Case report

A rare case of intracardiac metastases revealing chondroblastic osteosarcoma in a 30-year-old girl: About a case

Abstract:

Background: Cardiac metastases are among the rarest in oncology, usually silent and rarely attracting clinical attention, often discovered at autopsy.

Osteosarcoma is the most common malignant bone tumor, and its usual metastatic sites are the lung, bone, brain, soft tissue, and lymph nodes.

Cardiac metastases from osteosarcoma are exceptional.

Case presentation: We report a rare case of cardiac metastases discovered in the presence of progressively worsening dyspnea, which became worse with the slightest effort, prompting transthoracic echocardiography, which revealed two large intracardiac masses located in the right cavities, with extensive thrombosis of the inferior vena cava.

A thoracic-abdominal-pelvic CT scan revealed a right coxo-pelvic mass suggestive of osteosarcoma. Ultrasound-guided biopsy with an anatomopathological study of the mass confirmed the diagnosis of chondroblastic osteosarcoma.

After neoadjuvant chemotherapy and surgical excision of the primary bone tumor and cardiac metastases, the anatomopathological study of the cardiac masses confirmed the same histological nature as the coxo-pelvic tumor. The patient was subsequently referred to the oncology department for neoadjuvant chemotherapy and further management.

Conclusions: Most malignant tumors can metastasize to the heart. In cancer patients, a transthoracic echocardiogram should be performed in the presence of any cardiac warning sign, including dyspnea, chest pain, or a new heart murmur, in order to diagnose any cardiac metastasis that may worsen the patient's prognosis and contribute to the mechanism of death.

keywords:

Cardiac metastases, chondroblastic osteosarcoma, cardiac masses.

ABBREVIATIONS:

CT: Computed tomography

1. INTRODUCTION:

Chondroblastic osteosarcoma is a malignant bone tumor with a dark prognosis, known to be particularly aggressive with high metastatic potential.

It primarily affects adolescents and young adults but can occur at any age.

The most common metastatic sites are the lung, bone, and brain. Cardiac metastases of chondroblastic osteosarcoma are exceptional.

During cardiac metastases, the right cavities are most often affected compared to the left cavities (1). In descending order of frequency, its metastases affect the pericardium, myocardium, and endocardium (2). The partial or total intra-cavitary growth of cardiac metastases is very rare (3).

Metastatic tumors in the heart are generally silent and are very rarely the mode of revelation of the primary tumor (4), however, they are strongly incriminated in the mechanisms of death in patients (2).

Today, transthoracic echocardiography greatly facilitates the detection of heart disease in neoplastic diseases. Diagnostic certainty is provided by pathological examination.

Reporting a rare case of metastatic intracardiac masses revealing chondroblastic osteosarcoma in a 30-year-old woman, with a literature review.

2. CASE PRESENTATION:

We report a case of a 30-year-old ethnic Moroccan woman, without any particular pathological history, who consults in the emergency department for progressive dyspnea becoming increasingly important with a marked limitation of daily activities.

On clinical examination, the patient was eupneic at rest, her blood pressure was 123/68 mm Hg, and her heart rate was 80 beats/min. Cardiopulmonary auscultation normal.

Chest x-ray done shows cardiomegaly with protrusion and hyperconvexity of the right and left lower arcs.

The transthoracic ultrasound made before the finding of the cardiomegaly objective two intracardiac masses located in the right cavities, the first heterogeneous contour fairly regular 20x14 mm, developed at the depends of the right atrium, the second heterogeneous irregular contour measuring 27x22 mm developed at the depends of the right ventricle, associated with thrombosis of the inferior vena cava.

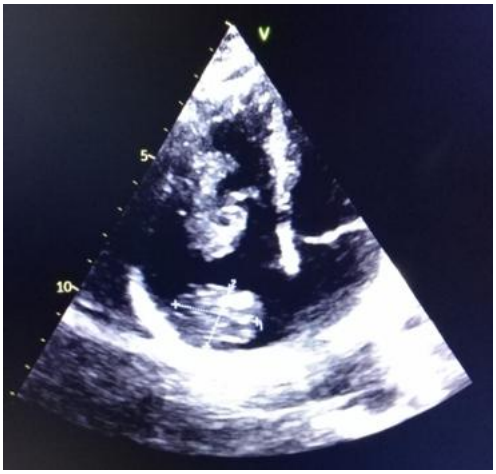

Figure 1: Two intracardiac masses in the dilated right cavities.

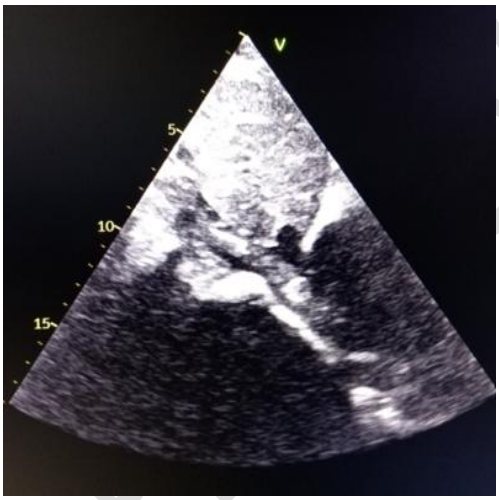

Figure 2: Extensive thrombosis of the inferior vena cava.

The chest angioscan performed did not show any pulmonary embolism.

In view of her highly suspicious intracardiac masses, an abdominopelvic CT scan was carried out in search of primary neoplasia, which revealed a right coxo-pelvic mass with a speckled appearance of the iliac crest and extension to the sacroiliac, suggestive of osteosarcoma.

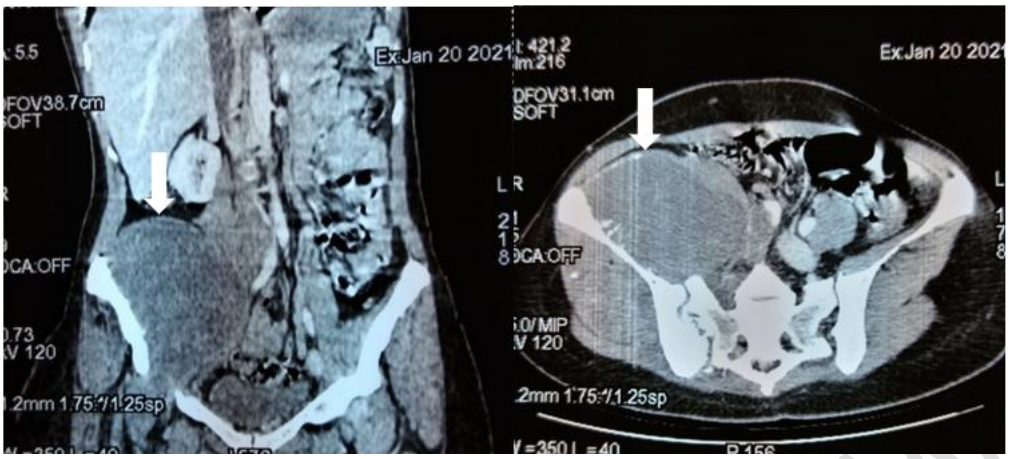

Figure 3: CT image showing a right coxo-pelvic mass with a speckled appearance of the iliac crest and extension to the sacroiliac, suggestive of Osteosarcoma.

An ultrasound-guided biopsy of the coxo-pelvic mass was performed. Anatomopathological study of the mass revealed sarcomatous proliferation in diffuse sheets and nodules with a significant high-grade cartilaginous component, myxoid remodeling, and highly atypical cells surrounded by osteoid substance at the periphery, suggestive of chondroblastic osteosarcoma.

After multidisciplinary consultation, the therapeutic strategy consisted of neoadjuvant chemotherapy with cisplatin, doxorubicin, and ifosfamide, followed by surgical removal of the primary bone tumor and cardiac metastases, given their large size and the risk of obliteration of the heart chambers and embolic dissemination.

Anatomopathological study of the cardiac masses revealed a cellular proliferation of cartilaginous differentiation, made up of ovoid or rounded cells with hyperchromatic nuclei, showing certain patterns of mitosis. These cells elaborate a chondroid substance, confirming the diagnosis of chondroblastic osteosarcoma metastasis.

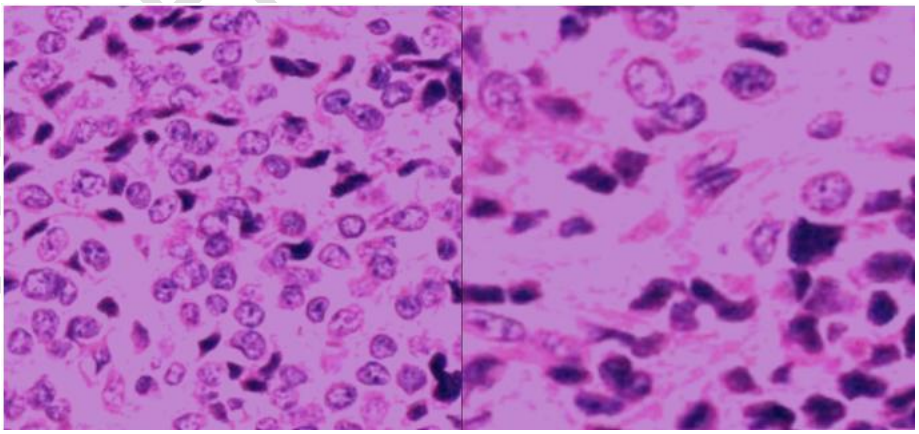

Figure 4: Microscopic appearance of cardiac masses showing sarcomatous proliferation with a cartilaginous component confirming their metastatic nature.

After surgery, the patient was referred to the oncology department for neoadjuvant chemotherapy and further management.

3. DISCUSSION:

Cardiac metastases are 20 to 40 times more frequent than primary cardiac tumors, and their incidence is underestimated: they have been found in 6% of post-mortem patients who died of cancer (5). It is not uncommon for cardiac tumor invasion to be involved in the mechanism of death in affected patients (6).

All malignant tumors can metastasize to the heart, with the exception of central nervous system tumors, which have not been shown to metastasize to the heart. The most common tumors to metastasize to the heart are carcinomas of the lung, breast, and esophagus, malignant lymphomas, leukemias, and malignant melanomas (12).

Cardiac metastases from osteosarcoma are exceptional, with only 63 cases reported in the medical literature up to 2017.

Osteosarcoma is the most common primary bone tumor, followed by chondrosarcoma and Ewing's sarcoma (9-10). It mainly affects adolescents and young adults, although all age groups can be affected.

Preferred metastatic sites for osteosarcoma are lung, bone, brain, and with less frequency, soft tissue and lymph nodes (7). Cardiac metastases of osteosarcoma are exceptional.

Around 15-25% of patients with osteosarcoma have metastases at the time of diagnosis (8), as was the case with our patient.

Metastatic cancer cells may reach the myocardium by direct extension from neighboring organs such as the lung, esophagus, or mediastinum, or by lymphatic or hematogenous routes. Propagation to the heart may also occur via the pulmonary vein or vena cava. In our case, dissemination occurred from the inferior vena cava to the right atrium and then the right ventricle (16).

In order of frequency, cardiac metastases involve the pericardium, myocardium, epicardium, and endocardium. An autopsy study by Butany et al (17), reported that among 193 cases of cardiac metastases, the pericardium was involved in 127 cases (65.8%), the myocardium in 56 cases (29.0%), the epicardium in 48 cases (24.9%) and the endocardium in 6 cases (3.1%). In our patient, the endocardium was the tunica concerned by metastatic dissemination.

In most cases, cardiac metastases are clinically silent. The clinical picture is dominated by generalized tumor spread, with only one-tenth of patients with cardiac neoplastic dissemination presenting with suggestive symptoms (11).

Cardiac metastases are very rarely the revealing feature of the primary neoplasia, being the predominant clinical finding in only a few isolated cases, and may be clinically silent, manifesting themselves clinically only several years after cancer has been diagnosed (11).

The most common telltale signs of cardiac metastases are heart failure, particularly dyspnea, atrial or ventricular rhythm disturbances, conduction disorders, and cardiomegaly due to pericardial effusion.

In the case of our patient, the revealing symptom that motivated the consultation was the dyspnea of progressive aggravation, becoming at the slightest effort.

There is no strong parallelism between the extent of cardiac lesions and clinical manifestations. In many cases, post-mortem findings show more extensive metastatic cardiac involvement than clinical symptomatology would suggest.

In the case of intravenous tumor dissemination through the superior or inferior vena cava, as in our patient's case, a metastatic extension may lead to obstruction of the right atrium or blockage of tricuspid valve mobility, resulting in adiastole. Another major complication is the release of metastatic emboli into the pulmonary circulation.

Endocardial metastases of the left heart also carry the risk of valvular obstruction, with the possibility of systemic embolism in one in ten cases; most often this is a transient ischemic attack or stroke, but metastatic emboli can also affect the arteries of the limbs and, more rarely, the coronary arteries, resulting in acute coronary syndrome (13).

In most cases, treatment of cardiac involvement is limited to palliative measures, with surgical resection indicated only in patients with a relatively good prognosis and intracardiac masses at risk of intracavitary obliteration or valvular obstruction.

Post-operative mortality of complete resection is high, but surgical excision of cardiac metastases invading the right atrium by intravenous means has been performed successfully in a large number of cases (14-15).

4. CONCLUSIONS:

Intracardiac metastases of chondroblastic osteosarcoma are exceptional.

These metastases are usually silent and rarely represent the primary tumor's mode of revelation.

Despite its insidious nature, cardiac neoplastic invasion contributes to the mechanisms of death in cancer patients.

Transthoracic echocardiography can detect cardiac metastatic dissemination and should be performed in the presence of any cardiac warning sign, particularly dyspnea, chest pain, a new heart murmur, a rhythm or conduction disorder, or cardiomegaly on radiology.

DECLARATIONS:

- Ethics approval and consent to participate

This case report was conducted in accordance with the declaration of Helsinki. The collection and evaluation of all protected patient health information was performed in a health insurance portability and accountability Act. we know of no conflicts of interest associated with this publication.

- Consent for publication:

"Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal."

- Availability of data and material: non-applicable

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