Primary cardiac tumours are rare, with a reported prevalence of 0.001–0.3% of routine autopsies. More than three-quarters of them are benign, with myxoma as the most common histological type. The malignant primary tumours of the heart are angiosarcomas, rhabdomyosarcoma, osteosarcoma, leiomyosarcoma, undifferentiated sarcoma and primary cardiac lymphoma. The angiosarcoma is an extremely rare neoplasm with a very poor prognosis for recovery because of late diagnosis, aggressive biological behaviour and minimal response to chemotherapy. The mean survival is six to eleven months. We reported two cases treated in the Department of Oncology and Radiotherapy at the University Hospital in Pilsen.

Key words: angiosarcoma, heart, primary tumour, chemotherapy.

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Case report

Rare tumours of the heart – angiosarcomas

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Introduction

Primary tumours of the heart are very rare. Reported prevalence is about 0.001–0.3% of routine autopsies [1, 2]. More than three-quarters of them are benign, with myxoma as the most often histological type. The malignant primary tumours of the heart are angiosarcomas, rhabdomyosarcoma, osteosarcoma, leiomyosarcoma, undifferentiated sarcoma and primary cardiac lymphoma [3]. Angiosarcoma is, with its prevalence 0.000075–0.00225%, the most common of them [4, 5]. The very poor prognosis of this disease is caused by its late diagnosis and treatment because of limited information on the clinical aspects for this type of tumour. The mean overall survival is from 6 to 13 months [5, 6]. Two cases, treated in the Department of Oncology and Radiotherapy at the University Hospital in Pilsen, are presented in this paper.

Case report I

A 65-year-old man was admitted to the internal ward with a suspicion of bronchitis and pericarditis. No fever, weight loss, syncope nor unconsciousness was reported. The patient's medical history was negative for any secondary malignant disease, hypertension, tuberculosis, diabetes mellitus or ischaemic disease of the heart or icterus. His family history also showed no cases of cancer. The physical examination was normal, blood pressure 140/80 mm Hg and heart rate of 90 beats per minute. Electrocardiogram showed normal sinus rhythm with no artefacts. Routine laboratory studies were normal. A chest X-ray showed bilateral fluidothorax. A transthoracic echocardiogram, targeted at pericardial effusion, was carried out. It confirmed fluid in the pericardium. The solid tumour growing from the posterior wall of the right atrium was found as the second finding. About 800 ml of fluid was drained, but because the solid tumour was confirmed by a CT scan, the patient was transferred to the department of cardiosurgery. The patient immediately underwent an open right atrial operation. The tumour of the right atrium was completely removed, sized 35 mm × 20 mm × 6 mm, and the implantation of a pericardial patch was made. Postoperative recovery was without any adverse event or effects and the patient was discharged without any complications. Histological and immunohistochemical examinations were performed. Histologically, the tumour sections showed a poorly differentiated, well vascularized malignant neoplasm with a high marker of nuclear pleomorphism and atypical mitosis. The immunohistochemical stain showed that the tumour cells were positive for CD34, CD31 and fVIII and negative for Aktin S, Myoglobin, S100 and AE 1–3 (Fig. 1). Because of localized disease without any signs of generalization, adjuvant chemotherapy was indicated. The patient underwent 6 cycles of adjuvant chemotherapy monotherapy of doxorubicin with cardio-protective dexrazoxane. At the
four-month follow up, the patient was symptom-free with a complete remission of the disease confirmed by CT-scan. Four months later, a mass of size 80 mm × 50 mm × 140 mm in the wall of the right chamber, expanding in the right hemithorax was found (Fig. 2). Also there were two in the right-lung, five in the liver metastasis and massive packets of mediastinal lymph nodes confirmed. The local progression and dissemination of the disease contraindicated to surgical treatment and the patient’s status did not allow palliative chemotherapy. The patient died due to multi-organ failure 11 months after diagnosis.

Case report II

A 35-year-old woman admitted to the internal ward for dyspnoea. The patient’s medical and family history was negative for malignancy or heart disease. No fever, weight loss, syncope nor unconsciousness was reported. The physical examination showed only dyspnoea at rest, blood pressure 150/90 mm Hg and a heart rate of 85 beats per minute. Electrocardiogram and routine laboratory studies were normal. A chest X-ray confirmed fluidopericard, and after conduction of the pericardial drainage about 1400 ml of fluid was drained. A cytological examination was negative for malignant cells. Transesophageal echocardiography showed a mass in the right atrium, and because of malignancy suspicion a PET-scan was performed. This confirmed a highly vascularized and highly glucose-accumulated tumour in the right atrium, sized 45 mm × 50 mm × 40 mm (Fig. 3). Massive metastatic disease of the lungs and the retroperitoneal area were also found. The patient underwent a cardiosurgical operation to take a biopsy sample and to try a debulking operation, but the local finding was that it was inoperable. Histologically, the tumour sections showed a poorly differentiated malignant neoplasm composed of spindled cells with a high marker of mitosis. The immunohistochemical stain showed that the tumour cells were positive for CD34, CD31, fVIII and desmin and negative for Aktin S, Myoglobin, S100 and AE 1–3 (Fig. 4). The patient’s status was defined as inoperable, so systematic treatment was indicated. The patient underwent 6 cycles of palliative chemotherapy, doxorubicin with cardio-protective dexrazoxane. A PET-scan after the first line of chemotherapy showed no change in metabolic

![Fig. 1. A) Histology (haematoxylin-eosin staining) of a poorly differentiated, well-vascularized malignant angiosarcoma; B) Immunohistochemical positivity for CD34](image1)

![Fig. 2. Thoracic computerized tomography (CT) shows mass in the right atrium expanding in the right hemithorax with fluidothorax](image2)
activity, but partial progression of origin tumour size. The lung metastases reduced their size by one third, but the liver metastases stayed unchanged. Chemotherapy was changed to cisDDP + etoposide. After 4 cycles the chemotherapy had to be changed to etoposide monotherapy due to the poor clinical status of the patient. After the next 3 cycles, a CT-scan was performed. It confirmed progression in size and metabolic activity of the origin and number of metastases in the lung as well as the liver. The local progression, dissemination of the disease and the patient’s status were contraindications to a third line of palliative chemotherapy. The patient died due to multi-organ failure 13 months after diagnosis.

Discussion

Primary cardiac tumour in adults is a very rare diagnosis. Routine autopsy studies confirm the incidence to be about 0.001–0.3% [1, 2]. About 75% of primary heart tumours are benign, with myxoma as the most common histological type. More than a third of the remaining 25% are angiosarcomas [1, 2]. This histologic type is the most common malignant primary heart tumour. The other histological types of malignant tumours are rhabdomyosarcoma, osteosarcoma, leiomyosarcoma, undifferentiated sarcoma and primary cardiac lymphoma [3–5]. Primary angiosarcoma of the heart is common in males and in the 3rd–5th decades of life. About 90% of the tumours arise from the lateral wall of the right atrium [6]. Metastases are found in almost 89% of patients at the time of diagnosis. Primary angiosarcoma of the heart most commonly metastasizes to the lungs and mediastinal lymph nodes, occasionally to bones, liver, brain, pleura and kidney [7, 8]. The clinical diagnosis of this disease is very difficult because of its non-specific signs and symptoms. The main symptoms are, in order, tumour localization, its size, degree of tissue infiltration and the presence of metastasis. Because of the localization of tumours in the right atrium, the first symptoms can be right heart symptoms, vena cava obstruction or cardiac tamponade [9]. The most common symptoms are not so urgent, but also nonspecific such as chest pain, haemoptysis, orthostatic hypotension, emesis, fever, anorexia, dyspnoea or arrhythmia [10]. For the diagnosis of cardiac tumours, echocardiography (transoesophageal or transthoracic) is the modality of choice for the initial evaluation. It is useful to describe the location of the mass and pericardial effusion. For the staging of the disease, CT scan or MRI are usable. It should be noted that the CT scan is less precise to describe a tumour, because of heart movement, while the MRI has more advantages for diagnosis by tissue characterization and the possibility to differ between the blood stream and highly vascularised masses of angiosarcoma [9, 10]. Because of these factors the best way to diagnose the tumour is histology with immunohistochemical staining for CD31, CD34, factor
VIII and vimentin [11]. Therapy of primary angiosarcoma of the heart has the same principles as therapy of sarcomas with a different site of origin. The initial and only method with any possibility to cure this disease is surgery [12, 13]. Complete resection of a tumour is indicated with no signs of dissemination of disease and with resectable local findings [14]. A few case reports also describe heart transplantation as threat possibility [15]. However it’s radical tumour resection, overall survival is weighted by a high incidence of local relapse. After surgical resection adjuvant radiotherapy or chemotherapy is recommended. The final radiotherapy dose range is about 50 Gy. This modality is unfortunately weighted by many difficulties such as inaccuracies with the concentration of the dose of radiation on just the tumour or on the entire site of tumour resection due to movement of the heart. The second major complication is the toxicity of radiation to healthy tissue of critical organs in this location [16, 17]. Chemotherapy could be used as neo/adjuvant or palliative modality. The limited experience caused by the rarity of this disease leads to uncertainty about the efficiency of different drugs. By the known effect on sarcomas from different origin, were used and reported: doxorubicin, cyclophosphamide, ifosfamide, docetaxel, paclitaxel, cisplatin and etoposide [18–20]. The response to chemotherapy is poor and more knowledge about the effect of chemotherapy is weighted by tumour rarity. The same problem complicates obtaining objective data about using multi-kinase inhibitors such as sorafenib or anti-VEGFs such as bevacuzimab [21, 22]. The survival rate for patients with primary angiosarcoma of the heart remains unchanged in the range from 6 to 13 months [21, 23].

In conclusions, our patients confirmed very poor response to adjuvant chemotherapy in angiosarcoma of the heart in palliative treatment.

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References


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