"THE RHYTHM OF CANCER" – UNEXPECTED AUTOPSY FINDING IN A PATIENT WITH GASTRIC ULCERATION

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Abstract. *Malignant tumors of the heart are rare. Even rarer, however, are metastases to the heart from cancers originating from the gastrointestinal tract. This case report involves a 63-year-old patient who presented into the clinic with a gastric ulcer and subsequent haemorrhage, and who died after sudden cardiac arrest. Autopsy revealed a metastatic involvement of the heart muscle from low-grade carcinoma of the stomach, as well as many other organ metastases.*

Key words: *autopsy, cardiac metastases, gastric cancer*

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INTRODUCTION

Heart tumors are a rare group of diseases, most of which are usually benign. Metastatic tumors detected at autopsy, originating from the heart have been reported in about 2% of cases, whereas heart metastases from another primary source are more common [1]. Carcinomas are the most commonly found metastatic heart tumors (lung and mammary carcinoma), followed by sarcomas, leukemias and lymphomas, as well as melanoma [2, 3]. Cardiac metastases from gastric origin are extremely rare. Pericardial metastases are thought to be more common (4.2%), whilst myocardial involvement is observed in only 2.5% of cases [4]. By definition, diagnosis of cardiac metastasis is difficult due to nonspecific and masked clinical findings. Furthermore, the dissemination of the primary tumor can lead to multiple clinical manifestations, of which symptoms of heart disease are not usually the leading ones.

CASE

History of the disease

A 63-year-old patient was admitted to the respiratory clinic with: fatigue, weight loss, decreased appetite, a

pronounced cough and a single episode of hemoptysis. From the examination the patient was in a poor general condition with pale skin and mucous membranes albeit afebrile. Auscultation showed weakened bilateral vesicular breathing with wheezing. The cardiovascular exam revealed dull heart tones, a blood pressure of 140/80 and a heart rate of 100 beats/min. After rectal douching, the patient was transferred to the surgery clinic whilst starting medication, infusions and blood clotting agents. On the fourth night of admission, the patient suffered a sudden cardiac arrest. Cardio-pulmonary resuscitation by protocol was initiated; unfortunately without success.

Instrumental research

Chest radiography showed undefined rounded shadows, suspected lung tumors, of 58/64.5 mm and 13/13 mm, in the right lower and left upper lung fields, respectively. Fibrogastrosocopy was also performed, which showed an ulcer defect with the characteristics of malignant disease.

Autopsy and histological findings

During the autopsy a number of pathological changes were identified. Dissection of the right temporo-occip-

ital region highlighted a lesion of soft consistency and whitish color, with a diameter of 15 mm. On the right paratracheal area a 40 mm diameter tumor formation was found. Dissection of the lungs revealed significant bilateral enlargement which were diffusely compacted, and heavy. In the right lower and left upper lobe, round tumour formations were discovered with diameters of 60 mm and 14 mm, respectively; thick in consistency and whitish in colour. Dissection of the heart showed cardiomegaly weighing 420 g, mainly due to left ventricle hypertrophy. Upon examination of the myocardium two rounded lesions were identified, thick in consistency and with a whitish colour, with diameters of 12 mm and 9 mm (Fig. 1). Numerous similar lesions have been found in the liver, spleen, and the peritoneal surface.

Opening of the stomach along the posterior wall, in the area between the upper and middle part, an ulcer with a 30 mm diameter has been found with uneven edges and a smooth base.

Histological examination showed the presence of low-differentiated carcinoma in the material from the gastric ulcer. All metastatic tumors in the other organs were found to have the same origin (Fig. 2a).

Immunohistochemical studies revealed that tumor cells in all examined metastatic areas were positive for cytokeratin AE1/AE3 and CDX2 (Fig. 2b, c). The other organ changes included different degrees of circulatory and degenerative changes.

DISCUSSION

Cardiac metastases are a rare cause of death in patients with gastric cancer. More often, metastases of this cancer involve the liver (48%), peritoneum (32%) and the lungs (15%). There is a small change in life expectancy of patients with primary vs. metastatic gastric cancer – 3 months and 2 months, respectively [5].

The involvement of the heart from metastatic processes occurs through four pathways: direct invasion of the tumor (most commonly by tumors originating from the mediastinum, lungs, or pleura), hematogenous, lymphogenous and direct intracavitary implantation within the right atrium, from the blood coming from v. cava or pulmonary veins [6]. This also largely explains the rarity of cardiac metastases from malignant tumors of the gastrointestinal tract and, in

Fig. 1 a) and b) Grossly view of metastatic tumor lesions in the left heart ventricle

Fig. 2 a) Metastases from low-grade gastric carcinoma – hematoxylin-eosin (x100); **b)** Metastases from low-grade gastric carcinoma expressing CDX2 (x200); **c)** Metastases from low-grade gastric carcinoma expressing cytokeratin AE1/AE3 (x100)

particular, the stomach. Reviewing the literature, no detailed data on the incidence of metastases in the heart from gastric cancer was found.

In terms of clinical manifestation, very often the involvement of the heart muscle and pericardium remains undetected. The clinical picture of myocardial involvement is mainly determined by which part of the heart is involved. The cases of metastases involving the myocardium of the right atrium and ventricle are between 20-30%, those involving the left atrium and ventricle – 10-33%. In up to 35% of the cases, the metastases spread bilaterally [7]. In our case, two isolated metastatic lesions in the left ventricle were found without any other involvement of the myocardium, pericardium or endocardium.

In patients with clinical manifestations, symptoms of pain, heart failure, rhythmic disturbances, cardiac tamponade, pulmonary embolism and sudden cardiac death are commonly found [8]. Interesting but difficult to diagnose are the cases of isolated pericardial or combined pericardial and myocardial metastases. The clinical picture is severe and includes serous or serous-hemorrhagic pericardial effusions, cardiac tamponade and chronic adhesive pericarditis [9]. When there is myocardial involvement, various manifestations can occur including: atrial or ventricular arrhythmias and conduction disturbances, including atrial fibrillation, atrial flutter, complete AV block, premature ventricular complexes, and ventricular fibrillation with systolic or diastolic dysfunction [9].

Although rare, cardiac metastases do not present a diagnostic difficulty during autopsy. With the help of immunohistochemistry and molecular-biological meth-

ods, these secondary tumors can be easily phenotyped. That provides an explanation for sudden death in patients with oncological disease. Unfortunately, these metastases are often found “at the autopsy table” due to the nonspecific symptoms they cause.

In conclusion, we report an autopsy case of a patient with metastasis to the heart from a low-grade gastric cancer. The patient had a newly discovered cancer, with advanced process and widespread organ dissemination, masking the cardiac pathology and determining a poor prognosis.

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