

КЛИНИЧЕСКОЕ НАБЛЮДЕНИЕ ПАРОКСИЗМАЛЬНОЙ АТРИОВЕНТРИКУЛЯРНОЙ РЕЦИПРОКНОЙ ТАХИКАРДИИ ПРИ ИНТЕРМИТТИРУЮЩЕМ СИНДРОМЕ ВОЛЬФА-ПАРКИНСОНА-УАЙТА

© Н.П. Павлова, Н.М. Артемова, Е.А. Максимцева, О.М. Урясьев

ФГБОУ ВО Рязанский государственный медицинский университет
им. акад. И.П. Павлова Минздрава России, Рязань, Россия

Цель. Представить возможности электрокардиографического (ЭКГ) метода исследования в диагностике пароксизмальной тахикардии, в т.ч. при наличии дополнительных путей проведения импульса (ДПП). На клиническом примере пациента Р., 41 года, продемонстрированы возможности тривиального метода идентификации вида аритмии, механизма возникновения, а также топика дополнительного пути проведения при синдроме Вольфа-Паркинсона-Уайта. На представленной ЭКГ зарегистрирован укороченный PQ-интервал, дельта волна, уширенный желудочковый комплекс с нарушением процессов реполяризации. Наличие положительной формы комплекса QRS в отведениях aVL и V1 позволило предположить наличие ДПП левосторонней заднебоковой локализации. **Заключение.** Широкодоступный рутинный метод ЭКГ исследования позволяет определить характер аритмии, выбрать лечебную тактику, оценить прогноз заболевания, предваряя выполнение сложных инвазивных манипуляций.

Ключевые слова: пароксизмальная атриовентрикулярная реципрокная тахикардия; синдром Вольфа-Паркинсона-Уайта; ортодромная атриовентрикулярная тахикардия.

CLINICAL OBSERVATION OF PAROXYSMAL ATRIOVENTRICULAR RECIPROCAL TACHYCARDIA IN INTERMITTENT WOLFF-PARKINSON-WHITE SYNDROME

N.P. Pavlova, N.M. Artemova, E.A. Maksimtseva, O.M. Uryasiev

Ryazan State Medical University, Ryazan, Russia

Aim. To present potentials of electrocardiographic (ECG) research method in the diagnosis of paroxysmal tachycardia, as well as in the presence of additional conduction pathways (DPP). To demonstrate potentials of a trivial method for identification of the type of arrhythmia, the mechanism of occurrence, and topics of the additional conduction pathway in Wolf-Parkinson-White syndrome on a clinical example. **Conclusion.** A widely available routine method of the ECG allows to determine the nature of arrhythmia, to choose the treatment tactics, to assess the prognosis of the disease, prior to performing complex invasive procedures.

Keywords: paroxysmal atrioventricular reciprocal tachycardia; Wolff-Parkinson-White syndrome; orthodromic atrioventricular tachycardia.

Paroxysmal atrioventricular reciprocal tachycardia (AVRT) develops in patients with

existing accessory pathways for conduction of excitation impulse between atria and ventri-



cles. Normally excitation is conducted through the atrioventricular node and His-Purkinje system. A congenital anomaly in the form of existence of a muscular bundle between atria and ventricles that is the basis for the phenomenon of pre-excitation of ventricles and functions as an accessory conduction pathway (ACP) for the impulse. The accessory pathway may have different localizations that is confirmed by invasive (epicardial and endocardial) or body surface electrocardiographic mapping [1-3].

Attempts to find electrocardiographic criteria for determination of localization of an accessory pathway were many times undertaken by researches [2-5]. The key element of all the described schemes is determination of the direction of delta wave vector (first 20-40 ms of the ventricular complex). Along with the signs of F. Rosenbaum, et al. (1945) permitting to identify only the left and right bundles, other criteria were proposed by O.A. Obel and A.J. Camm (1998) that permitted to identify 9 variants of localization of an accessory pathway [6,7]. L.A. Bokeria and A.Sh. Revishvili (1999) elaborated the most comprehensive scheme for topical diagnostics of the pre-excitation region in children and described 12 variants of it [8].

The incidence of ACP in the total population is 0.1-0.3% cases and is twice as common in males [9,10]. About 70% of patients with pre-excitation syndrome have no organic pathology of the heart [9]. Up to 15% of patients with pre-excitation syndrome have multiple ACPs [6].

The second most common supraventricular paroxysmal tachycardia after atrioventricular nodular tachycardia is AVRT with participation of ACP. It accounts for 80% of all arrhythmias in Wolff-Parkinson-White (WPW) syndrome [12,13]. As a rule, the onset of paroxysmal AVRT occurs in individuals under 40 years of age [14].

In most patients with the syndrome of pre-excitation of ventricles, the anterograde refractory period of an ACP is longer than of the conduction system, and if supraventricular extra systole which gives a start to tachycar-

dia, comes to ACP when it is in refractory period, it is conducted to ventricles through the AV node, and in the retrograde direction – through ACP. In this case a paroxysm of orthodromic AVRT is triggered (85-90% of all paroxysmal reciprocal tachycardia in syndrome of pre-excitation of ventricles). Much less common is antidromic tachycardia when excitation impulse travels anterograde via an ACP and retrograde – via the atrioventricular node. In this case tachycardia is recorded with wide ventricular complexes [15].

Clinical Case. Patient R., 41 years old, was delivered to hospital ER (Ryazan) by ambulance team (AT) with complains of a sudden attack of palpitation accompanied by discomfort in the chest. The palpitation attack developed in the usual working conditions without provoking psychoemotional and physical factors. Until the moment of delivery to hospital the patient did not consider himself ill and had no cardiologic anamnesis. The AT recorded supraventricular tachycardia in the ECG with heart rate (HR) 150 beats per minute. The patient was hospitalized to the cardiologic department.

On examination the general condition corresponded to severity of the disease. The patient was excited, emotionally labile. Skin of usual color and moistness. Normosthenic build, supernutrition, height 174 cm, weight 82 kg, body mass index (BMI) 27.2 kg/m². Over lungs vesicular breathing, no crackles, respiratory rate 20 per minute. The borders of deep cardiac dullness not expanded. In auscultation, heart sounds of sufficient sonority, regular rhythm. HR 150 beat/min, arterial pressure 140 and 94 mm Hg. The abdomen soft, painless to palpation, the lower edge of the liver is determined by the level of the costal margin. No peripheral edema.

In the ECG tachycardia was recorded with narrow ventricular complexes with HR 150 beat/min, absence of P waves, probably from the atrioventricular node, normal orientation of the electrical axis of the heart (Figure 1).

In 10 minutes after intravenous slow introduction of propanorm solution at a dose

123 mg (at the rate of 1.5 mg/kg), sinus rhythm was recorded in the ECG. The patient felt better.

In the ECG in dynamics sinus rhythm was recorded, intermittent WPW phenomenon (Figure 2).



Fig. 1. ECG on delivery

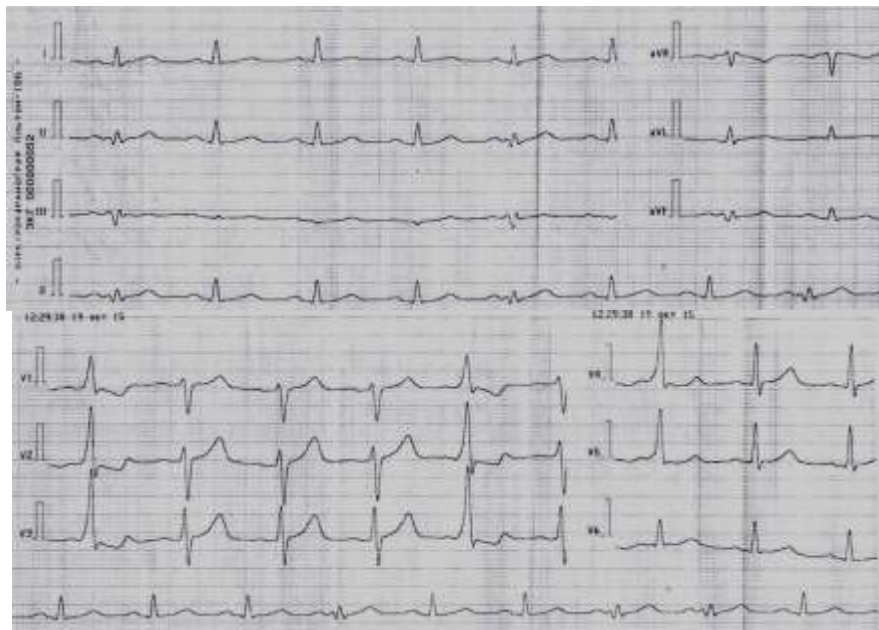


Fig. 2. ECG in dynamics

In the given ECG (Figure 2), a shortened PQ interval, delta wave, widened ventricular complex with disorders in repolarization processes were recorded in the 1st and 5th complexes. The presence of positive QRS

complex in a VL and V1 leads suggests the existence of ACP of the left posterolateral localization.

The results of echocardiography: the aorta of normal dimension, 20-35 mm, a mild

enlargement of the left atrium (41*50 mm), left ventricle of normal size (the end-diastolic dimension 47 mm, the end-systolic dimension 29 mm), the right atrium not enlarged (33*42 mm), the right ventricle of normal dimension. Ejection fraction of LV 66% (norm). Disorder in the function of relaxation of the left ventricle: VA>VE, the time of isovolumic relaxation (IVRT) 0.11 s. 1-2 Degree mitral regurgitation, 1 degree tricuspid regurgitation. *Conclusion on echocardiography:* mild enlargement of the left atrium. Disorders in the diastolic function of the LV of the 1 type. Moderate regurgitation of the mitral valve. Mild regurgitation of the tricuspid valve.

Common blood count and common urine test: with no pathology. Biochemical blood test: total protein: 65 g/L, AST 19 Un/L, ALT 22 Un/L, creatinine 97 µmol/L (glomerular filtration rate 83 mL/min*1.73 m²), glucose 5.6 mmol/L, total cholesterol 5.6 mmol/L, high density lipoproteins 1.4 mmol/L, low density lipoproteins 3.2 mmol/L, triglycerides 0.8 mmol/L.

Differential diagnosis with atrioventricular nodular tachycardia was conducted. Existence of paroxysm of tachycardia with narrow ventricular complexes without P wave and the phenomenon of pre-excitation of ventricles with sinus rhythm in subsequent ECGs permitted to diagnose paroxysmal

AVRT with intermittent Wolff-Parkinson-White syndrome. Taking into account the late onset of arrhythmia, absence of unfavorable cardiologic anamnesis and of organic pathology of the heart, it was decided not to resort to prophylactic antiarrhythmic therapy leaving the patient for dynamic outpatient observation.

Taking into account repeated episodes of elevation of the arterial pressure above 140 and 90 mm Hg, echocardiography data (1 type diastolic dysfunction of the left ventricle and moderate enlargement of the left atrium), the patient was administered hypotensive monotherapy with a preparation of the group of angiotensin converting enzyme (ACE) inhibitor. Measures were recommended to reduce the body mass to achieve the normal BMI, also systematic control of the arterial pressure, 24-hour monitoring of the arterial pressure for assessment of the effectiveness of the conducted therapeutic measures.

Conclusion

The given clinical case of patient R., 41 years old, demonstrated that a widely available examination method – electrocardiography – permits to determine the character of arrhythmia, to choose treatment tactics, to evaluate the prognosis for the disease before administration of complicated invasive manipulations.

Литература

1. Бокерия Л.А. Аномалия Эбштейна. М.; 2005.
2. Бокерия Л.А., Бокерия О.Л., Меликулов А.Х., и др. Электрокардиографическая и электрофизиологическая топическая диагностика синдрома Вольфа-Паркинсона-Уайта и результаты радиочастотной абляции дополнительного предсердно-желудочкового соединения у больных с аномалией Эбштейна // *Анналы аритмологии*. 2013. Т. 10, №4. С. 180-186. doi:10.15275/annaritmol.2013.4.1
3. Бокерия Л.А., Филатов А.Г., Ковалев А.С., и др. Использование многополюсных картирующих электродов для картирования пароксизмальной предсердной тахикардии // *Анналы аритмологии*. 2013. Т. 10, №4. С. 221-226. doi:10.15275/annaritmol.2013.4.6
4. Горбунова Д.Ю., Моргунова З.А., Урясьев О.М. Клинические и лабораторные особенности сочетанного течения метаболического и суставного синдромов // *Российский медико-биологический вестник имени академика И.П. Павлова*. 2018. Т. 26, №2. С. 229-237. doi:10.23888/PAVLOVJ2018262229-237
5. Похачевский А.Л., Лапкин М.М. Регуляция сердечного ритма при нагрузочном тестировании // *Российский медико-биологический вестник имени академика И.П. Павлова*. 2014. Т. 22, №4. С. 47-53.
6. Мазур Н.А. *Практическая кардиология*. М.; 2015.
7. Obel O.A., Camm A.J. Supraventricular tachycardia: ECG and anatomy // *European Heart Journal*. 1997. Vol. 18. P. 2-11. doi:10.1093/eurheartj/18.suppl_C.2
8. Бокерия Л.А. Катетерная абляция у пациентов детского и юношеского возраста. М.; 1999.
9. Munger T.M., Packer D.L., Hammill S.C., et al. A population study of the natural history of Wolf-Parkinson-White syndrome in Olmsted County, Minnesota 1953-1989 // *Circulation*. 1993. Vol. 87. P. 866-873. doi:10.1161/01.cir.87.3.866
10. Coudevenos J.A., Katsouras C.S., Graekas G., et al.

Ventricular pre-excitation in general population: a study on the mode of presentation and clinical course // *Heart*. 2000. Vol. 83. P. 29-34. doi:10.1136/heart.83.1.29

11. Chung E. *Manual of cardiac arrhythmia*. USA; 1986.
12. Ревишвили А.Ш. Клиническая кардиология: диагностика и лечение. М.; 2011.
13. Тереховская Ю.В., Смирнова Е.А. Нарушения ритма сердца у беременных // *Наука молодых (Eruditio Juvenium)*. 2017. №3. С. 462-480. doi:10.23888/HMJ20173462-480
14. Кручина Т.К., Васичкина Е.С., Егоров Д.Ф., и др. Феномен Вольфа-Паркинсона-Уайта у детей: результаты 17-летнего клинического наблюдения // *Кардиология*. 2012. №5. С. 30-37.
15. Bardy G.H., Packer D.L., German L.D., et al. Preexcited reciprocating tachycardia in patients with Wolf-Parcinson-White syndrome: incidence and mechanism // *Circulation*. 1984. Vol. 70. P. 377-391. doi:10.1161/01.cir.70.3.377

References

1. Bokeria LA. *Ebstein's Anomaly*. Moscow; 2005. (In Russ).
2. Bokeria LA, Bokeria OL, Melikulov AN, et al. Electrocardiographic and electrophysiological topical diagnosis of Wolf-Parkinson-White syndrome and results of radiofrequency ablation of additional atrioventricular junction in patients with Ebstein anomaly. *Annals of Arrhythmology*. 2013;10(4): 180-6. (In Russ). doi:10.15275/annaritm.2013.4.1
3. Bokeria LA, Filatov AG, Kovalev AS, et al. Use of multipolar mapping electrodes for mapping paroxysmal atrial tachycardia. *Annals of Arrhythmology*. 2013;10(4):221-6. (In Russ). doi:10.15275/annaritm.2013.4.6
4. Gorbunova DYU, Morgunova ZA, Uryasyev OM. Clinical and laboratory peculiarities of combined clinical course of metabolic and articular syndromes. *I.P. Pavlov Medical Biological Herald*. 2018;26(2):229-37. (In Russ). doi:10.23888/PAVLOVJ2018 262229-237
5. Pokhachevsky AL, Lapkin MM. Heart beat regulation during load test. *I.P. Pavlov Russian Medical Biological Herald*. 2014;22(4):47-53. (In Russ).
6. Mazur NA. *Practical cardiology*. Moscow; 2015. (In Russ).
7. Obel OA, Camm AJ. Supraventricular tachycardia: ECG and anatomy. *European Heart Journal*. 1997; (18):2-11. doi:10.1093/eurheartj/18.suppl_C.2
8. Bokeria LA. *Catheter ablation in children and adolescents*. Moscow; 1999. (In Russ).
9. Munger TM, Packer DL, Hammill SC, et al. A population study of the natural history of Wolf-Parcinson-White syndrome in Olmsted County, Minnesota 1953-1989. *Circulation*. 1993;87:866-73. doi:10.1161/01.cir.87.3.866
10. Coudevenos J.A., Katsouras C.S., Graekas G., et al. Ventricular pre-excitation in general population: a study on the mode of presentation and clinical course. *Heart*. 2000;83:29-34. doi:10.1136/heart.83.1.29
11. Chung E. *Manual of cardiac arrhythmias*. USA; 1986.
12. Revishvili ASH. *Clinical cardiology: diagnosis and treatment*. Moscow; 2011. (In Russ).
13. Terehovskaya YV, Smirnova EA. Arrhythmias in pregnant. *Nauka Molodykh (Eruditio Juvenium)*. 2017;(3):462-80. (In Russ). doi:10.23888/HMJ2017 3462-480
14. Kruchina TK, Vasichkina ES, Egorov DF, et al. Wolf-Parkinson-White Phenomenon in children: results of 17-year clinical observation. *Cardiology*. 2012;(5):30-7. (In Russ).
15. Bardy GH, Packer DL, German LD, et al. Preexcited reciprocating tachycardia in patients with Wolf-Parcinson-White syndrome: incidence and mechanism. *Circulation*. 1984;70:377-91. doi: 10.1161/01.cir.70.3.377

Дополнительная информация [Additional Info]

Источник финансирования. Бюджет ФГБОУ ВО Рязанский государственный медицинский университет им. акад. И.П. Павлова Минздрава России. [Financing of study. Budget of Ryazan State Medical University.]

Конфликт интересов. Автор декларирует отсутствие явных и потенциальных конфликтов интересов, о которых необходимо сообщить, в связи с публикацией данной статьи. [Conflict of interests. The author declares no actual and potential conflict of interests which should be stated in connection with publication of the article.]

Участие авторов. Павлова Н.П., Артемова Н.М., Максимцева Е.А. – клиническое наблюдение, анализ и перевод литературного материала, написание текста, Урясьев О.М. – концепция статьи, рецензирование. [Participation of authors. N.P. Pavlova, N.M. Artemova, E.A. Maksimtseva – clinical observation, analysis and translation of literary material, writing, O.M. Uryasiev – the concept of the article, editing.]

Информация об авторах [Authors Info]

*Павлова Наталья Петровна – к.м.н., доцент кафедры факультетской терапии с курсом терапии факультета дополнительного постдипломного образования, ФГБОУ ВО Рязанский государственный медицинский университет им. акад. И.П. Павлова Минздрава России, Рязань, Россия. [Natalya P. Pavlova – MD, PhD, Associate Professor of the Department of Faculty Therapy with the Therapy Course of the Additional Postgraduate Education Faculty, Ryazan State Medical University, Ryazan, Russia.]
SPIN: 9310-9159, ORCID ID: 0000-0003-1545-7313. E-mail: natusik.ryazan@mail.ru

Артемова Нина Михайловна – к.м.н., доцент кафедры факультетской терапии с курсом терапии факультета дополнительного постдипломного образования, ФГБОУ ВО Рязанский государственный медицинский университет им. акад. И.П. Павлова Минздрава России, Рязань, Россия. [**Nina M. Artemova** – MD, PhD, Associate Professor of the Department of Faculty Therapy with the Therapy Course of the Additional Postgraduate Education Faculty, Ryazan State Medical University, Ryazan, Russia.]
SPIN: 7814-0284, ORCID ID: 0000-0002-6170-3442.

Максимцева Елена Анатольевна – к.м.н., доцент кафедры факультетской терапии с курсом терапии факультета дополнительного постдипломного образования, ФГБОУ ВО Рязанский государственный медицинский университет им. акад. И.П. Павлова Минздрава России, Рязань, Россия. [**Elena A. Maksimtseva** – MD, PhD, Associate Professor of the Department of Faculty Therapy with the Therapy Course of the Additional Postgraduate Education Faculty, Ryazan State Medical University, Ryazan, Russia.]
SPIN: 5505-4415, ORCID ID: 0000-0003-3528-6398.

Урясьев Олег Михайлович – д.м.н., профессор, зав. кафедрой факультетской терапии с курсом терапии факультета дополнительного постдипломного образования, ФГБОУ ВО Рязанский государственный медицинский университет им. акад. И.П. Павлова Минздрава России, Рязань, Россия. [**Oleg M. Uryasiev** – MD, PhD, Professor, Head of the Department of Faculty Therapy with the Therapy Course of the Additional Postgraduate Education Faculty, Ryazan State Medical University, Ryazan, Russia.]
SPIN: 7903-4609, ORCID ID: 0000-0001-8693-4696, Researcher ID: S-6270-2016.

Цитировать: Павлова Н.П., Артемова Н.М., Максимцева Е.А., Урясьев О.М. Клиническое наблюдение пароксизмальной атриовентрикулярной реципрокной тахикардии при интермиттирующем синдроме Вольфа-Паркинсона-Уайта // Российский медико-биологический вестник имени академика И.П. Павлова. 2019. Т. 27, №3. С. 407-412. doi:10.23888/PAVLOVJ2019273407-412

To cite this article: Pavlova NP, Artemova NM, Maksimtseva EA, Uryasiev OM. Clinical observation of paroxysmal atrioventricular reciprocal tachycardia in intermittent Wolff-Parkinson-White syndrome. *I.P. Pavlov Russian Medical Biological Herald.* 2019;27(3):407-12. doi:10.23888/PAVLOVJ2019273407-412

Поступила/Received: 06.03.2019
Принята в печать/Accepted: 16.09.2019