Atrial myxomas are the most common cardiac neoplasm. They tend to occur with greater frequency in the left atrium. Surgical resection is usually curative. Atrial tachycardias are typically not associated with these tumors, even after their removal. This case describes an unusually large myxoma that altered the atrial substrate, leading to the development of a complex atrial reentrant rhythm. A 35-year-old woman presented with acute dyspnea and episodes of near syncope. A 9-cm right atrial myxoma was diagnosed by transthoracic echocardiography. During surgery, the myxoma was determined to be located in the posterolateral aspect of the right atrium (RA). The tumor size and massive enlargement of the RA were confirmed in addition to observing moderate tricuspid regurgitation (TR). At 1-year follow-up, the patient presented with fatigue and dyspnea on exertion and appeared to be in atrial flutter (AFL). Repeat echocardiography studies determined the RA to be greater than 6 cm in size. Tumor recurrence was excluded; however, TR was now severe. During electrophysiology study, entrainment mapping proved the AFL to be a right-sided rhythm independent of the cavotricuspid isthmus (CTI). A left atrial exit site was excluded by entrainment mapping within the coronary sinus.

Electroanatomic mapping with a non-contact balloon catheter (Ensite Array, St. Jude Medical, St. Paul, MN) demonstrated isochronal activation to be consistent with a figure-of-eight reentry using an isthmus of slowed conduction in the vicinity of the surgical resection. The array's dynamic substrate mapping feature delineated a low-voltage corridor where slow conduction occurred in between two islands of normal voltage. Radiofrequency ablation at this site sequentially eliminated the medial then lateral arm of the tachycardia, converting the rhythm to CTI-dependent AFL. This rhythm was then ablated, restoring sinus rhythm. At 12 months post ablation, the patient remains arrhythmia free and not on antiarrhythmics. Scarring resulting from atrial dilatation and/or surgical removal may create slowly conducting channels responsible for generating complex reentrant tachycardias. Array mapping can help achieve a successful outcome.

References
Figure 2: Presenting electrocardiogram suggests an atrial tachycardia at a cycle length of 280 ms. The pattern is not typical of common atrial flutter with the ectopic P-waves being more concave and not saw-toothed.

Figure 3: Activation mapping with the Ensite Array in a posterior-anterior view illustrates the figure-of-eight pattern transiting through the site of surgical excision. Frame A demonstrates the activation wave front propagating in a lateral to medial direction. A black line connects to islands of higher voltage separated by a channel of lower voltage. In frame B, the wavefront exhibits slower conduction at this site. Note that the tracking virtual at the bottom right of the frame is at peak negative. In frame C, arrows portray splitting of the activation into two propagating waves that ultimately return back to the area of slowed conduction, which is labeled isthmus. The virtual electrograms have a negative polarity. In frame D, the dynamic substrate map highlights the site of successful ablation of the figure-of-eight reentrant rhythm. A voltage gradient exists between two islands of higher voltage (purple) separated by the critical isthmus (light blue), felt to be the anatomic site of myxoma excision.