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CASE REPORT

Mesothelial/monocytic incidental cardiac excrescence in autoimmune disease

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Abstract

Mesothelial/monocytic incidental cardiac excrescence (MICE) is a rare benign finding made of mesothelial cells, histiocytes, and fibrin, usually found during heart valve surgery. The clinical relevance resides in the potential misdiagnosis as metastatic carcinoma or arterial embolism. The pathogenesis remains uncertain, with artifactual and reactive hypotheses. Here we present a case of MICE with paradigmatic clinical, imaging, and histological features in a 28-year-old woman with undifferentiated connective tissue disease without previous cardiac catheterization with possible pathogenesis, highlighting the importance of awareness of the existence of this lesion in patients with autoimmune disease.

KEYWORDS

cardiovascular pathology, left atrial mass, mesothelial/monocytic incidental cardiac excrescence, undifferentiated connective tissue disease

1 | INTRODUCTION

Mesothelial/monocytic incidental cardiac excrescence (MICE) is a rare nonneoplastic lesion composed of histiocytes, mesothelial cells, fibrin, and scattered inflammatory cells without supporting stroma. It is usually detected during cardiac surgery, frequently attached to the left-heart valves. MICE is equally distributed among males and females, mainly involving individuals older than 60.[1] To date, approximately 50 cases have been reported in the literature and its etiology remains controversial.[2] The "reactive" pathogenetic theory emphasizes the role of mechanical irritation or inflammation as triggers for the formation. Luthringer et al[3] suggested that a possible mechanism is ingrowth of pericardial mesothelial cells along a perforation tract caused by cardiac catheterization. The "artifactual" pathogenetic theory invokes iatrogenic clustering of free-floating cells that enter the heart during cardiac surgery.[4]

Herein we report an unusual case of MICE in a 28-year-old female with undifferentiated connective tissue disease (UCTD), autoantibody positivity and venous thrombosis during pregnancy without previous cardiac catheterization.

2 | CASE REPORT

A 28-year-old female with diagnosis of UCTD, several autoantibody positivities include antinuclear antibody (ANA), antidouble-stranded DNA autoantibody (anti-dsDNA), lupus anticoagulant (LA), anti-β2 glycoprotein 1 (anti-β2 GPI), hypertension, one prior abortion, and cephalic vein thrombosis during pregnancy presented with fever, urinary tract infection, and oral paresthesia during a hypertensive crisis. Computed tomography was negative for acute ischemic/hemorrhagic events. Transthoracic echocardiography showed a mobile mass attached to the posterior leaflet of the mitral valve and moderate valve incompetence (Figure 1A,B). She denied any history of heart valve disease or prior cardiac catheterization. Because of the high-risk of systemic embolization, she underwent mitral valve surgery. After exposure of the mitral valve, a friable mass measuring 15 × 12 mm attached to the posterior leaflet of the mitral

Vera Cetera and Nunzio Davide de Manna contributed equally.

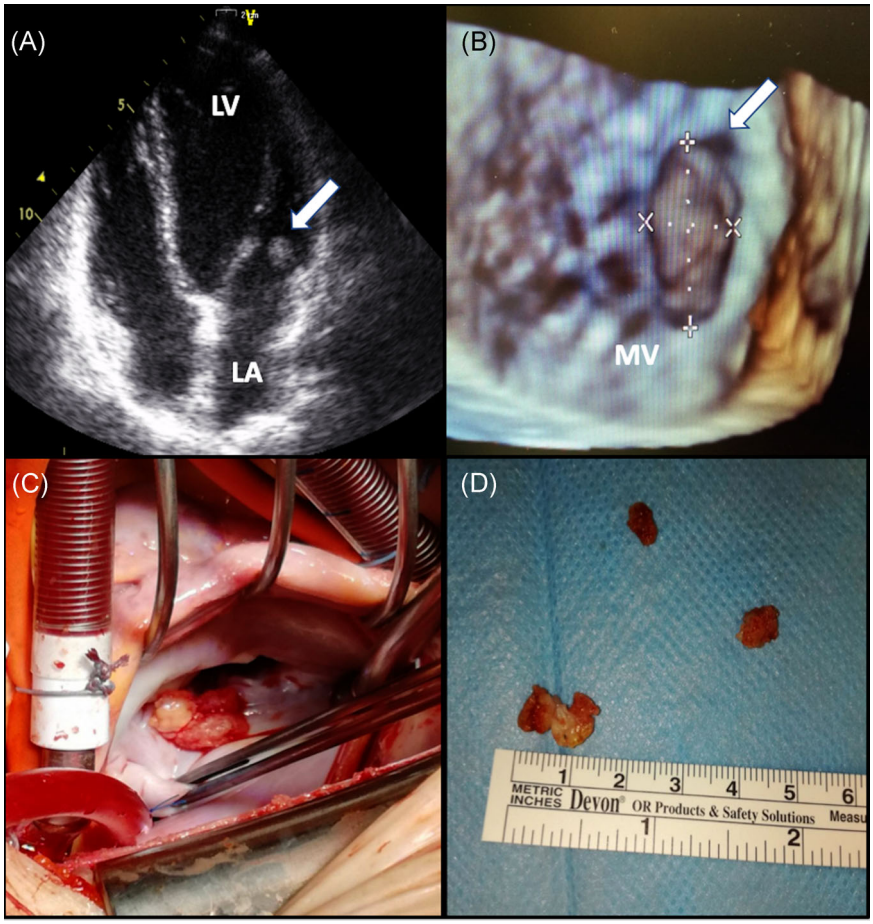

FIGURE 1 A, Transthoracic echocardiography demonstrated a mobile mass attached to the posterior leaflet of the mitral valve (arrow). B, Three-dimensional intraoperative transesophageal echocardiography confirming previous details. C, Intraoperative view of the mass after left atriotomy. D, Gross appearance of the mass with an encapsulated, solid, jelly-form structure, appearing as a pale thrombus. LA, left atrium; LV, left ventricle; MV, mitral valve

valve was excised, allowing to preserve the native valve (Figure 1C,D).

At the histopathological examination, the lesions were composed of fibrotic tissue with aggregates of histiocytoid cells with round nuclei, no atypical features and eosinophilic cytoplasm embedded in fibrin, together with fewer epithelioid cells of comparable size (Figure 2A,B). At immunohistochemistry most of the cells with round nuclei and abundant cytoplasm were monocytic in nature, being positive for CD31, CD68, and Mac-387 antigen, with a low Ki67 antigen index (10%), while the fewer mesothelial cells were positive to WT1 and podoplanin (Figure 2C-F). Accordingly, the lesion was diagnosed as MICE. The postoperative course was uneventful. The patient was transferred to a cardiac rehabilitation facility carrying out the medical therapy with acetylsalicylic acid, prednisone, azathioprine, and hydroxychloroquine for her immunological disorder. At 2-month follow-up she was asymptomatic and transthoracic echocardiography showed no recurrence or residual lesion, normal mitral valve function and preserved ejection fraction.

3 | DISCUSSION

Two theories have been proposed for MICE. The reactive theory suggests that mesothelial cells migrate from the serous pericardial surface in the cardiac left chamber in consequence of perforation of the cardiac wall during catheterization,[3] while the artifactual theory suggests that MICE is not a true proliferative lesion, but represents an artifact produced by suctioning of the pericardial cavity during cardiac surgery. The latter hypothesis lies that in the first studies the content of extracorporeal bypass pump filters and mediastinal drains had histologic features like MICE.[4] In a report by Argani et al[5] adenocarcinoma cells were seen embedded within MICE in absence of previous cardiac catheterization. The authors speculate that the formation of MICE could be induced by the procoagulant activity of proinflammatory substances secreted by invasive adenocarcinoma, thus highlighting that not all lesions with the characteristics of MICE can be dismissed as benign.[5] More recently, it has been proposed that MICE can be part of the entity called "histiocytosis with raisinoid nuclei", a large category comprising a number of the benign histiocytic proliferation of different body sites with similar histopathological features.[6] In this regard it was suggested a common background with monocytic, mesothelial and inflammatory cells participating to the lesion formation, representing unspecifically a reaction to injuries of various types: trauma, inflammation, neoplasia, or surgical manipulation, the last occurring in MICE.[6]

The present case features the classical intraoperative and pathological features of MICE, with location, gross appearance, dimension, and histological characteristics mostly described in the literature,[1,2] but without any previous cardiac invasive procedure. The patient suffered from UCTD with several autoantibody

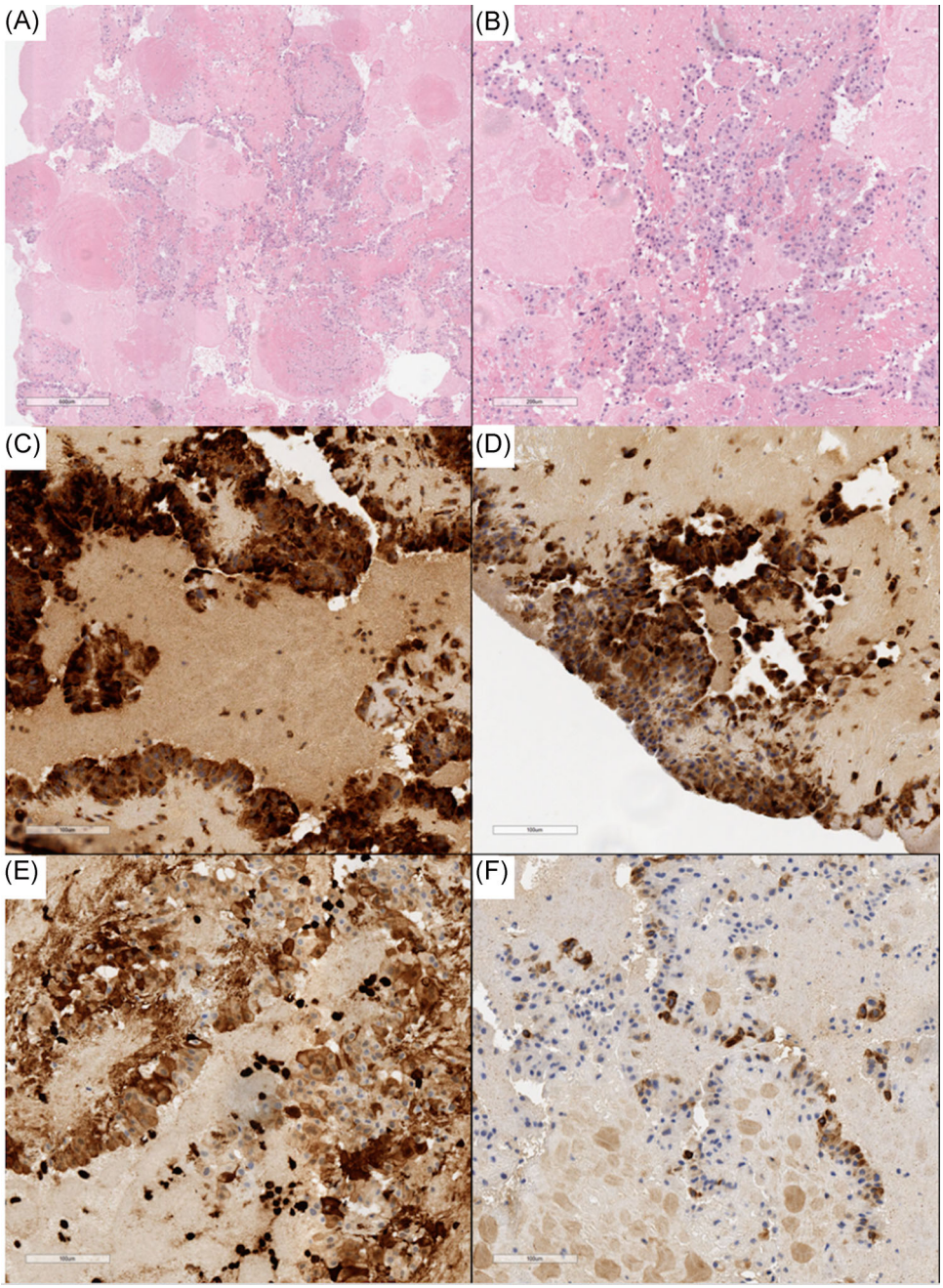

FIGURE 2 Pathological appearance of mesothelial/monocytic incidental cardiac excrescence, composed of histiocytes, mesothelial cells, and fibrin without supporting stroma stained in hematoxylin and eosin (A, B). Histiocytoid cells clearly stain for CD68 (C), CD31 (D), Mac387 (E), while fewer mesothelial cells stain for podoplanin (F). Original magnification: 40× (a), 100× (b) 200× (C-F)

positivities and vascular thrombosis while pregnant. UCTD is a term describing an unclassifiable systemic autoimmune disease with variable clinical and serological manifestations of connective tissue diseases that does not meet any criteria for established diseases.[7] Indeed, this entity includes a heterogeneous population with a broad range of immunologic abnormalities, symptoms, and blood markers.[7] Many immunologic abnormalities are seen in patients with UCTD, such as antiphospholipid antibody positivity, which are associated with a thrombophilic diathesis. Blood clots can form anywhere in the body and may lead to fetal loss, miscarriages, thromboses, autoimmune thrombocytopenia, strokes, transient ischemic attacks, myocardial infarction, intracardiac/pulmonary emboli, ventricular dysfunction, and pulmonary hypertension.[7] We speculate that in a patient with such a dysregulated inflammatory background "reactive" pathogenesis, in the sense of reaction to inflammatory stimuli as proposed by Michal et al[6] and not only to surgical stimulation as in the original theory, might be a suitable explanation. A similar case was previously reported by Ton et al,[8] in a patient with antiphospholipid syndrome. Clearly further cases of MICE in the absence of cardiac catheterization in patients with autoimmune/inflammatory

conditions are needed to reliably establish a causative correlation. The present case, however, highlights the importance of careful assessment and awareness of the existence of this often under-reported lesion in patients with autoimmune systemic disease.

CONFLICT OF INTERESTS

The authors declare that there are no conflict of interests.

AUTHOR CONTRIBUTIONS

VC and NDM helped in design and manuscript drafting; IG, EC, and AE reviewed and approved the final manuscript; AR, GBL, ADM, and GF designed, reviewed, and approved the final manuscript.

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