

CASE REPORT ΕΝΔΙΑΦΕΡΟΥΣΑ ΠΕΡΙΠΤΩΣΗ

Transient right bundle-branch block in anterior descending coronary occlusion

Coexistent acute coronary syndrome with bundle-branch block can have a poor outcome, and primary percutaneous coronary intervention is an option for patients with persistent ischemic symptoms and a recent right bundle-branch block (RBBB). This condition poses a diagnostic challenge, with differentiation from transmural ischemia and ST-elevation myocardial infarction (STEMI), beside which, new-onset RBBB can follow acute myocardial infarction. As new-onset transient RBBB in a patient with STEMI carries high risk for short-term mortality, emergency invasive stratification should be performed at the earliest possible. The aim of this case study is to enhance the suspicion index of primary health care workers about this clinical entity, which may evolve when unsuspected, misdiagnosed or not well-controlled.

Ischemic heart disease is the leading identifiable cause of death worldwide,¹ and the World Health Organization (WHO) reported that coronary artery disease (CAD) was responsible for more than 7.2 million deaths in 2008, representing 12.7% of the total in that year, with a projected increase to 11.1 million in 2020.^{2,3} Instability of an atherosclerotic plaque can lead to an acute coronary syndrome (ACS); a condition that is classically categorized into acute ST-segment elevation myocardial infarction (STEMI), non-ST-segment elevation myocardial infarction (NSTEMI), and unstable angina (UA). The positivity of myocardial necrosis markers and the electrocardiographic (ECG) pattern are the main discriminators between these categories. The presence of ST-segment elevation in relation to a J point equal to or greater than 1.0 mm (0.1 mV) in two or more contiguous leads confirms a STEMI. In the leads V2 and V3, the magnitude of ST-segment elevation must be greater: ≥ 2.5 mm in young men, ≥ 2.0 mm in men aged over 40 years and ≥ 1.5 mm in women.⁴

Despite the well-established and universally recommended ECG criteria in various national and international guidelines, there are numerous clinical situations and ECG patterns that are also correlated with acute coronary occlusion or sub-occlusion, and the better understanding of these patterns is essential to definition of the stratification strategy and institution of reperfusion therapy in a timely manner.¹ Of note among these patterns is the development of a right bundle branch block (RBBB) in the presence of symptoms compatible with coronary ischemia, a condition briefly covered in the relevant European guidelines.^{1,5,6} Case studies and specific research on this important subject are still scarce, especially in the Brazilian literature.^{7,8}

CASE PRESENTATION

A 59-year-old woman with a history of hypertension, dyslipidemia and smoking, who was receiving treatment with captopril and hydrochlorothiazide, presented with a history of anginal pain

ARCHIVES OF HELLENIC MEDICINE 2023, 40(1):123–127
ΑΡΧΕΙΑ ΕΛΛΗΝΙΚΗΣ ΙΑΤΡΙΚΗΣ 2023, 40(1):123–127

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Παροδικός αποκλεισμός δεξιού
σκέλους σε απόφραξη
του πρόσθιου κατιόντος κλάδου
της στεφανιαίας αρτηρίας

Περίληψη στο τέλος του άρθρου

Key words

Bundle-branch block
Coronary syndrome
Imaging
Prognosis
Treatment

Submitted 15.3.2022

Accepted 2.4.2022

for six months, initially triggered by exertion, with progressive increase in intensity and duration, and ultimately occurring even at rest. At her most recent outpatient consultation, the ECG revealed a RBBB not seen on previous ECG (fig. 1A). She was referred to the cardiology emergency room, where, apart from the troponin I levels, the results of laboratory determinations were unremarkable (tab. 1). During invasive stratification (fig. 2A), a sub-occlusive lesion was identified in the anterior descending coronary artery (ADC), and significant lesions in the right and circumflex (Cx) coronary arteries. Angioplasty with a drug-eluting stent was performed

Table 1. Female aged 59 years, with continuous angina: Levels of troponin I.

Time of determination	Troponin I*
Day 1 (20:00 hs)	26.294 ng/mL
Day 2 (01:57 hs)	26.934 ng/mL
Day 3 (16:52 hs)	20.938 ng/mL
Day 4 (11:25 hs)	12.825 ng/mL
Day 5 (08:03 hs)	2.493 ng/mL

* Normal range (women): 0.008–0.018 ng/mL

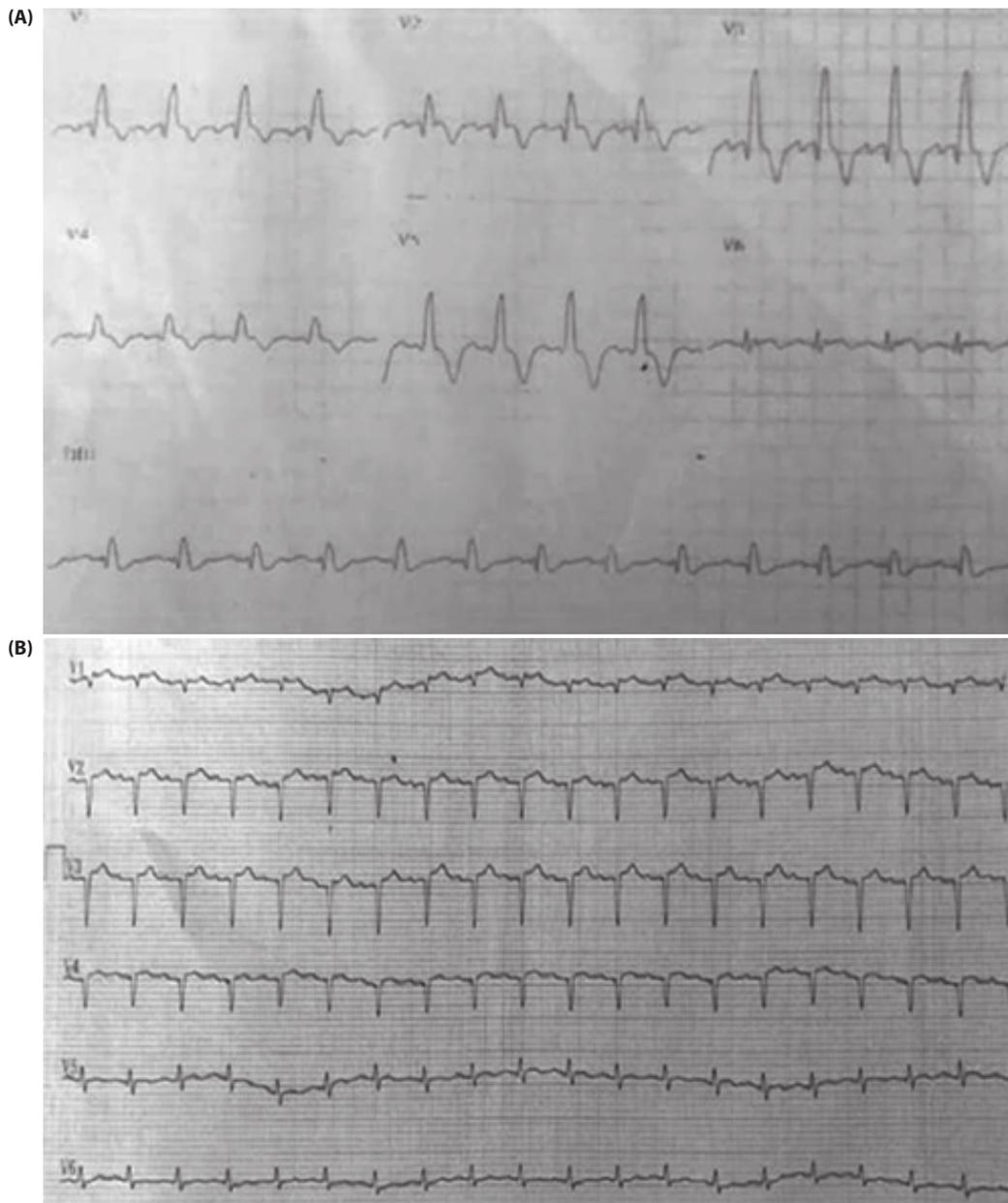


Figure 1. Female aged 59 years, with continuous angina: Electrocardiogram showing (A) right bundle branch block, in the presence of chest pain and (B) normal appearance after percutaneous coronary intervention.

in the ADC and Cx, along with clinical treatment of the ADC that had a good collateral circulation. Following the procedures, there was complete elimination of the chest pain and disappearance of the RBBB (fig. 1B), and angiography showed improvement of the coronary circulation (fig. 2B). With an unremarkable clinical recovery, she was discharged for outpatient follow-up.

DISCUSSION

Pathological ECG patterns, other than the classic ST-segment elevation in two contiguous leads, correlated with the existence of an occlusive or subocclusive lesion in an epicardial coronary artery, have been accorded increasing value in heart studies, and even included in updated international guidelines.⁴⁻⁶ The presence of dynamic ST-

segment and T-wave changes in the anterior wall (such as the pattern described by Wellens), signs of circumferential ischemia (such as ST-segment elevation in aVR associated with depression in six or more leads), or the presence of new, transient or permanent interventricular conduction blocks, are among the pathological patterns associated with a worse prognosis, motivating the adoption of an urgent invasive stratification strategy.⁴ Among interventricular conduction disorders, the evidence of new, or presumably new, left bundle branch block (LBBB) has always been considered an ominous factor in terms of evolution and prognosis, being classically equivalent of STEMI. The presence of a RBBB was relegated to a secondary role, and not even mentioned in some guidelines, but clinical evidence corroborated the notion that patients with STEMI who present RBBB are also at serious risks and may carry an even worse prognosis than those presenting LBBB.⁹

In a classic study, Roth and colleagues reviewed cases of STEMI treated over a three-year period at a single center. Of the 211 cases, eight (3.4%) were patients who presented new RBBB of which six underwent coronary angiography; in one patient, total occlusion of the left anterior descending artery (LADA) was observed, two patients had a multivesel lesion associated with severe stenosis in the left main coronary artery (LMCA) and the remaining three had severe stenosis in the proximal LADA. Irrigation of the right branch, usually by the first major septal branch, justifies the development of RBBB in cases of severe involvement of the trunk or proximal LADA.¹⁰ Analysis of a cohort of 6,742 patients with acute myocardial infarction in eight European hospitals led to the conclusion that a new RBBB was the second most frequent ECG pattern in patients with total LMCA occlusion; in addition, patients with old or new RBBB showed a similar mortality rate to patients with old or new LBBB: 14.3% vs 13.1% ($p=0.268$).¹¹ Considering only the cases of new blocks, the presence of RBBB was one of the main factors associated with in-hospital mortality, surpassing even the presence of a new LBBB (18.8% vs 13.2%, $p<0.05$). The publication of those data led to the modification of the European guidelines, with the recommendation of emergency invasive stratification in cases of ischemic symptoms coexisting with the development of RBBB.^{5,6} Cohort studies and meta-analyses corroborate this information, showing higher mortality in patients with RBBB than in those without ventricular conduction disorder; in addition, the presence of a new block induced by ischemia, confers a worse prognosis than an old block.⁹⁻¹²

The evaluation described by Wang and colleagues also confirmed that ECG branch block reversal after coronary reperfusion is associated with better prognosis, specifically,

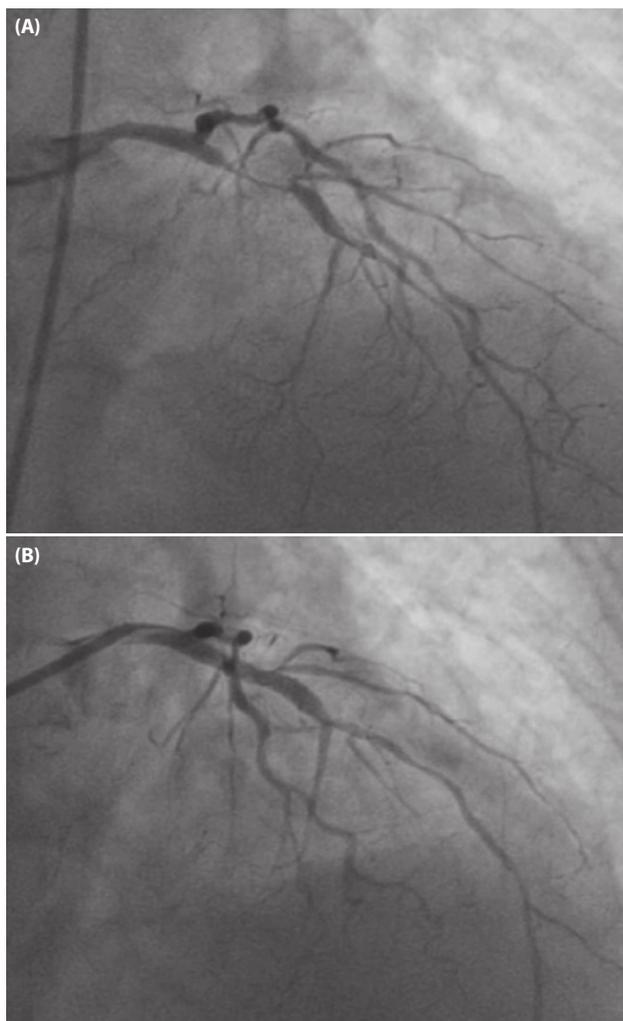


Figure 2. Female aged 59 years, with continuous angina: Angiogram showing anterior descending artery in right cranial oblique projection (A) before percutaneous coronary intervention, and (B) after the intervention.

up to 80% reduction in the one-year mortality [RR 0.2, 95% CI (0.11–0.33), $p < 0.001$].¹²

Additional concerns have been expressed about collateral effects of the COVID-19 pandemic on the ACS-related mortality, in both developed and developing regions, including prehospital delay and its impact on the major factors for survival, which that are prompt diagnosis and intervention.^{13,14} A decline in hospitalizations for UA, STEMI and NSTEMI was recorded in Greece, but with no apparent increase in the mortality of patients with ACS who may not have received adequate care.¹³ Yusniawati and colleagues commented on the predicted increasing mortality rates of approximately 29% in women and 48% in men in developed countries, compared with 120% in women and 137% in men in developing countries, and stressed that resting to control chest pain is the main factor associated with pre-hospital delay in patients suffering ACS.¹⁴

CONCLUSION

This case report highlights the importance of a thorough ECG evaluation in the case of ACS, and shows that other findings may appear in the examination in addition to those included in the guidelines and institutional protocols, which are related to critical lesions in the epicardial coronary arteries, giving rise to the need for an invasive stratification on an emergency basis, to reduce the morbidity and mortality of patients with ACS.

ACKNOWLEDGMENTS

The authors would like to thank Almir José Batista, a specialized photographer in Medical Imaging Documentation from Brasília-DF, Brazil for the images that illustrate this manuscript.

ΠΕΡΙΛΗΨΗ

Παροδικός αποκλεισμός δεξιού σκέλους σε απόφραξη του πρόσθιου κατιόντος κλάδου της στεφανιαίας αρτηρίας

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Αρχεία Ελληνικής Ιατρικής 2023, 40(1):123–127

Το οξύ στεφανιαίο σύνδρομο με συνοδό αποκλεισμό του δεξιού σκέλους μπορεί να έχει πτωχή έκβαση και η πρωτογενής διαδερμική στεφανιαία παρέμβαση είναι μια επιλογή για ασθενείς με επίμονα ισχαιμικά συμπτώματα και πρόσφατο αποκλεισμό δεξιού σκέλους. Η κατάσταση αυτή διευκολύνει στην ανίχνευση διατοιχωματικής ισχαιμίας και εμφράγματος του μυοκαρδίου με ανύψωση του ST (STEMI), επειδή ο πρόσφατος έναρξης αποκλεισμός του δεξιού σκέλους μπορεί να ακολουθεί οξύ έμφραγμα του μυοκαρδίου. Καθώς μια πρόσφατη εμφάνιση δεξιού αποκλεισμού σε ασθενή με STEMI ενέχει υψηλό κίνδυνο για βραχυπρόθεσμη θνητότητα, η επείγουσα επέμβαση θα πρέπει να γίνεται χωρίς καθυστέρηση. Απαιτείται προσοχή των εργαζομένων στην πρωτοβάθμια φροντίδα για τη σωστή κατανόηση και την αντιμετώπιση της εν λόγω κατάστασης.

Λέξεις ευρετηρίου: Αποκλεισμός δεξιού σκέλους, Θεραπεία, Πρόγνωση, Στεφανιογραφία

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