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Coronary stent migration into the aorta during implantation in the orifice of the right coronary artery and its elimination: Review with a clinical case

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The purpose of this study was to analyse a vivid clinical case of problematic stent extraction that migrated during coronary stenting.

Materials and methods. The following clinical methods of research were used: general laboratory and instrumental, which were applied in interventional cardiology.

Results and discussion. A patient born in 1950 with pronounced symptoms of cardiac pathology was admitted to the cardiology department. The diagnosis of coronary heart disease in the form of class III of angina pectoris was established. Coronary angiography was recommended to the patient, where 3 vascular lesions of the coronary arteries were detected, coronary artery bypass grafting was recommended, which the patient flatly refused. Coronary stenting was performed 2 days later, but a complication occurred during the intervention – stent dislocation and migration during implantation into the mouth of the right coronary artery, which occurred during endovascular interventions for myocardial revascularisation in coronary heart disease. The causes of such complications have been identified, and the endovascular methods used in their treatment have been described. Several attempts have been made to extract the migrated stent, but the first of them were unsuccessful. Only after 5 attempts to remove the migrated stent using the ONE SNARE endovascular trap was success achieved.

Conclusions. The article provides a comprehensive analysis of the problem of stent migration in various vascular systems and organs, emphasizing the seriousness and complexity of this phenomenon. It demonstrates the importance of timely diagnosis and discusses treatment approaches that can reduce the risk of complications and improve patient outcomes.

Key words: atrium, restenosis, bypass surgery, vessels, left ventricle, right ventricle, arterial hypertension.

Percutaneous methods of treating coronary artery disease have greatly improved over the years, offering varied and effective solutions. This subject is highly relevant due to the significant risks of severe complications associated with surgical interventions on blood vessels. A critical issue is the complication of stent migration, which poses challenges in managing coronary artery ischemia and extracting the

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stent. According to N. Suraci et al. [1], such complications are relatively common, and it is crucial to address them accurately. Their study emphasizes the importance of proper removal and fixation of the stent in the superior vena cava to prevent migration and ensure effective treatment.

S. Verhemel et al. [2] provided clinical data on the combination of migration of the coronary stent and the occurrence of obstruction of blood outflow through the left ventricle. This case presents difficulties in the form of relocation of the structure, and the planned installation of the aortic heart valve. It is noted that such conditions are often combined in elderly and senile patients, considering age-related changes and concomitant pathology. Therefore, it is necessary to consider that such a layer of the population suffers from several concomitant pathologies due to the depletion of the compensatory capabilities of the organism. More than 70-75 % of such persons are disabled precisely as a result of complications in the cardiovascular system, for example, arterial hypertension, arterial or venous thrombosis, and other pathologies. In addition, Z. Aidarov et al. [3] indicated the detrimental effect of complications of cardiovascular diseases on the development of pathologies from other organs, as an example – in the structure of renal failure. Typically, along with coronary heart disease, formidable diseases such as diabetes mellitus also follow. According to L. Nikitenko et al. [4], men and women with diabetes are 2-3 times more likely to suffer from thrombosis and are also significantly more likely to undergo vascular surgery due to heart disease.

In their research, Q. de Roux et al. [5], L. Yang, and X. Qiu [6] argue that medical specialists resort to interventional treatment methods in complex forms of coronary artery disease and its associated pathology. One of these methods is the installation of a coronary stent and balloon angioplasty. Indications for the use of transluminal balloon angioplasty and stenting in more complex patients, who were recently considered inoperable in terms of both the technical capabilities of the intervention and the high risk of complications, are expanding every year. In particular, coronary stenting has proven to be an effective treatment method even at critical levels of ischaemia. B. Nurgalieva et al. [7] indicate that the development of new tools and technologies expands the horizons of performing such operations, in particular, with pronounced calcification of the coronary arteries, significant thrombosis, vascular tortuosity, and inconvenient geometry of the take-off angles.

H. Luo et al. [8] and Y. Zhang et al. [9] note that the distinctive features are characterised by stenting of the renal arteries. As a result of this procedure, the migration of the stent into both the renal artery and the heart was demonstrated. The disadvantage was successfully eliminated with the help of the latest special devices in the form of cylinders. However, on the other hand, the use of new technologies is associated with increased risk and still does not provide a complete guarantee of complications during operations. This type of complication includes migration or dislocation of the stent. Such complications develop rarely <0.5 %. Coronary stent embolism usually occurs due to tortuosity of the proximal sections, rigidity and calcification of the proximal segment, insufficient pre-dilation of the balloon catheter of the target lesion, during stent advancement during an attempt of direct stenting without pre-dilation and stent implantation in oral lesions during removal.

Given the above-mentioned features of stenting, the problematic issue of stent migration into the vessels arises, and the issue of removing the migrated stent is of the highest priority. Several methods for extracting displaced stents and other external bodies have a high success rate [10], but all of them are time-consuming and can affect patients in a hemodynamically unstable state. And it can lead to potential consequences such as dissection, perforation, arterial thrombosis, myocardial infarction, cerebral artery embolism, and death. Thus, considering scientific data, a number of important issues remain unexplored, namely: the causes of migration, the elimination of this complication, the tactics of extracting a migrated stent in concomitant pathology, and the development of safe and effective methods of stent elimination.

The presented clinical case of coronary stent placement and its migration describes the prerequisites for the migration of a coronary stent. It characterises the extraction methods of this structure, which are used in this case and proposed by other specialists.

MATERIALS AND METHODS

This paper presents a clinical case. The study was conducted at the Cardiocentre Clinic. To make the primary diagnosis and establish the concomitant pathology of the patient, a general blood test, a general urine test, a biochemical blood test with a lipidogram and liver samples, an angiographic examination of blood vessels, Holter heart monitoring, an electrocardiogram, an echocardiogram were performed. The method of

coronary stenting was used for therapeutic tactics. In addition, an objective examination of the patient with the highlighted diagnosis, auscultation at all points, percussion and palpation of the cardiac area were performed. According to all the mentioned examination methods, the established diagnosis was confirmed.

Seldinger central venous access was used to obtain safe access to the vessels [11–13]. First, one of the central arteries was punctured with a puncture needle. A flexible conductor was inserted into the needle, which moved further along the vessel. Next, the needle was removed and a special vascular stent was placed on the conductor in the area of the affected coronary artery, and it was further advanced along the vessel and the conductor was removed. After advancing the stent in a folded form (metal stent or from modern biomaterial treated with medical substances), it was spread in the vascular bed and fixed, it was this manoeuvre that would prevent the stent from relocation.

Modern scientific medical literature on the subject was collected and analysed. The study used scientific literature from the USA, Canada, India, China, Korea, Turkey, Singapore, Vietnam, UAE, Germany, and Italy. For this purpose, scientometric databases such as Web of Science, Scopus, PubMed, and archives of scientific papers such as Google Scholar and Research Gate with a publication period from 2019 to 2023 were used. The principle of searching the literature on the topic was used without imposing any restrictions on the language. To search for scientific information, the following list of scientific names, terms, and phrases was used: "coronary heart disease", "myocardial infarction", "angina pectoris", "effort-induced angina pectoris", "treatment", "angiotic pain", "patients", "Rose questionnaire", "classification", "scale", "surgical intervention", "central venous access", "Seldinger technique", "coronary artery bypass grafting", "angiography", "coronary stenting", "complication", "stent migration", "relocation", "ischaemia", "thrombosis", "stenosis", "restenosis", "Halfen-Rose test".

RESULTS

Antihypertensive drugs were taken irregularly. Over the past two weeks, the patient experienced pressing chest pain with minor exertion, radiating to the left subscapular area, interscapular space, and left arm. The pain lasted several minutes and resolved on its own at rest without medication [14, 15]. The patient appeared pale, indicating reduced blood supply to internal tissues. This is linked to a sudden loss of physical activity and muscle mass, along with swelling in the face and lower extremities, suggesting cardiovascular issues and possible kidney problems. Fluid retention, likely from inflammatory and circulatory issues, may be the cause [16–18]. The patient also reported difficulty breathing, described as rapid, shallow breaths, leading to a bluish tint in the skin and mucous membranes [19]. Increased neck vein pulsation was noted, and the patient appeared exhausted even with minimal exertion. This severe impairment requires urgent medical intervention to diagnose and treat the underlying cause. Severe headaches and loss of consciousness during physical activity suggest serious complications requiring prompt and effective treatment. A thorough follow-up examination is essential to determine the underlying cause and prescribe appropriate treatment to improve the patient's condition [19–21].

The patient described a pressing headache in the temporal and occipital regions, occurring during elevated blood pressure, indicating a hypertensive crisis [22]. Associated symptoms like dizziness, nausea, and vomiting suggest a significant blood supply issue, particularly in the context of high blood pressure. Increased sweating, skin pallor, and cold sweat may also signal severe ischemia. This suggests that the body reacts to insufficient blood supply by activating compensatory mechanisms aimed at ensuring vital functions. Complaints of an increased heart rate or abnormal heart rhythm are also associated with ischaemia affecting the heart muscle (myocardium) and its work. The control and treatment of hypertension and ischaemia are important for managing the patient's condition and preventing further complications. This requires a comprehensive approach, including drug therapy, diet and lifestyle changes [23]. A detailed examination and consultation with a doctor are necessary for accurate diagnosis and proper treatment.

Echocardiographic examination revealed a decrease in ejection fraction to 35 %, indicating a significant impairment of left ventricular function. Ultrasound examination of the heart revealed signs of dilatation of the cardiac cavities, especially the left ventricle, and a decrease in its contractility. Segmental impairment of myocardial wall mobility was also detected, confirming the presence of ischemic zones.

Magnetic resonance imaging showed the presence of ischemic zones in the left ventricle, indicating reduced myocardial viability. The detected lesions are characteristic of chronic ischemia and may be associated with prolonged insufficient blood supply. Stress echocardiography confirmed these findings, showing significant areas of hypokinesia and a decrease in

regional myocardial contractility under load. These results indicate the presence of severe ischemic changes and the possible need for surgical intervention to restore normal blood circulation.

After the performed echocardiography, the patient with the above-mentioned complaints underwent coronary angiography on 24.05.2023. The procedure was performed under local anaesthesia with a 0.5 % – 5 ml novocaine solution (right radial artery puncture was performed using the Seldinger technique) [12]. A special conductor was installed, followed by alternate catheterisation of the left coronary artery (LCA) and right coronary artery (RCA) with JL 3.5 and JR 3.5 5F catheters. According to the results of the performed manipulation, the right type of coronary blood supply was noted. The trunk of the LCA is passable, contour irregularities were found at the beginning of the vessel, followed by irregularities throughout. The artery was significantly calcified, with stenosis in the proximal segment up to 80 %, stenosis in the middle section up to 60 %, stenosis in the distal segment up to 50 %, and stenosis at the origin of the diagonal artery up to 80 % (diameter of the artery ~2 mm). Envelope artery – contour irregularities throughout the entire length, stenosis in the middle segment up to 80 %, stenosis at the mouth of the branch of the blunt edge 1 up to 50 %, and stenosis in the proximal section up to 30 %, as well as stenosis in the proximal section of the branch of the blunt edge 2 up to 80 %. RCA – contour irregularities, calcified, stenosis in the proximal segment up to 75 %, occlusion in the middle segment, postocclusive sections contrast within and across intersystem collaterals *(Figure 1)*. Complications as a result of diagnostic manipulation were not observed.

Based on the data obtained, the doctor concluded that there was a three-vessel lesion of the coronary arteries. The patient was recommended to consult a cardiac surgeon. The patient categorically refused the recommended operation of coronary artery bypass grafting. The consultation decided to stent the AIA (anterior interventricular artery) and RCA. Thus, percutaneous intervention was performed on AIA and RCA on 27.05.2023. The course of the procedure was as follows: under local anaesthesia with a solution of novocaine 0.5 % – 5 ml, a puncture of the right radial artery was performed using the Seldinger technique. A special adapter was installed through which a JL 3.5–6f conductive catheter was inserted into the mouth of the RCA, a 0.014–185 cm coronary conductor was passed through the occlusion site into the distal sections of the RCA, a number of pre-dilations were made with a Maverick Monorail 1.5×15 m and Maverick Monorail

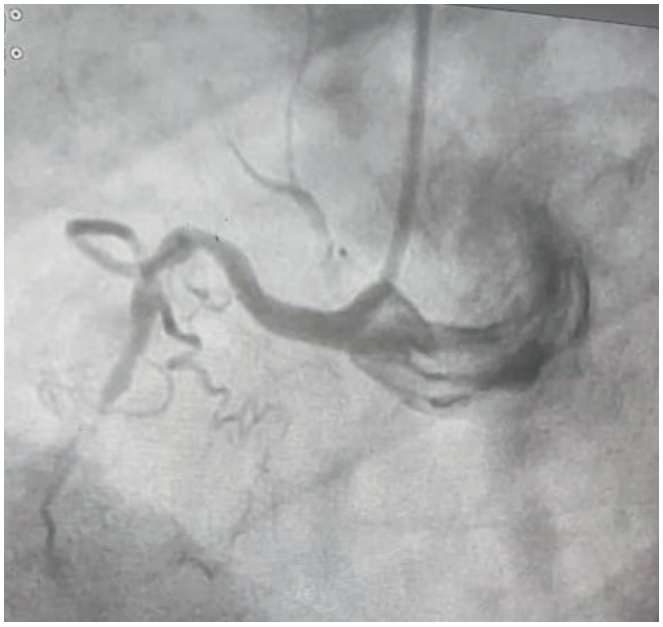

Figure 1. **Angiography of the RCA, where diffuse lesion and chronic occlusion in the middle segment of the artery were revealed.**
Source: compiled by the authors.

2.0×20 mm balloon catheter (time (T) – 10 s; atmospheric pressure (P) – 18 atm.), then drug-coated stents Promus Premier Select 2.50×24 mm (T – 10 s; P – 16 atm.) and Promus Premier Select 2.75×28 mm (T – 10 s; P – 18 atm.) were implanted.

The control angiography shows dissection in the proximal region, as a result, it was decided to implant a third Promus Premier Select 3×12 mm stent (T – 10 s; P – 16–20 atm.), the dislocation of part of the stent into the ascending aorta is visualised on a control angiography *(Figure 2)*.

There was a complication of dissection of the proximal part of the RCA, dislocation of the stent into the ascending aorta. It was decided to eliminate the dislocated stent using the ONE SNARE endovascular trap *(Figure 3)*. The migrated stent was successfully removed, then the Promus Primier Select 3.5×16 mm stDuring the control angiography, the stents were fully opened, the lumen of the artery was restored, and blood flow through the artery according to the coronary blood flow scale – TIMI III. Next, a JL 3.5–6f conductive catheter was installed at the mouth of the LCA trunk, a 0.014–185 cm coronary conductor was passed through stenoses into the distal parts of the anterior descending artery, pre-dilation was performed with a Maverick Monorail 1.5×15 balloon catheter (T – 10 s; P – 18 atm.), then a Promus Premier drug-coated

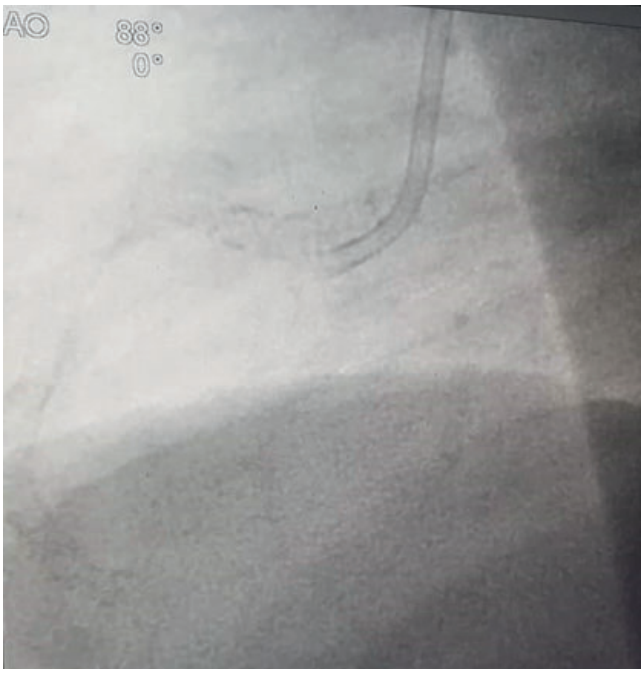

Figure 2. **Stent dislocation in the aorta.**
Source: compiled by the authors.

Figure 3. **Moment of extraction of the migrated stent**
Source: compiled by the authors.

stent Select 2.75×24 mm (T – 10 s; P – 14–16 atm.) was implanted *(Figure 4)*. On a control angiography, the stent is fully opened, the lumen of the artery is restored, and blood flow through the artery TIMI III.

After that, the final control echocardiography was performed. The results showed that the aorta is somewhat compacted, d=3.5 cm. Aortic valve: tricuspid, moderately thickened. The systolic pressure gradient is 7 mm Hg. Regurgitation was not detected. Mitral valve: mitral valve prolapse has been determined at a normal cm^2. The condition of the flaps is somewhat compacted, calcified. The diastolic pressure gradient – 7 mm Hg. Regurgitation is minimal. Tricuspid valve: the condition of the valves has not been changed, within the normal range. Diastolic pressure gradient is 2 mm Hg. Regurgitation is up to 1 degree. Pulmonary artery – the lumen is not dilated. The condition of the flaps has not been changed, within the normal range. Pressure gradient – 8 mm Hg. Regurgitation is minimal. Systolic blood pressure of the pulmonary artery is 29 mm Hg. The right atrium is not dilated. The right ventricle is 3 cm. The anterior wall of the right ventricle is 0.4 cm. The left atrium is 3.7 cm. Left ventricle: the final diastolic size of the left ventricle is 5 cm, the final systolic size is 3.8 cm, the posterior wall of the left ventricle is 1 cm, the interventricular septum is 1.1 cm, the ejection fraction is 50 % (according to L.E. Teichholz et al. [24]). Diastolic function of the left ventricle: impaired. Zones of hypokinesis: the middle posterior, middle lower and

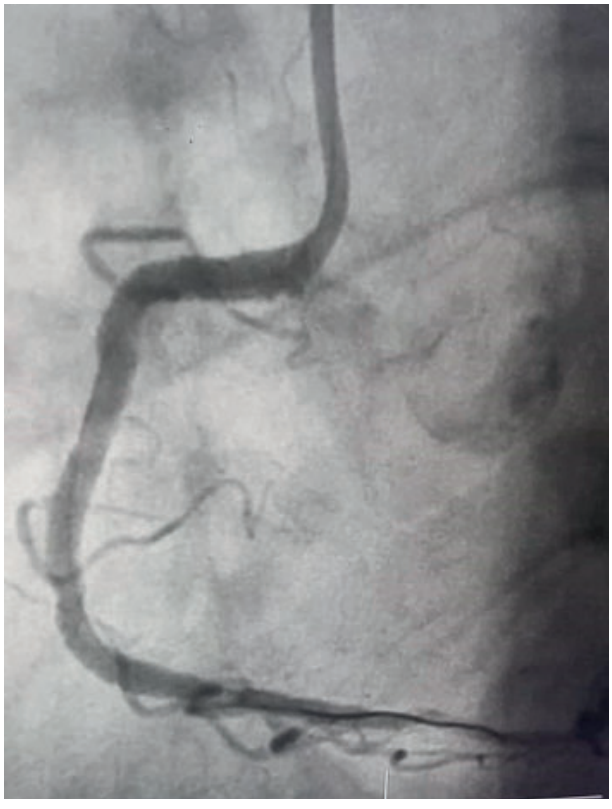

Figure 4. **Final angiography after implantation of all stents.**
Source: compiled by the authors.

middle lateral segments of the lower LV wall. The atrial septum is intact. The interventricular septum is intact. Based on these data, experts have developed a conclusion: sealing of the aortic sections. A moderate decrease in the local contractility of the LV wall. Diastolic dysfunction of LV. After the classical electrocardiogram: the rhythm is sinus, correct. The heart rate is 74 beats per 1 minute. Signs of scarring of the lower LV wall were revealed. After the described surgical intervention, the patient was temporarily assigned a bed regime in the intensive care unit. Referred for further diagnostics, cardiologist consultation and further treatment. The patient is classified as having class III of angina pectoris according to the Canadian Cardiovascular Society. This means that he experiences symptoms of angina with minimal physical activity, such as climbing stairs or walking on flat ground. Angina occurs even with moderate physical activity, which indicates a significant limitation of physical activity.

DISCUSSION

Migration of a coronary stent represents a potentially serious challenge in the treatment of cardiovascular diseases, especially when accompanied by pathological changes in the coronary arteries. There are a number of factors that can cause this undesirable phenomenon to occur [25, 26]. Angioplasty procedures aimed at vasodilation can affect the stability of the stent. To prevent such complications, it is important to comply with high standards of professional practice and use modern technologies and equipment. Further research and development of new treatment strategies also play a key role in minimising the risks of coronary stent migration and improving treatment outcomes for cardiovascular diseases [27]. If the walls of the blood vessels of the heart are weak or pathologically altered, stent fixation may be less effective. In addition, blood can clot around the stent and form pinches (blood clots), which leads to peeling of the stent. If the selected stent is too small for the vessel, it can easily move out of place. If the stent is placed in a place where the artery forms an acute angle, this may increase the risk of migration. Symptoms of stent migration very often include chest pain, deterioration of physical endurance, all manifestations of angina pectoris, and symptoms of myocardial infarction [28, 29]. In addition to invasive correction, auxiliary treatment of stent migration may include the use of anticoagulants. However, the main manipulations are performing procedures to remove blood clots or expand the stent, and in some cases there may be a question of the need for repeated angioplasty. Treatment is selected individually, depending on the symptoms and severity of the problem [30, 31].

The coronary stenting method is effective for treating coronary arteries but can lead to several complications [32]. These include restenosis, where arterial stenosis recurs due to cell or tissue deposition inside the stent. To prevent this, drugs like sirolimus or paclitaxel are used. Another complication is stent thrombosis, where blood clots form on the stent's surface, potentially causing myocardial infarction [33, 34]. To mitigate this, medications such as aspirin and anti-aggregation drugs are prescribed. Additionally, stent ejection, where the stent detaches from the vessel wall, and allergic reactions to the stent's coating or preservatives can occur. Infections during the procedure may also lead to complications, including stent ejection or vessel infections. Severe vascular damage during stenting can cause perforation and bleeding.

The problem of interventional treatment of heart disease was considered by E. Tsuda [35] and G. Yankov et al. [36]. The researchers explored issues related to stent migration and extraction, which are relevant to this study. Notably, authors' research involved a cohort of patients with Kawasaki disease to observe differences in stent displacement and complications. Their findings highlight the importance of addressing the challenges associated with stent migration and proper removal techniques. Thus, 33 people were implanted with a coronary stent for 34 arteries. Complications were revealed in 19 of the 28 control angiographs. That is, this result confirms the hypothesis put forward about frequent complications after coronary stenting. In 9 cases, complete occlusion was established, in 8 – restenosis, and in 2 cases – migration of the coronary stent occurred. After eliminating these shortcomings, the frequency of such complications after 1 and 3 years was 57 %.

In turn, P. Chakraborty et al. [37] and B. Chen et al. [38] independently describe a clinical case of coronary stent migration without visible symptoms. It should be noted that sudden perforation of the coronary artery and subsequent extraluminal migration of the stent is an extremely recoil-prone event. What is common with the described clinical case is that the coronary stenting method was used to treat coronary artery disease in both studies. What is distinctive is that the manipulation was performed for a complicated myocardial infarction and as a result, a side effect arose – stent migration. The researchers describe that the design penetrated into the false passage, after which it was possible to correct the setting, however, along

with the migration, a grade 2 coronary artery perforation took place. Next, the stent was re-implanted, but a year later, 100 % restenosis of this artery and 70 % obstruction of the proximal anterior descending artery were noted on coronary angiography. It is impossible to determine the exact cause of migration, but the likely mechanism is the establishment of an excessively rigid stent and tortuosity of the coronary vessels, and with normal haemodynamics these factors can have a significant impact on stent relocation. Based on the data obtained, coronary artery bypass grafting was recommended.

An absolutely distinctive clinical case was described by P.G. Haddad et al. [39] and S.C. Pokhriyal et al. [40]. It is indicated about a 34-year-old woman who has been diagnosed with May-Turner syndrome and required the installation of an intravenous stent that expands due to pathological narrowing of the heart veins. After stent placement, its migration to the right parts of the heart, namely the right atrium, was detected. To detect the exact location of the stent, an X-ray method was used, which showed the stent in a tricuspid valve. All endovascular stent extraction trials were unsuccessful. After that, an attempt was made to remove the stent using a wired guide, which was also unsuccessful. Next, the specialists resorted to the manoeuvre of removing the stent using a balloon, in the hope that the stent would get stuck between the balloon. However, this method did not help either. The use of a balloon and a special auxiliary strip and a trap shell has only become an effective method. Thus, by inflating the balloon inside and gradually slowly releasing the air, it became possible to first partially and then completely remove the stent into a special shell. Next, a control angiography was performed, according to the results of which it was found that the stent was completely intact.

Despite the above data on the significant incidence of stenting complications in the form of stent migration, contradictory information on this problem is found in the literature [41]. Thus, in the study by H. Paoli et al. [42], it is distinctive that the researchers describe not frequent, but sporadic cases of stent migration. It is indicated that every year there are fewer and fewer such complications, and this is due to the constant improvement and modification of stents. For comparison, 20 years ago migration occurred in 5 % of cases, and now only in 0.3 %. Moreover, studying this problem, A. Waack et al. [43] concluded that the moment of stent migration occurs before its deployment and all problems are associated with this moment. This is explained by the fact that when a stent is implanted into the arterial mesh, it fulfils and covers it and cannot migrate anymore.

A. Hossain et al. [44] describe an alternative method for determining stent localisation and migration – transthoracic echocardiography. Compared with the coronarography method described in this study, the above-mentioned method has its advantages associated with less invasiveness. However, it should be considered that coronary angiography is more a method of targeted visualisation of coronary vessels, rather than the state of the stent. Therefore, it is necessary to devote more time to the study of coronary angiography and echocardiography in the diagnosis of stent migration. According to J. Senior et al. [45], stent dislocation is observed in 1.3 % of cases. Calcification of the intimate vascular membrane and tortuosity of the coronary vessels exacerbate this problem. In contrast to the presented study, researchers describe the following methods of eliminating a migrating stent: use of a loop to grasp the stent and remove it; use of a special balloon inflated in the vessel lumen; special tools by means of forceps or other devices. Despite the variety of retrieval methods, it is common in the papers that the optimal method is endovascular stent retrieval. However, the researcher used modern medical devices to remove the migrating stent by placing it in a special sheath, as other previous methods were ineffective in this case.

In turn, in the clinical case of N. Awasthy et al. [46] describe an alternative to the above methods. In particular, a case of balloon stenting of the coronary arteries is presented, which ended with a complication – stent migration, but this problem was corrected with the help of a modern biotome. A number of researchers state that such complications of surgical interventions on the arteries of the heart can happen at any time: both during the procedure and several years after the operation [47, 48]. H. Goerne et al. [49] suggest that coronary stents are a modern medical asset, effective in the fight against myocardial infarction with or without ST segment elevation in patients with unstable ischaemic disease. However, preference should be given to self-expanding stents. Invasive coronary angiography should be recognised as the most modern and effective method of diagnosing the condition of small and large-calibre vessels, especially with regard to the problem of the need to install a stent due to pathological changes in vessels that oppose normal blood flow.

CONCLUSIONS

Thus, the migration of a coronary stent into the coronary vessels of the heart and other additional small and large vessels is a serious medical case that requires attention and problem solving. Technological innovations and the active role of patients can help prevent this complication and improve the results of intravascular interventions. Further research and collaboration between doctors and medical equipment manufacturers is an important step in improving the quality of life of patients with heart disease. Despite these potential complications, coronary stenting remains an effective method of treating pathological changes in the coronary arteries, and many patients report relief of their condition after this procedure. Doctors need to consider the risks and benefits before performing stenting, choosing the best treatment method for each patient. However, most specialists need to work on improving the skills of installing a stent, since a number of complications arise not only from technical design problems, but also from the inexperience of the doctor.

The problem of restenosis requires the introduction of special medications that prevent the growth of cells inside the vessel (endotheliocytes) to reduce the likelihood of this complication. The occurrence of thrombosis on the surface of the stent can lead to serious complications, and prevention of thrombosis is usually carried out with the help of drugs that reduce blood clotting – antiplatelet agents. However, one of the most serious problems in endovascular surgery remains the process of stent migration, which can occur due to the action of various factors, which can cause serious complications. This highlights the importance of precise insertion and fixation of the stent during the procedure. Some patients may have allergic reactions to the materials used in the manufacture of the stent, which requires consideration of the choice of material for the installation of the stent.

Thus, the topic under consideration is promising in further study due to the considerable choice of methods for eliminating stent relocation and the complexity of eliminating a migrated stent. Summarising the above–mentioned data, it can be noted that stenting is a unique method of correcting ischaemic changes in the area of coronary vessels, which has an effect of more than 80 %, however, additional improvements in the technical features of stents are needed, as well as the final development of methods for the extraction of migrated stents.

The authors declare no conflict of interest.

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Міграція коронарного стента в аорту під час імплантації в устя правої коронарної артерії та її усунення: огляд з клінічним випадком

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Мета – аналіз вираженого клінічного випадку проблемної екстракції стента, що мігрував під час коронарного стентування.

Матеріали і методи. Використано такі клінічні методи дослідження: загальнолабораторні та інструментальні, які застосовуються в інтервенційній кардіології.

Результати та обговорення. У кардіологічне відділення надійшов пацієнт 1950 року народження з вираженими симптомами серцевої патології. Діагностовано ішемічну хворобу серця, стенокардію напруження III функціонального класу. Пацієнту рекомендовано проведення коронарографії, під час якої було виявлено 3-судинне ураження коронарних артерій, рекомендовано аортокоронарне шунтування, від якого пацієнт категорично відмовився. Через 2 дні виконано коронарне стентування, але під час втручання виникло ускладнення – дислокація та міграція стента під час імплантації в устя правої коронарної артерії, що трапляється під час ендоваскулярних втручань з метою реваскуляризації міокарда при ішемічній хворобі серця. Визначено причини таких ускладнень та описано ендоваскулярні методи, що застосовуються для їх лікування. Було зроблено кілька спроб витягти стент, що мігрував, але перші з них були невдалими. Лише після 5 спроб видалення такого стента за допомогою ендоваскулярної пастки ONE SNARE було досягнуто успіху.

Висновки. У статті наведено комплексний аналіз проблеми міграції стентів у різних судинних системах і органах, що свідчить про серйозність і складність цього явища. Демонструється важливість своєчасної діагностики та обговорюються підходи до лікування, які можуть зменшити ризик ускладнень і покращити результати лікування пацієнтів.

Ключові слова: передсердя, рестеноз, шунтування, судини, лівий шлуночок, правий шлуночок, артеріальна гіпертензія.