A Case of Hip Chondrosarcoma Metastasis to the Right Ventricle

Abstract

Background. While primary cardiac tumors occur rarely, it is observed that cardiac metastases are almost 20 times more common. These are, however, observed during autopsy and seldom missed in living patients. Patients with cardiac metastases present commonly with dyspnea on exertion or pleuritic chest pain. Most common site of intracardiac metastases is right atrium.

Case presentation. Here we present a case of a 21-year-old male who presented for a routine check-up to the cardiac outpatient department for assessment of fitness for chemotherapy. He was a known case of right hip chondrosarcoma for 2 years, being treated with Ayurvedic medications. He had no symptoms related to the respiratory or cardiac system. He was afebrile during the examination, however, was restricted to a bed due to the pain in his right hip. On evaluation, the patient was diagnosed with a right ventricular thrombus extending to the pulmonary artery (PA) causing an impending pulmonary embolism. On opening the right atrium and PA, we found a loose, whitish-grey mass, adherent to the right ventricular papillary muscle, entangling the chordae. The tricuspid valve leaflets were also found to be tethered to this mass. The mass was found to extend to the PA beyond the leaflets, however, the leaflets were free of the tissue. The mass was extracted piece-meal through right atrium and PA approach. Histopathology revealed metastatic chondrosarcoma tissue.

Conclusion. Cardiac metastases of chondrosarcoma are a rare condition, and can be often asymptomatic. Such patients often present with dyspnea, and imaging may not be able to rightly identify the cause. A high index of suspicion is necessary in patients with a known current or prior malignancy before committing to surgical intervention.

Keywords: bone tumors, carcinoma, metastatic complications, dyspnea, hip pain, case report.
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when his right hip pain aggravated, they sought advise at hospital, wherefrom he was referred for assessment of fitness for chemotherapy. He had no symptoms related to the respiratory or cardiac system. There was no family history of malignancy or heart disease. He did not smoke, consume alcohol or chew tobacco. He had not undergone any surgery in the past.

Positron emission tomography (PET) was done prior to referral, which showed disease limited to the right ilium (Fig. 1).

He was afebrile during the examination, however, was restricted to a bed due to the pain in his right hip. There was localized tenderness and rise of temperature in the right hip. Cardiovascular, respiratory and abdominal examination was found to be grossly normal.

Blood parameters revealed anemia with leukocytosis, but the rest of the findings were normal.

2D echocardiography revealed an RV thrombus extending to the pulmonary artery (PA) causing an impending pulmonary embolism. The patient was referred for emergency surgery.

The approach followed was a midline sternotomy, vertical pericardiotomy and aorto-bicaval cannulation. Cardiopulmonary bypass was established and the patient was cooled to 30 degrees centigrade. On external inspection of the heart and pericardium, no gross abnormality was noted. After right atriotomy, we found a loose, whitish-grey mass, adherent to the RV papillary muscle, entangling the chordae (Fig. 2, 3).

The tricuspid valve leaflets were also found to be tethered to this mass. However, it was decided to leave the leaflets as they are.

The mass was found to extend to the PA beyond the leaflets, however, the leaflets were free of the tissue. The mass was extracted piece-meal through right atrium (RA) and PA approach. (Both approaches were used to extract the tumor, from tricuspid valve to pulmonary valve.) In the immediate postoperative period, the patient had serous discharge from the wound and repeated histopathology revealed metastatic chondrosarcoma tissue (Fig. 4). Based on this report, the patient was referred for chemotherapy +/- radiotherapy. However, the patient developed fever on postoperative day 8, and succumbed to the disease in the hospital we referred him to.

Fig. 1. PET scan showing metabolically active lesion in the right iliac bone with localized swelling and inflammation. There is no evidence of metastases in the cardiac system.

Fig. 2. Large, irregular loose mass, whitish-grey, adherent to papillary muscles and chordae.

Fig. 3. Loose mass tethered to tricuspid valve leaflets.
Discussion. Cardiac metastases are uncommon, with RA being the most common site. It is rare for the RV to be involved sparing the RA [1]. Chondrosarcoma of the bone is known to be rare, but it is still the third most common bone tumor [2]. It is locally aggressive in most of its forms, though metastases are rare. Moreover, this is the first case where the patient was asymptomatic and the imaging did not provide the diagnosis.

We need to keep in mind that patients with primary malignancy in any part of the body may develop cardiac metastases. Even the most specific imaging modality may not differentiate between tumor and thrombus, creating an unusual dilemma for surgeons [4]. In the case report presented by Haslinger et al, they faced a similar challenging situation, where patient was suspected to have pulmonary embolism which later intraoperatively was identified as metastases [4]. They suggested that the peripheral rim enhancement is due to the slowed blood flow within the chambers.

In a study by Leung et al [5], progression of primary chondrosarcoma to cardiac metastases took about 2-3 years, with median survival of those with cardiac involvement being 2 months. Other than providing debulking surgery, little can be offered for such patients with extensive involvement of the disease. Adequate pre-operative planning and treatment is necessary to prevent deposits of such tissue and disseminating the tumor tissue through the bloodstream. That being said, this is a life-saving procedure in cases with impending pulmonary embolism [6].

Conclusion. Cardiac metastases of chondrosarcoma are extremely rare, and represent a very late presentation and poor prognosis. Such patients often present with dyspnea, and imaging may not be able to rightly identify the cause. A high index of suspicion is necessary in patients with a known current or prior malignancy before committing to surgical intervention.

References
Опис випадку. Чоловік віком 21 рік звернувся для планового огляду до амбулаторного кардіологічного відділення для визначення можливості проведення хіміотерапії. Він мав підтверджений хондросаркому правого стегна протягом 2 років і отримував лікування аюрведичними засобами. Симптоми з боку дихальної або серцево-судинної системи були відсутні. Під час обстеження він мав нормальну температуру, однак йому було призначено постільний режим через біль у правому стегні. Шляхом обстеження у пацієнта виявлено тромб у правому шлуночку з поширенням у легеневу артерію, що спричинило загрозу тромбоемболії легеневої артерії. Після розтину правого передсердя і легеневої артерії ми виявили пухле біло-сіре новоутворення, що прилягало до папілярного м'яза правого шлуночка, залучивши хорду. Стілки трістулкового клапана також були прикріплені до цього новоутворення. Новустроення поширилось до легеневої артерії за стулками, однак стулки його тканинами уражені не були. Новоутворення було видалено частинами через праве передсердя і легеневу артерію. Гістопатологічне дослідження виявило тканини метастатичної хондросаркоми.

Висновки. Метастази хондросаркоми в серці – рідкісне захворювання, що часто може бути безсимптомним. У таких пацієнтів часто спостерігається задишка, і візуалізація не завжди дозволяє правильно визначити причину. Пацієнти з відомим назвним або попереднім злоякісним новоутворенням потребують високого рівня підозри до проведення хірургічного втручання.

Ключові слова: пухлина кістки, карцинома, метастатичні ускладнення, задишка, біль у стегні, опис випадку.

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