Papillary fibroelastomas are small, frond-like, often stalked intracardiac tumors known for their embolic potential. In 1975, while at Armed Forces Institute of Pathology, our colleague Melvin Cheitlin and his group appear to have been the first to publish the term “papillary fibroelastoma” in a case report of an embolic myocardial infarction in the absence of atherosclerosis (1). Since that description, the optimal management of these benign masses, particularly in asymptomatic patients, has been debated, in part because therapy often consists of surgical removal with all its attendant risks, and in part because the rarity of these tumors has provided scant evidence on which to base diagnostic and treatment decisions. There is disagreement regarding the use of the terms “tumor” or “neoplasm” to describe these masses (M. Cheitlin, personal communication, April 2015); for the sake of discussion but not dogma, we will take the position that papillary fibroelastoma is a benign tumor. In doing so, we hope to stimulate discussion that might improve understanding about its appropriate designation in cardiac pathology.

The report of Tamin et al. (2) in this issue of the Journal is welcome as the largest single series of this entity yet reported, although a prior meta-analysis included more cases in total (3). In more than 500 cases of presumed fibroelastoma spanning a 16-year period at the Mayo Clinic, 185 patients had their tumors surgically resected, either as a primary excision (51%) or as an accoutrement to other surgery (49%). These patients are contrasted with the 326 patients whose echocardiograms suggested papillary fibroelastoma, but no surgical resection or pathological examination was performed to confirm the diagnosis.

Roughly one-third (32%) of the surgical group had experienced a transient ischemic attack or stroke. As in prior series (3,4), most tumor-like masses were found on valves, with the aortic valve being the single most common site, and in 98% of the surgical group, the native valve could be preserved. Similarly, in the group that was conservatively managed without surgery, 38% of patients had a previous neurologic event. The reasons for the choice of surgical versus conservative management are not entirely transparent in this report, but we do know that patients who were treated surgically had larger fibroelastomas, on average, than those treated conservatively (9.76 mm vs. 7.57 mm, respectively). As might be expected, papillary fibroelastomas in patients whose presenting symptom was a neurological event were smaller than those in patients who were imaged for other indications and identified incidentally (7.1 mm vs. 8.95 mm, respectively).

The report by Tamin et al. (2) has several lessons for the practicing clinician. First, in this highly-selected referral population, papillary fibroelastoma was actually more prevalent (0.089% of all echocardiograms) than myxoma, generally thought to be the most common primary intracardiac tumor on the basis of autopsy series (5,6). Although selected, this unexpected finding suggests that whereas cardiac tumors as a whole remain rare entities, papillary fibroelastomas may be considerably better represented than previously thought.

Diagnostically, roughly one-half of the cohort underwent both transthoracic echocardiography (TTE) and transesophageal echocardiography (TEE). Of these, approximately one-third of the lesions were...
seen only on TEE. This suggests that routine TTE for other indications likely misses a sizeable proportion of asymptomatic papillary fibroelastomas not linked to neurological or other embolic events. These data also support proceeding to TEE when the clinical index of suspicion for papillary fibroelastoma or other source of embolism is high, even when TTE is negative. This observation also reinforces the designation of fibroelastoma as the most common benign cardiac tumor. Importantly, most fibroelastomas were not associated with valvular dysfunction (82%), and when present, valve dysfunction was usually due to other causes.

However, the heart of this report is in its longer-term follow-up data. Over a median follow-up of 1.6 years, roughly two-thirds of surgical patients had follow-up echocardiogram(s), and evidence of recurrent papillary fibroelastoma was present in 3 patients (1.6%), a finding that has not been previously reported (4). Post-operatively, the risk of stroke in the surgical group was 2% at 1 year and 8% at 5 years, with 10 observed strokes as compared with the expected 4 strokes in age- and sex-matched control subjects. In contrast, in the nonsurgical group (median follow-up 1.7 years), the risk of stroke was 6% and 13% at 1 and 5 years, respectively, with 29 strokes compared with just more than 8 expected strokes on the basis of incidence in matched control subjects. However, almost all patients in the nonsurgical group had other risk factors for stroke, such as hypertension, atrial fibrillation, or atherosclerosis, and data on how many of these events were truly embolic is lacking. Unfortunately, unlike prior reports, echocardiographic features did not predict stroke risk, so imaging, although diagnostically important, could not be effectively used to stratify the patient’s risk for adverse events. A survey of medical therapy in these patients is also reported; there was no significant difference in stroke risk among those treated with anticoagulation, antiplatelet agents, or neither, but the study is likely underpowered to detect a difference.

Direct comparison of the cohort undergoing surgery and those treated conservatively is difficult, as the decision to refer to surgery was at the discretion of the treating physician, and patients who were referred to surgery differed from others on several important features. For example, surgical patients were younger (mean age 63 years vs. 67 years in the nonsurgical group); had a significantly lower incidence of hypertension, prior stroke, previous rheumatic heart disease, prior radiation therapy, or immunosuppression; and had a higher incidence of prior endocarditis. The authors used a sophisticated modeling technique called propensity analysis to try to account for factors associated with surgical intervention. On the basis of their analysis, mortality in the surgical group was lower than in conservatively-managed patients (hazard ratio: 0.68), although this was only statistically significant in a parallel Cox regression analysis. There was no significant difference in mortality between those who underwent surgery primarily for fibroelastoma and those in whom there was another primary surgical indication. However, mortality in those who were referred to surgery primarily for their fibroelastoma was lower than in the nonsurgical group, whereas mortality in those with other primary surgical indications did not differ significantly from that of nonsurgical patients. The risk of stroke, although also elevated above expected levels in the surgical group, was reportedly significantly higher in the conservatively-managed group versus published age- and sex-matched data from the American Heart Association (2,7).

The authors use this analysis, along with the excellent surgical results reported, to propose an aggressive surgical approach to presumed papillary fibroelastoma. First, a thorough workup for other potential entities, such as endocarditis, lupus, or antiphospholipid antibody syndrome, is undertaken. Then, all patients who are surgical candidates in an “expert surgical center” would undergo removal with periodic surveillance for recurrence. Patients who were not surgical candidates or who had increased interventional risks would be treated with antiplatelet agents. One issue, of course, is that despite careful analysis, the data on which this approach is based are prone to referral, verification, and other biases. Also, other centers may not be able to achieve the excellent surgical results in this report. Moreover, validation of such an approach is currently lacking. Therefore, we would agree with Tamin et al. (2) that further data on this issue is needed, particularly in asymptomatic patients and preferably from randomized multicenter trials. Until then, clinicians will continue to assess patients with echocardiographically-diagnosed papillary fibroelastoma on a case-by-case basis, with surgical intervention for those in whom the benefit-risk ratio appears favorable.

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