых причин снижения функциональной активности и качества жизни пожилого человека. В то же время резервные функции организма некоторых пациентов очень велики. Это необходимо учитывать при выборе тактики лечения.

Ключевые слова: пожилой пациент; аортальный стеноз; комплексная гериатрическая оценка; качество жизни.

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ЭКО•ВЕКТОР

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Issues of the management of geriatric patients with valvular heart disease

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The present article describes a clinical case as an example of compiled treatment of a geriatric comorbid patient with aortic stenosis. The case mentioned in this article enhances and underlines the meaning of multidisciplinary approach in the treatment of such patients according to the contemporary and actual standpoints of geriatrics. Elderly patients are often reported to have comorbidities including valvular heart diseases which might be regarded as one of the most significant reasons for functional activity decrease and lower quality of life. Meanwhile, it is necessary to admit that functional resources of some patients are very high. It must be taken into consideration when choosing the disease management.

Keywords: elderly patient; aortic stenosis; comprehensive geriatric assessment; quality of life.

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ECO•VECTOR

BACKGROUND

Aortic stenosis is the most common valvular heart disease in adults. It is characterized by inflammation, remodeling, and calcification of the extracellular matrix, which cause valvular narrowing and outflow tract obstruction [1]. The main clinical manifestations of aortic stenosis are dyspnea, exertional angina, dizziness, and syncope. These conditions are often exacerbated by atrial fibrillation. This is fatal because the symptoms of aortic stenosis in older patients are difficult to interpret especially in the presence of coronary heart disease, neurological conditions accompanied by dizziness, and a sedentary lifestyle [2].

In patients aged >65 years, the incidence rates of severe, moderate, and mild aortic stenosis are 2%, 5%, and 9%, respectively [3]. Aortic stenosis is also predominant in women aged >80 years [4].

Selecting the management approach for an older patient with valvular heart disease is a difficult task and requires an integrated approach and the participation of a multidisciplinary team of specialists. Such an approach should include an assessment of the general condition of the body, identification of concomitant diseases, comprehensive geriatric assessment, and determination of life expectancy without considering lesions of the valvular heart apparatus [2].

Currently, the most effective treatment for aortic stenosis is surgery. Three types of interventions can be employed, namely, surgical aortic valve replacement, catheter balloon aortic valvuloplasty, and transcatheter aortic valve implantation (TAVI).

According to the clinical guidelines of the European Society of Cardiology (ESC) and the European Association for Cardio Thoracic Surgery (EACTS), surgical aortic valve replacement is the intervention of choice in patients aged <75 years with low surgical risk in the absence of senile frailty, aortic aneurysm, endocarditis, and thrombus in the aorta or left ventricle [4]. In older patients, this type of intervention is associated with the risk of atrial fibrillation, severe bleeding, pulmonary complications, acute renal failure, and cognitive impairment due to prolonged anesthetic support through a transthoracic approach [5, 6].

Catheter balloon aortic valvuloplasty is currently being considered a diagnostic method in patients with severe aortic stenosis and an intermediate treatment step before surgical aortic valve replacement or TAVI in patients who are hemodynamically unstable or in those who are symptomatic and have severe aortic stenosis requiring emergency extracardiac surgery [2].

According to the ESC and EACTS, in older patients, the mortality rate after balloon aortic valvulotomy does not differ from the mortality rate in severe aortic stenosis with clinical manifestations without surgical intervention. A permissible alternative treatment option is transcatheter implantation of a biological valve because of the greater strength of the prosthesis and the short life expectancy of the patient. This intervention is indicated for people aged >75 years and patients with senile frailty, fragile aorta, and a high risk of surgical intervention [2]. In turn, this intervention is associated with a high risk of vascular complications, need for pacemaker implantation, and paravalvular regurgitation [5, 6].

Despite recent data favoring TAVI in older patients at high risk of surgery, especially those with transfemoral access, the choice between TAVI and aortic valve replacement surgery should be made by a panel of experts after a thorough and comprehensive examination of the patient and individual assessment of the risks and benefits [4].

CLINICAL CASE

Patient D (92 years old) applied to the Center for Family Medicine of the North-Western State Medical University named after I.I. Mechnikov with complaints of weakness and swelling of the lower legs in the evening, periodic palpitations, coughing, and shortness of breath at night. One week previously, she was discharged from the hospital where she was treated for recurrent myocardial infarction for 10 days.

Medical history

The patient was hospitalized with a retrosternal pain attack. Coronary angiography and balloon angioplasty with stenting of the right interventricular artery were performed in 2021. The diagnosis of myocardial infarction was also confirmed by the level of troponin and changes in the electrocardiogram. During treatment in the hospital, the patient experienced a pulmonary embolism in the upper lobe of the left lung, followed by infarction pneumonia in the upper lobe of the left lung. The patient was discharged and transferred for outpatient treatment with a recommendation to use triple antiplatelet therapy. After the discharge, heart failure symptoms began to worsen.

Anamnesis vitae

More than 20 years before the presentation, the patient was diagnosed with stage III arterial hypertension, with a grade 4 risk of cardiovascular complications (very high).

The diagnosis of coronary heart disease and grade III exertional angina was established in 2001. The patient had four myocardial infarctions, with the last one in 2021.

Atherosclerosis of the aorta and coronary arteries and dyslipidemia were diagnosed and confirmed by laboratory tests.

In 2007, at age 77 years, the patient was diagnosed with aortic and mitral valve calcification combined with heart

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diseases, such as severe aortic valve stenosis, grade II aortic insufficiency, mild mitral valve stenosis, and grade II–III mitral insufficiency. The disease was slowly progressing. Surgery was repeatedly offered to the patient, but she refused surgical intervention.

In 2002, the patient was diagnosed with chronic viral hepatitis C. She did not take antiviral therapy.

Since 2010, she has had stage 3B chronic kidney disease (CKD). Currently, her glomerular filtration rates are 32 mL/min/1.73 m^2 (according to the Chronic Kidney Disease Epidemiology Collaboration formula [CKD-EPI]) and 36 mL/min/1.73 m^2 (according to the formula of the Modification of Diet in Renal Disease Study [MDRD]).

Since 2012, the patient has had cataracts and open-angle glaucoma. The lens was replaced on the left in 2015. The visual acuity of the left eye is 0.4 and that of the right eye is 0.

In 1970, she underwent a radical mastectomy due to a malignant neoplasm of the breast on the left. No relapses occurred.

Social history

The patient lives with her younger sister, who helps her with all household chores. Her husband died a long time ago. She has no children and was never pregnant. She lived in Novosibirsk and moved to St. Petersburg about 20 years ago. She is a retired teacher.

Physical findings

The patient stood 154 cm tall and weighed 45 kg. Over the past 10 months, she lost 17% of her body weight. Her body mass index was 18.97 kg/m^2, which is low for an older person. Her blood pressure and body temperature were 130/60 mm Hg and 36.0 °C, respectively. Her pulse rate was 80 per minute, regular, and symmetrical. She had rasping systolic murmur and diastolic murmur in the projection of the aortic valves and mitral valve, respectively. In the lungs, minor moist rales were heard in the lower segments. The edema of the lower extremities extended to 2/3 of the lower leg.

Comprehensive geriatric assessment

Since the patient was discharged from the hospital, a comprehensive geriatric examination was indicated for her.

According to the questionnaire "Age is not a problem," the indicator was 4 points, which points to the presence of preasthenia. The assessment of this indicator is very important because, according to clinical guidelines for the perioperative management of older patients, frailty more than doubles the relative risk of morbidity and mortality in all cardiovascular diseases and surgical and endovascular interventions [7].

Her Barthel index was 65 points, which means moderate dependence on external assistance. The score on the Instrumental Activities of Daily Living scale was 15 points, which indicates the presence of restrictions; specifically, the patient could not move outside her apartment, temporarily did not pay her bills, did not perform house chores, and did not cook her food. The patient completed the Get Up and Go Test in 15 s, which demonstrates a high risk of falls. Her Mini Nutritional Assessment score was 19.5, which indicates he risk of malnutrition. Mild cognitive impairment was determined by the brief mental status assessment scale. The patient had decreased vision and can barely see in her right eye.

Thus, the patient was diagnosed with geriatric conditions, namely, malnutrition, high risk of falls, and sensory impairments, namely, decreased vision, mild cognitive impairment, polypragmasy (intake of >5 drugs), and preasthenia.

To adjust the therapy and principles of management of a polymorbid patient with several geriatric conditions, not only establishing a diagnosis but also determining priorities in the follow-up is necessary.

Diagnosis

Predominant diagnosis. The patient had coronary heart disease, myocardial infarction of the lower wall of the left ventricle in the subacute stage, postinfarction cardiosclerosis, three episodes of myocardial infarctions (1993, 1999, and 2011), coronary angiography and balloon angioplasty with stenting of the right interventricular artery (2021), thromboembolism of the pulmonary artery in the upper lobe of the left lung in the subacute stage and infarction pneumonia in the upper lobe of the left lung, combined aortic defect (severe aortic valve stenosis and degree II aortic insufficiency), combined mitral defect (degree I mitral stenosis and degree II mitral insufficiency), atherosclerosis of the aorta, degree III decompensated congestive heart failure (grade III), stage III hypertension, and grade 4 risk of cardiovascular complications (very high).

Concomitant diagnosis. The patient also had stage 3B CKD, glomerular filtration rate of 32 mL/min/1.73 m^2 (according to the CKD-EPI formula) and 36 mL/min/1.73 m^2 (according to the MDRD formula), open-angle glaucoma in both eyes, condition after the lens replacement on the left (2015), chronic viral hepatitis C (inactive stage), malignant neoplasm of the breast on the left, condition after radical mastectomy (1970), and dyslipidemia.

Thus, the priority diagnosis at the moment is decompensated heart failure. Among geriatric conditions, malnutrition and polypragmasy are the most important. Decompensation of heart failure is caused both by myocardial infarction and pulmonary embolism and by progressive aortic stenosis.

ASPECTS OF THE AORTIC STENOSIS COURSE

In connection with the long-term (>15 years from the diagnosis establishment) valvular disease, the dynamics of its progression should be analyzed. In this patient, aortic valve stenosis was diagnosed in 2007. Surgical treatment had been repeatedly offered to the patient, but she refused. Echocardiography data (Table) revealed that the area of the aortic foramen naturally decreased over time, and in 2015, it was already 0.5 cm^2. The critical value of the aortic foramen area is less than 0.8 cm^2. The pressure gradient increased, and according to the latest data, it was 60 mm Hg in 2021. The ejection fraction decreased, and in the last 3 years, it was 55%. In 2021, the blood flow velocity at the aortic valve was 4.58 m/s. According to the American Heart Association, an aortic foramen area of <1 cm^2 in patients with symptoms and severe aortic stenosis or a peak aortic valve flow velocity of ⩾4.0 m/s is an indication for surgical intervention [8].

CHOICE OF APPROACH

Surgery is the only effective treatment for heart valve disease. The treatment of older patients with aortic stenosis is similar to that of patients of other age groups; however, for its implementation, the (1) presence of concomitant diseases, (2) data from a comprehensive geriatric assessment, and (3) life expectancy must be taken into account.

A comprehensive geriatric assessment of the patient revealed several geriatric conditions that can complicate the surgical treatment and postoperative period, but they can be corrected to improve the prognosis of recovery after surgery. Based on the data obtained, four main problems with the necessity of correction and evaluation before deciding on surgical treatment were identified, namely, (1) malnutrition, (2) polypragmasy, (3) decreased physical functioning, and (4) reduced mobility.

Malnutrition is an important factor because it directly affects tissue repair, pressure ulcer risk, and survival rates. In accordance with the clinical guidelines for malnutrition, evidence reveals better survival in patients with a body mass index of 27–30 kg/m^2 [9]. Malnutrition is amenable to successful therapy with the selection of a fortified diet and specialized enteral nutrition products. Since the patient has CKD, supplements indicated for this pathology can be recommended to the patient, for example, Nutricomp Drink Renal.

Polypragmasy. A discussion of drug therapy before surgery is necessary to assess possible intra- and postoperative risks and correct the surgical aids. Accordingly, the use of the STOPP/START criteria is recommended. Statins for the secondary prevention of cardiovascular complications were prescribed to the patient (since she had four episodes of myocardial infarctions). In the anamnesis, the patient noted episodes of muscle pain associated with statin intake. Since evidence reveals the presence of muscle symptoms and cognitive impairment associated with statin intake, a geriatrician consultation is required to select the dose of drugs and assess the harm–benefit ratio [10]. According to the Expert Consensus of the Russian Association of Gerontologists and Geriatricians, the correct prescription of statin therapy requires the assessment of life expectancy, which was 2.62 years in the patient [10]. This is because the expected effect of statins is realized only after 3 years of therapy, and the harm from their use manifests itself much earlier [10]. As a result of the analysis of all the arguments, statin therapy was prescribed.

Triple antithrombotic therapy was prescribed to the patient because of the presence of subacute myocardial infarction and pulmonary embolism. For dose selection, the risk of hemorrhage must be assessed, which scored 4 points (high) on the HAS-BLED scale. A decrease in glomerular filtration rate requires dose adjustment of anticoagulants. Thus, any antithrombotic drug should be used cautiously [11].

Table. Dynamics of progression of aortic stenosis in a 92-year-old patient
Таблица. Динамика прогрессирования порока у пациентки 92 лет

Parameter	2007	2008	2009	2011 July	2011 November	2012 January	2012 September	2015 January	2015 April	2021
Aortic foramen area, cm^2	1.0	n/a	0.92	n/a	n/a	n/a	0.8	0.5	n/a	n/a
Pressure gradient, mm Hg	n/a	n/a	n/a	26.6	29	27.9	47	63	56	60
Left atrium size, mm	3.9	3.8	3.2	3.6	37	38	36	58	59	42
Ejection fraction, %	77	62	63	62	50	65	62	55	50	55
Blood flow velocity at the aortic valve, m/s	n/a	2.1	2.06	2.58	3.3	2.64	3.43	3.98	3.75	4.58

Note. n/a, no data available.

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The sensory and mobility disorders identified during a comprehensive geriatric assessment increase the risk of delirium and falls and dependence on external assistance, which must be taken into account when planning surgery and predicting recovery after surgery.

Thus, despite the serious condition, the patient had no contraindications to the surgical correction of valvular disease. Existing geriatric syndromes should be considered before planning the surgery because their presence will affect the choice of the correction method. Most of them can be adjusted. However, the patient's consent to surgical treatment remains a priority. Unfortunately, consent was not obtained in this case. This factor should also be considered in geriatric practice. Anxiety and fear of medical manipulations are a common reason for refusing effective treatment. In this case, the maintenance of an optimal quality of life against worsening heart failure and selection of drugs are necessary for its elimination.

DISCUSSION

Despite the pronounced comorbid status and severe course of aortic stenosis, the possible causes of the patient's longevity remain unknown. However, the ongoing study "Crystal" has revealed that an adequate level of nutrition, preserved cognitive status, and independence in everyday life contribute to an increase in the life expectancy of an older person [12, 13]. Moreover, some factors are known to complicate greatly the disease course and lead to a decrease in life expectancy. The most significant are diabetes mellitus and depression.

Diabetes mellitus leads to an increased risk of progression of geriatric disorders such as cognitive dysfunction, falls, pain, depression, polypragmasy, sarcopenia, and urinary incontinence [14]. It contributes significantly to the occurrence of fatal events (myocardial infarction and cerebral stroke) due to an increased risk of hypoglycemic conditions and vascular damage in older patients with diabetes mellitus because of long-term hyperglycemia [15].

In numerous studies, factors such as depression are associated with a significant increase in overall mortality. An 8-year prospective follow-up study by general practitioners in the UK of older patients with depression showed that depression increased the mortality rate by three times in those with comorbid somatic pathology [16]. According to a cohort study, the most common cause of death in these patients was coronary heart disease [17].

Patient D. did not have depression and diabetes, but had a favorable social position, namely, a loving sister and financial stability.

CONCLUSION

The clinical case described illustrates the hypothesis about the reserves of individual viability in older people, which allow them to live long even with severe incurable diseases. Presumably, the main positive factors that allowed patient D. to have a long-liver age are the absence of depression, good cognitive status, and absence of diabetes.

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Authors contribution. *E.V. Frolova* performed the analysis of literary sources, wrote the text, and edited the article; *O.Yu. Pankratova* collected and analyzed the clinical data, collected the literary sources, and prepared and wrote the text of the article.

All authors made a significant contribution to the article preparation, read and approved the final version before its publication.

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