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# Post-Radiation Constrictive Pericarditis: Case Report

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**ABSTRACT**

Constrictive pericarditis secondary to radiation is a rare complication, due to its pathogenesis, the patient may present asymptomatic for a long period of time with a slight decrease in functional class that may go unnoticed, however, once constrictive physiology is established, presents greater functional deterioration, and favors the development of predominant arrhythmias, atrial fibrillation and preserved LVEF heart failure, the clinical course of the disease is progressive with high morbidity and mortality. The patient presented in the case report refers to the timely diagnosis through the different methods explained that leads to a favorable outcome.

**KEY WORDS:** Constrictive pericarditis, Pericardial diseases, post-radiation pericarditis

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## INTRODUCTION

Constrictive pericarditis is a common clinical syndrome characterized by decreased ventricular diastolic filling secondary to compression of the pericardium due to thickening[1]. Among the etiologies, the most frequent is tuberculous pericarditis in underdeveloped countries, followed by radiotherapy, neoplasms, purulent, uremic, and cardiac surgery; as well as idiopathic etiology. [2,3].

The initial diagnosis is clinical, since the form of presentation are signs and symptoms of venous congestion such as jugular plethora, Kussmaul's sign, paradoxical pulse, and pericardial coup. Occasionally, pleural effusion, hepatomegaly, and ascites can occur. [4]

The electrocardiogram can be normal in most cases, however the most common finding is atrial fibrillation with Ashman phenomenon [4].

The radiographic findings are characterized by the presence of pleural effusion, data of pulmonary congestion and in 27% it is possible to observe pericardial calcification, the CT is able to demonstrate the pericardial thickening (3-4mm) [5-7].

The Echocardiogram is a useful tool that corroborates the diagnosis since it provides anatomical, physiological and hemodynamic information, within the changes that are observed as highly suggestive suspicion is pericardial thickening greater than 4mm, it is worth mentioning that up to 20% of cases do not they will have it, other findings that they present are biatrial dilatation, displacement of the septum towards the LV during inspiration and to the RV during expiration (ventricular interdependence), mitral E wave variability with respiration >25%, e' wave >8 cm/s, septal notch, annulus reversus, and reverse diastolic flow in suprahepatic veins[8-10].

Treatment is surgical; in these cases, pericardiectomy is the surgery of choice with a IIa indication for symptomatic patients with chronic pericarditis secondary to radiation[11-15].

## CLINICAL CASE

This case report describes a 56-year-old female who has cardiovascular risk factors: sedentary, consumption of an atherogenic diet, overweight with a BMI of 27, active smoking with an IT 40 packs/year, long-standing Systemic Arterial Hypertension in treatment with angiotensin receptor blockers (Candesartan), history of rhythm disorders of the atrial fibrillation type in treatment with cardioselective beta-blocker (bisoprolol) and anticoagulation with coumarins (acenocoumarin) for a CHA2DS2-VASc Score of 3, Hypothyroidism in treatment with thyroid hormone replacement (levothyroxine) a history of moderately

differentiated ductal carcinoma in situ breast cancer, which received treatment based on chemotherapy with a scheme of 14 sessions of carboplatin, paclitaxel and later doxorubicin, cyclophosphamide, docetaxel; 25 radiotherapy sessions in addition to surgical treatment with right radical mastectomy.

Current condition begins with a decrease in functional class of 18 months of evolution manifested by symptoms of Heart Failure characterized by dyspnea on medium efforts, on cardiovascular examination: he presented grade I jugular plethora, without carotid murmurs, no hepatojugular reflux, HR 89 bpm, PAS 118 mmhg, Precordio tip shock fifth intercostal space left midclavicular line, without sternal elevation, S1 variable intensity, S2 physiological splitting, not S3 or S4, without murmurs, immediate capillary refill, synchronous pulses, without clubbing, truncal varices in pelvic limbs no ulcers or edema.

Within the diagnostic approach, a chest X-ray is initially performed, evidencing a radiopaque image at the base of the heart in an eggshell pattern, later a transthoracic echocardiogram is performed, where biatrial dilatation, LVEF 31%, E wave variability and ventricular interdependence, annulus are evidenced. reverse, Reverse diastolic flow in suprahepatic veins and vena cava with <50% collapse (Fig. 1), optimal treatment for preserved LVEF heart failure was adjusted without improvement, so surgical treatment based on subtotal pericardiectomy was decided (Fig. 2), which was carried out successfully and without complications, the patient required hospitalization for 4 days after the surgical procedure, starting pulmonary rehabilitation and was discharged with optimal treatment for ambulatory heart failure. Pericardial biopsies were taken, which in the histopathological report showed fibrosis, without evidence of neoplasms, fungal, bacterial, and alcohol-resistant bacilli tests were negative, ruling out the etiology of tuberculosis, being the most common cause. A control transthoracic echocardiogram was performed, showing transmitral flow without E wave variability, normal septal motion, and septal and lateral tissue velocities without reverse annulus (Fig. 3). He is currently being monitored by an outpatient cardiology clinic in NYHA functional class I/IV.

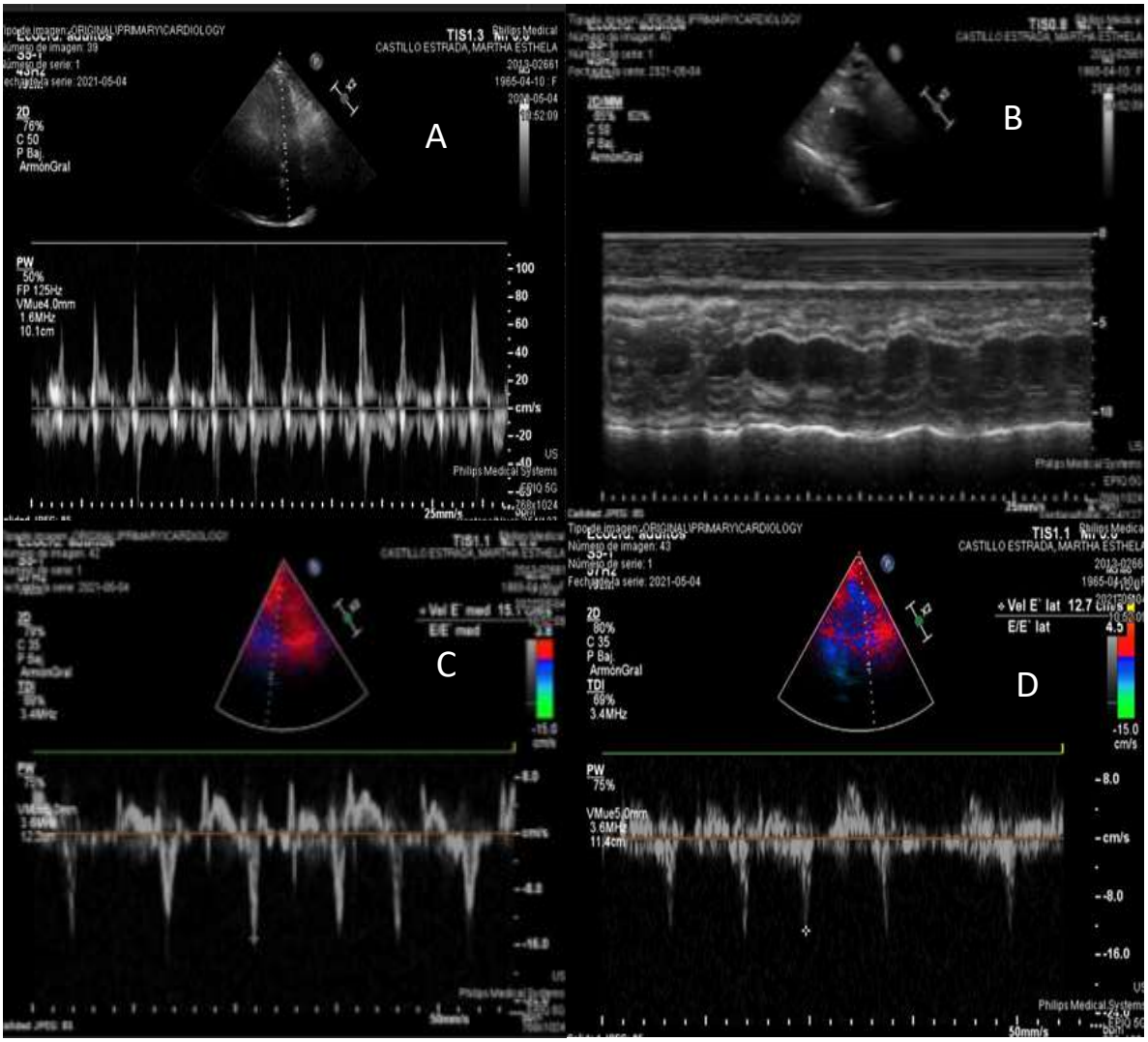


**Fig. 1 Transmitral Doppler showing variation with respiration (A), M mode showing abnormal septal movement (B), tissue Doppler of the lateral ring with E´>12cm/s (Cy D)**

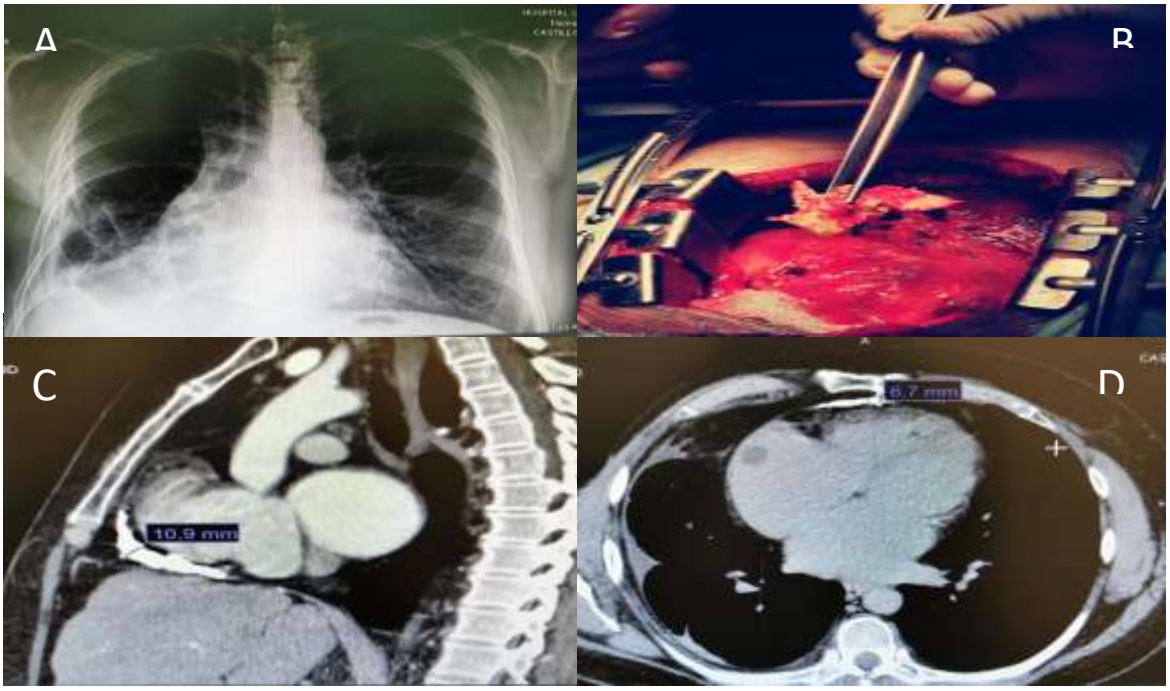


**Fig. 2 Chest X-ray: Pulmonary parenchyma increased parahilar mesh, with pulmonary fibrosis costodiaphragmatic and cardiophrenic arch preserved left and right effaced, ICT .52 grade I cardiomegaly, pericardial calcification (A), Pericardiectomy (B), Chest Computed Axial Tomography. Circumferential thickening of the pericardium (C and D).**

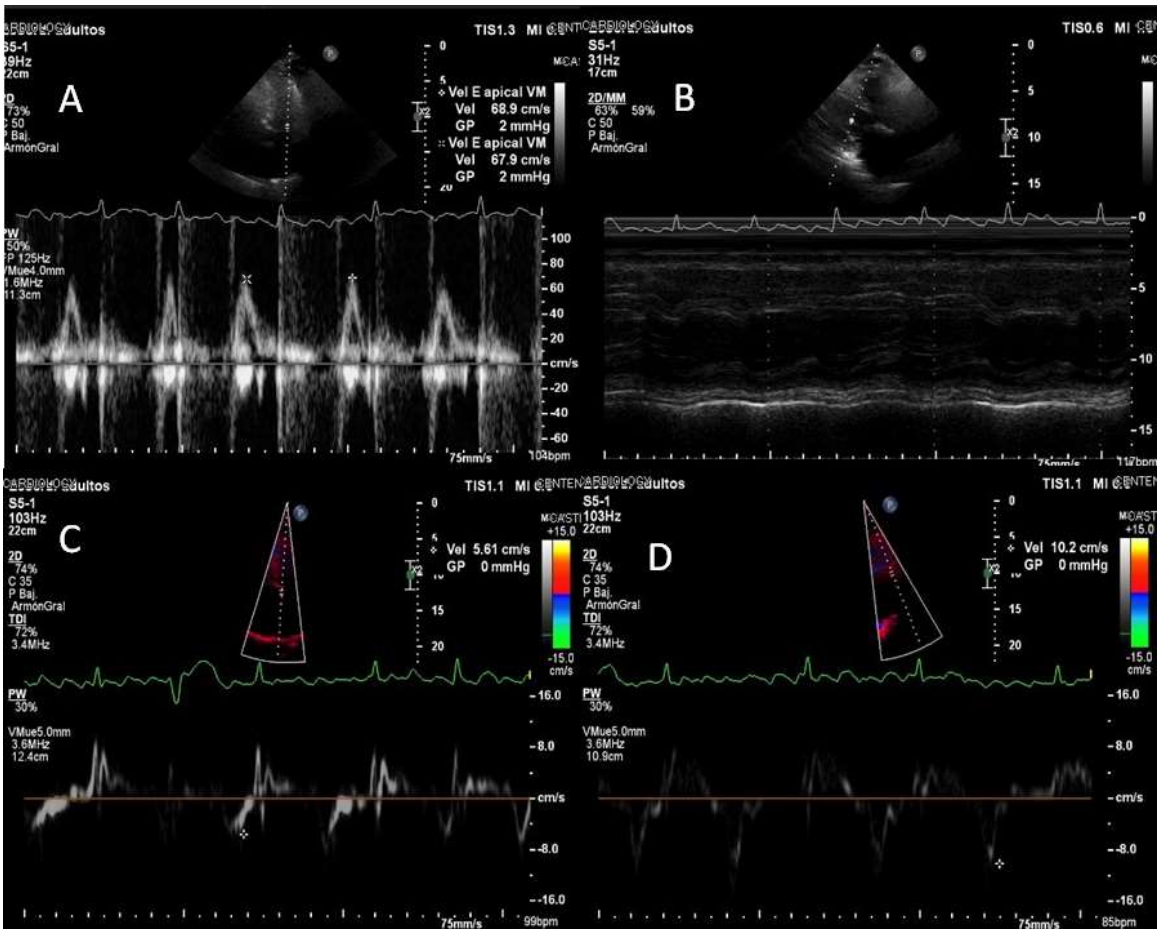


**Fig. 3 Transmitral Doppler without variation with respiration (A), M-mode normal septal motion (B), tissue Doppler of the medial and lateral annulus without reverse annulus (C and D)**

## DISCUSSION

Post-radiation pericarditis is a rare entity and can occur in the first two years after radiotherapy or up to 20 years later. Most of these cases are secondary to targeted radiotherapy in the thorax, either for Hodgkin-type lymphoma or for breast cancer. , as is the case of the patient, this etiology has been decreasing to 0.5% with the reduction of radiation doses in recent decades, this can present with or without pericardial effusion, the first years the patient denies cardiovascular symptoms, however As time goes by, the construction is gradually established and in turn begins to generate hemodynamic changes that will produce cardiac symptoms initially characterized by dyspnea on great exertion, which is progressive until reaching dyspnea at rest, which is the reason of initial consultation.

Post-radiation constrictive pericarditis can occur in up to a third of these patients, and has been related to radiation therapy exposure and dose. Initially, the patient was approached with optimal treatment for heart failure since she did not have an echocardiogram, which did not improve with medical treatment. Subsequently, laboratory studies such as chest x-ray, electrocardiogram, chest tomography, and echocardiogram were requested, which were presented for 5 months. later, however, when observing the results of the chest X-ray with evidence of peripheral calcification and transthoracic echocardiography with the presence of all the typical echocardiographic criteria of constrictive physiology, although it is not common to present all the echocardiographic criteria in this patient, they were found to be present, this depends as much the ability of the echocardiographer and the clinical cardiologist to integrate the diagnosis. This entity can be confused with other diseases of the pericardium, which makes it an underdiagnosed etiology, so it is considered important to know this type of etiology and timely diagnosis would prevent progression of the disease, as well as the development of complications.

Conclusion:

Post-radiation constrictive pericarditis is a rare complication that is underdiagnosed. It is characterized by data of heart failure with decreased functional class, but without decreased ejection fraction and constrictive physiology evidenced by echocardiography. The treatment of choice is surgical by means of a resection of the pericardial sac in order to reduce the pressure. Pericardiectomy should be considered in all patients with chronic constrictive pericarditis or secondary aetiology to radiation. Timely detection has been observed to improve quality of life, morbidity, and mortality.

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