INTRODUCTION

Centrally-located peripheral venous catheters are used for the administration of various treatments and for hemodynamic monitoring.1-4 In patients with acute myocardial infarction (AMI), implantation of a central catheter via the cephalic or basilic vein has the advantage of rapid pharmacological delivery without complications in its fifth day of evolution, after being treated with platelet inhibitors in addition to the initial anticoagulant and fibrinolytic therapy. We present a case of thrombosis in the superior vena cava and in the right atrium related to a peripherally inserted central catheter in this clinical context. The utility of transesophageal and transthoracic echocardiography in the differential diagnosis with other cardiac structures and in the evolutionary control is commented. Likewise, potential complications and the treatment of this pathology are discussed.

Key words: Catheters. Thrombosis. Echocardiography.

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Catheter-Related Central Venous Thrombosis in the Course of an Uncomplicated Acute Myocardial Infarction: Diagnostic Usefulness of Echocardiography

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In certain cases such as cancer patients or patients with coagulopathies, the venous thrombosis is a frequent complication that is associated with the implantation of central venous catheters. However, it is uncommon in other contexts, such as acute myocardial infarction without complications in its fifth day of evolution, after being treated with platelet inhibitors in addition to the initial anticoagulant and fibrinolytic therapy. We present a case of thrombosis in the superior vena cava and in the right atrium related to a peripherally inserted central catheter in this clinical context. The utility of transesophageal and transthoracic echocardiography in the differential diagnosis with other cardiac structures and in the evolutionary control is commented. Likewise, potential complications and the treatment of this pathology are discussed.

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Trombosis venosa central asociada a catéter en el curso de un infarto agudo de miocardio no complicado: utilidad diagnóstica de la ecocardiografía

En ciertos casos, como en los enfermos oncológicos o con coagulopatías, la trombosis venosa es una complicación frecuente asociada a la inserción de catéteres centrales venosos. Sin embargo, es rara en otros contextos, como el de un infarto agudo de miocardio no complicado en su quinto día de evolución, tratado con terapia antiagregante además del tratamiento anticoagulante y fibrinolítico inicial. Se presenta un caso de trombosis de vena cava superior y aurícula derecha, secundario a un intra-catéter periférico de localización central en dicho contexto clínico. Se comenta el papel de la ecocardiografía transtorácica y transesofágica en el diagnóstico diferencial con otras estructuras cardíacas y en el seguimiento evolutivo. Asimismo, se discuten las potenciales complicaciones y el tratamiento de esta afeción.

Palabras clave: Catéteres. Trombosis. Ecocardiografía.
during the course of an acute myocardial infarction (AMI). The diagnosis of thrombosis of the catheterized central veins (TCCV) was made by echocardiography.

**CLINICAL CASE**

A 55-year-old patient, a smoker, was admitted to our hospital with acute ischemic heart disease. After posterior inferior AMI was diagnosed, platelet aggregation inhibitor treatment was initiated (through an indwelling Drum Cartridge® catheter introduced into the right basilic vein up to the right subclavian) with acetylsalicylic; fibrinolitic with alteplase (Actilise®), 100 mg in 90 minutes, and anticoagulant with intravenous sodium heparin (Heparin-Leo®) in perfusion for 72 hours. The patient’s clinical course was uneventful, except for the appearance of discrete signs of thrombophlebitis in the right upper extremity 5 days after admission; the catheter was removed for this reason.

Routine transthoracic echocardiography (TTE) performed on the fifth day revealed a linear image in the right atrium. As a result, transesophageal echocardiography (TEE) was performed, revealing thrombosis of the superior vena cava extending into the right atrium, shaped like the vein in which it had formed and without an anchor point, as the catheter had been removed (Figure 1). Following the diagnosis (also confirmed by helicoid thoracic computerized tomography) of thrombosis of the superior vena cava and the right atrium, anticoagulant intravenous heparin (Heparin-Leo®) treatment was reinitiated via continuous perfusion for 72 hours. The patient’s clinical course was uneventful, except for the appearance of discrete signs of thrombophlebitis in the right upper extremity 5 days after admission; the catheter was removed for this reason.

Fig. 1. Superior transesophageal plane: tortuous high density image of thrombus which extends into the right atrium (RA) and originating in the superior vena cava. LA indicates left atrium.
heter or thrombus of the wall with complete or partial occlusion of the venous vessel; in our patient it took the form of the original catheter, without an anchor point (since the conduit had been removed), characteristics that indicate a high embolization risk.14

Other diagnostic techniques, such as venography, thoracic helicoidal computerized tomography (also used in this case), scintillography with indium 111, etc., may be helpful for differential diagnosis and for calculating thrombus age.

The best therapy is prevention or early treatment (through early diagnosis) to reduce mortality and morbidity secondary to potential complications.

In spite of the known efficacy of non-divided heparin as an antithrombotic, it can cause secondary effects such as heparin-induced thrombocytopenia/thrombosis (HITT) (with a high risk of thrombosis)15,16 and hemorrhage; in low molecular weight heparin HITT has not been described, and it could have greater antithrombotic power (greater inhibition of coagulation X factor) than an anticoagulant (less inhibition of coagulation II factor), with its corresponding lesser risk of bleeding.17 Nevertheless, any of these prophylactic therapies is effective. Low doses of nitroglycerine in continuous perfusion, based on the liberation of nitric oxide and its vasodilator and antithrombotic effects, has also been proposed as preventative therapy; nevertheless its usefulness has not been proven.18

Initial action in serious cases should be supportive therapy and anticoagulant and fibrinolitic treatment.4 Cardiac surgery should be reserved for those serious cases where fibrinolitic treatment is contraindicated.4

Currently, although definitive treatment is catheter removal, there is not enough clinical evidence to establish when the catheter should be removed. It is reasonable to wait until the patient is stable enough to reduce the risk of embolization during the most serious period.6

In the patient described, 7 days anticoagulation with heparin was sufficient for the disappearance of the thrombus; later treatment with acenocoumarol was started and lasted for 1 month. Fibrinolitic treatment was not used, as the clinical stability of the patient indicated a high risk to benefit coefficient.

Although the purpose of this report was to present the important role of TEE in the diagnosis and management of TCCV, this does not mean that it must be the primary diagnostic technique performed when there is a suspicion of TCCV, but that it should complement the results of the physical examination and other tests such as TTE. With continued technological progress TTE images will become sharper and provide more information about these lesions; therefore, a high quality TTE should be performed first, and if this study is inconclusive, a TEE2 should be performed.

REFERENCES