

# Supraventricular Tachycardia in a 20-year old Female Volleyball Athlete: A Case Study

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## Background Information

- Supraventricular tachycardia (SVT) is an abnormality in the electrical circuit in the atria or the atrioventricular node of the heart. <sup>1</sup>
- SVT can develop in healthy population within 2.25 percent per 1,000 people. <sup>1</sup>
- Atrioventricular nodal reentrant tachycardia (AVNRT) is most common in young, healthy females. <sup>4</sup>
- AVNRT is caused by a typical nodal pathway, which reacts slow then fast, or an atypical nodal pathway, which reacts fast then slow. <sup>4</sup>

## Case Presentation

- 20 year old female volleyball athlete complained of heart palpitations during a game and a practice
- Patient experienced cold sweats, an increased blood pressure, and heart rate greater than 230 beats per minute (bpm).
- The patient was referred to a cardiologist for testing.
- The patient wore a heart monitor for 30 days, completed multiple echocardiograms, blood work, and stress tests for a final diagnosis of AVNRT.
- The results of each test presented with a tachycardia abnormality due to an atypical nodal pathway, fast to slow, which is present in 10% of the population.
- The patient was scheduled to undergo an ablation. Prior to the procedure, the patient fasted for 12 hours. Three incisions were then made in the groin incision for catheter insertion through the main artery.
- The procedure mapped the electrical circuit of the heart through an induced tachycardia episode to locate the abnormality in the coronary sinus (CS), midway between the left and right ventricle wall (V-V interval).
- To ensure a successful procedure, a second tachycardia episode was attempted to be induced.

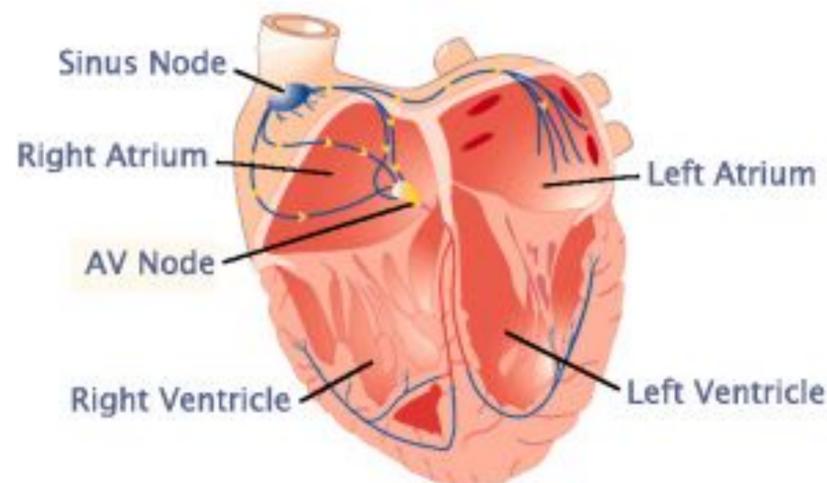


Figure 1: diagram of a electrical circuit of the heart  
Retrieved from <https://emnhealthcare.com/2016/08/29/pacemaker/>

## Diagnostic Imaging

- The patient received echocardiogram, stress tests, and blood work in the winter of 2019.

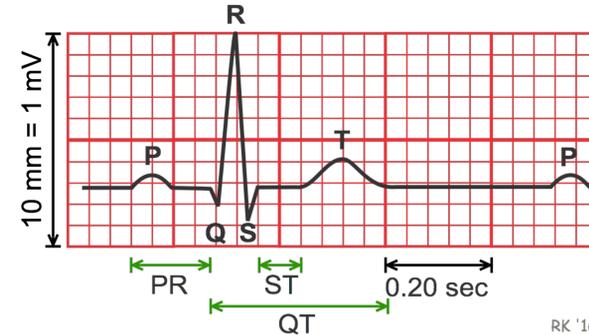
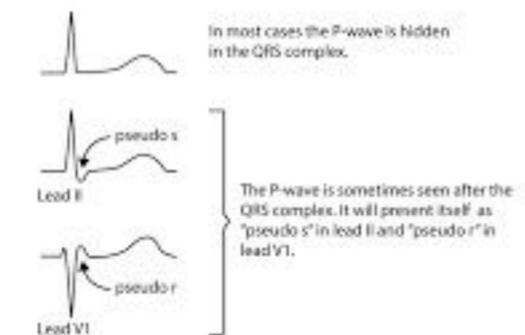
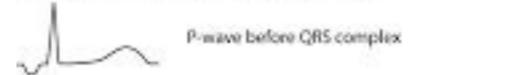


Figure 3: healthy echocardiogram  
Retrieved from <https://cvphysiology.com/Arrhythmias/A009>

### A) Typical AVNRT (slow-fast): 90% of all cases



### B) Atypical AVNRT (fast-slow): 10% of all cases



### C) Very atypical AVNRT (slow-slow): <1% of all cases



Figure 4: AVNRT echocardiogram  
Retrieved from <https://ecgwaves.com/topic/av-atrioventricular-nodal-reentrant-tachyarrhythmia-reentry/>

## Interventions

- Proper recognition and management of vital signs during an episode
- Referral to a cardiologist for further testing
- Ablation of the atypical nodal pathway in the CS

## Conclusion

- All patients with signs and symptoms of SVT warrant a referral to a cardiologist. <sup>1</sup>
- The recognition and assessment of blood pressure, heart rate, and breathing rate warranted further referral for a correct final diagnosis. <sup>4</sup>
- Due to the location of the abnormality, the procedure was extremely precise to avoid damage to the electrical circuit of the heart.

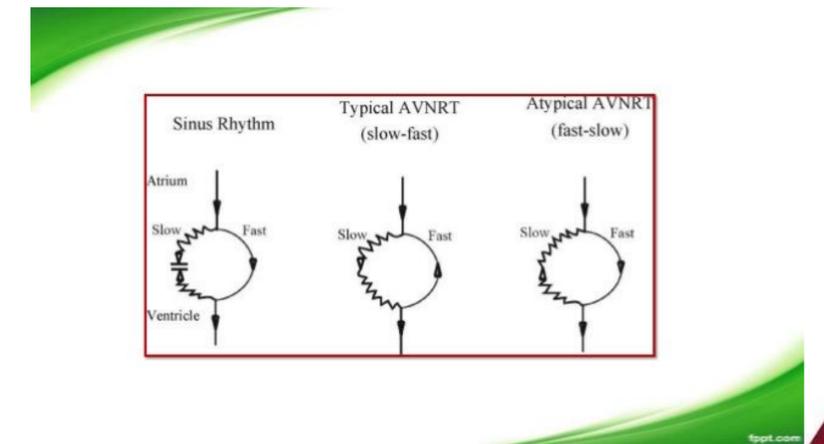


Figure 2: diagram of normal nodal pathway, typical nodal pathway of AVNRT, and atypical nodal pathway of AVNRT  
Retrieved from: <https://www.slideshare.net/tammirajuiragavarapu5/circuits-in-avrtavnrt-itammi-raj>

## Clinical Bottom Line

- Recognition of a tachycardia episode and management of symptoms through emergency medical response is the main priority for an athletic trainer. <sup>3</sup>
- A healthcare provider must recognize the degree of management required for each patient, acute vital management or referral for a catheter ablation. <sup>1</sup>

## References

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