Surgical Dilemmas: Diagnosis and Treatment of Atrial Plasmacytoma

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Treating heart masses demands a well-planned diagnostic strategy. As with any disease in medicine, the confirmation of a diagnosis leads to a tailored, more efficacious treatment. We present the case of a 72-year-old man presenting with a right atrial mass on echocardiography and diagnosis of plasmacytoma after transvenous endomyocardial biopsy.

Comment

We have a relatively extensive experience with surgical resection of cardiac tumors; however, we have encountered less than 5 cardiac plasmacytomas in our practice. Regardless, our diagnostic and surgical approach is dictated by tumor location and type. In this case, the location of the mass in the right atrium allowed for relatively easy biopsy access through a transvenous endomyocardial approach. Once pathology confirmed that the large, obstructive mass was indeed a plasmacytoma, we were able to devise radiation and not surgery, as the best therapeutic regimen for the patient.

This patient with a large right atrial mass was referred to us because of our cardiac tumor program and experience with resecting cardiac sarcomas. In patients with a right atrial mass, we first look at previous imaging to see if the mass “appears” benign. For example, a small and smooth mass with a pedicle, appearing as if it could be “scooped out,” suggests myxoma. If this were the case, we would surgically resect the mass without undergoing preoperative biopsy. For larger masses and those that are questionable, differentiation of tumor from clot is important. This is especially vital when dealing with masses of the right atrium, as clots here are not uncommon. We then employ delayed enhancement CMR to provide gadolinium contrast enhancement patterns of increased capillary perfusion to help study the extent of vascularity of a mass. Typically, tumors have increased perfusion with better contrast enhancement than thrombi. Both recent and chronic thrombi typically demonstrate increased signal intensity on T1-weighted imaging, but do not demonstrate gadolinium contrast enhancement [1].

Once the possibility of clot is ruled out, we biopsy these tumors to see if we are dealing with sarcoma or not. This is done to rule out nonsarcoma malignancies such as lymphoma (or plasmacytoma in this case), which usually entail a nonsurgical approach such as chemotherapy or radiation. If the biopsy reveals a diagnosis of sarcoma, we give neoadjuvant chemotherapy with the hopes of achieving an R0 resection in the near future. Currently in our experience, only approximately 30% of right heart sarcoma resections are R0. We have shown that an R0 resection in right heart sarcoma patients significantly improves survival [2]. It is our hope that by giving neoadjuvant chemotherapy we can shrink right heart sarcomas and improve the R0 resection percentage, and this is currently being evaluated in our...
right heart sarcoma protocol. In this particular case, the patient with past medical history of multiple myeloma presented with a large right atrial mass that was not suggestive of a benign mass. Therefore, our diagnostic algorithm dictated that he undergo preoperative endomyocardial biopsy.

Transvenous endomyocardial biopsy has been reported as a safe procedure that can be easily performed to obtain tissue with less morbidity and mortality than a thoracotomy [3–5]. Guidance with transesophageal echocardiography is currently advised by the American Heart Association, the American College of Cardiology, and the European Society of Cardiology [6]. For our patient, adequate tissue sampling through a transvenous approach did allow for accurate pathologic diagnosis and the formulation of a tailored therapeutic regimen. Clinical complications from endomyocardial biopsy are rare and are estimated to be around 1% to 2% with death occurring 0.2% of the time [7]. The most common complication from endomyocardial biopsy is sampling error and missing pathology that is focal in nature or potentially limited to the left ventricle [8]. Thus, it is important to obtain multiple tissue fragments and strongly consider the clinicopathologic presentation and disease entity.

Once biopsy confirmed the mass was not a sarcoma but instead a plasmacytoma, we began radiation and ruled out the need for chemotherapy or surgery. The patient’s radiation regimen included 5 fractions of 180 cGy during his brief stay in the hospital. He showed prompt improvement clinically and even had a 1-cm reduction in tumor size in about a week. He was breathing well and walking around without any problems, and was discharged with appointments for further radiation.

Transvenous endomyocardial biopsy serves as a safe and effective modality to diagnose cardiac tumor type. Pathologic tumor diagnosis allows for implementation of the most efficacious therapy going forward. In this case, the utility of transvenous endomyocardial biopsy allowed for the diagnosis and optimal treatment of a patient with a large right atrial plasmacytoma.

References

Left Atrial High-Grade Undifferentiated Pleomorphic Sarcoma Protruding Through the Mitral Valve

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Primary cardiac tumors are uncommon. Malignant neoplasms account for 25%, including 75% of cardiac tumors.