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## CLINICAL VIGNETTE

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# SVT-Palpitations in a Young Female

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A 32-year-old female presented to cardiology for evaluation of palpitations. She reported intermittent fluttering sensation in her chest for two years. Episodes were less frequent when she was doing more intensive cardiovascular exercise. More recently, symptoms occurred about 3 times a week, lasting up to 2-3 minutes at a time. She has never had syncope or near syncope. The sensations usually subside with vagal maneuvers. She has no other significant past medical history, significant family history and is not on chronic medications. She had been given propranolol in the past but does not use it regularly. She does not smoke or use recreation drugs or herbal supplements. She drinks multiple caffeinated beverages daily.

Vital signs and physical exam are all within normal limits. Labs were notable for a TSH mildly elevated at 5.7, with normal free T4. Her EKG showed normal sinus rhythm at 84 beats per minute without evidence of ventricular pre-excitation. A 14-day heart monitor showed a heart rate was 47-231 bpm. Her average heart rate was 78 beats per minute. She had one symptomatic episode of supraventricular tachycardia (SVT) lasting 2 mins, with a maximum heart rate of 231 bpm. An echocardiogram showed a normal left ventricular ejection fraction of 60-65%. There were no significant valvular abnormalities and the pulmonary artery pressure was normal. A treadmill exercise stress test, revealed ability to exercise 10 mins achieving 11.7 METs, but developed SVT at peak exercise with a heart rate of 214 bpm. She was able to do vagal maneuvers to terminate the arrhythmia.

This patient was referred to a Cardiac Electrophysiologist for further evaluation. She was recommended to have electrophysiological testing (EPS) and radiofrequency (RF) ablation after a discussion of the risks and benefits. The option of continued medical therapy with propranolol as needed was discussed in addition to lifestyle modification with decreased caffeine intake. The patient opted to continue the current management strategy of vagal maneuvers and as needed medication.

### Discussion

Paroxysmal supraventricular tachycardia (PSVT) affects about 0.2-1% of the general U.S population.<sup>1</sup> Excluding atrial fibrillation, the most common PSVT in middle and older ages is AV-node re-entrant tachycardia (AVNRT). Other SVTs include atrial tachycardia and accessory-pathway-mediated PSVT, the latter with a higher prevalence in the younger patients. Patient

with a wide range of ages can present with SVT including pediatric and geriatric cases. However, older age is associated with a higher risk of PSVT in addition to female sex. Symptoms can include palpitations, shortness of breath, chest pain, and lightheadedness. Rarely, PSVT may be incessant and result in tachycardia-mediated cardiomyopathy requiring urgent treatment

Vagal maneuvers may help terminate PSVT depending on the mechanism. These maneuvers are easy to perform and have low risk to the patient. Medical therapy with beta-blockers, and non-dihydropyridine calcium channel blockers may be used first-line taken daily as a preventative strategy. Catheter ablation of SVT can be curative in most cases, but risks and limitations should be discussed with each individual. Ablation in areas surrounding the AV node and penetrating bundle of His have a small risk of conduction system damage and need for permanent pacemaker. This fortunately is very rare, occurring in <1% of modern-day ablation for AVNRT and accessory-pathway mediated re-entrant tachycardia.<sup>1</sup> The generally high success (>93%) and low complication rate (overall 3%, major <1%), of catheter ablation of the most common PSVTs makes it the most favorable approach for most patients. Recurrence may occur in 5-10% of patients after catheter ablation of AVNRT and accessory-pathway mediated PSVT. Risk of AV block and pacemaker implantation with radiofrequency ablation is exceedingly low, ranging from 0.3-0.7% for AVNRT or accessory pathway-mediated SVT.<sup>2</sup> The use of cryo-energy for ablation may provide a lower risk of AV block, but a higher risk of recurrence of SVT.

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