Peertechz

Journal of Cardiovascular Medicine and Cardiology
mail.cardiology@peertechz.com

Medical Group

Journal of Cardiovascular Medicine and Cardiology

ISSN: 2455-2976 DOI CC By

Sonia Mishra[1], Ajay Mishra and Jagdish P Mishra[3]*

[1]Thomas Jefferson University, Philadelphia, PA 19107, USA
[2]Georgetown University, Washington, DC 20057, USA
[3]Rochester General Health, United Memorial Medical Center, Batavia, NY 14020, USA

Dates: Received: 08 April, 2017; **Accepted:** 25 April, 2017; **Published:** 26 April, 2017

***Corresponding author:** Jagdish P Mishra, Rochester General Health, United Memorial Medical Center, Batavia, NY 14020, USA, E-mail: jpmish@gmail.com

https://www.peertechz.com

Case Report

Supraventricular Tachycardia: From Catheter to Catheter Ablation

Abstract

I had a privilege of having a really attentive and good medical student rotating through my cardiology office for a month. One day I explained to her in greater details that in spite of all the tests, devices and everything else, the patient history is still the MOST important aspect of overall medical evaluation of a patient. With this advice, I sent her to go to see a patient of mine admitted to the hospital with palpitations.

Case Presentation

After taking a 'thorough' history, physical examination, she presented the case to me and discussed the differential diagnosis of palpitations and plan of action for the management.

A 56-year-old lady recently diagnosed with stage II breast carcinoma had undergone surgical resection of her breast mass along with some lymph nodes removal. After the surgery, she was advised to undergo a chemotherapy protocol for her ongoing treatment. Two weeks ago, she had completed a course of chemotherapy and thereafter she was on the way to her oncologist's office for follow-up when she started to feel short of breath and palpitations. Symptoms were getting worse and therefore she was advised to go to the local emergency room where she was diagnosed with a supraventricular tachycardia (SVT) (Figure 1,2).

She was treated with intravenous adenosine 6 mg followed by 12 mg and she responded and converted back to normal.

She was admitted overnight for observation and management. Her blood tests were normal and her 2D echocardiographic study was unremarkable. Because of her acute onset of symptoms and abnormal ECG, she underwent CT Chest to rule out pulmonary embolism which was negative.

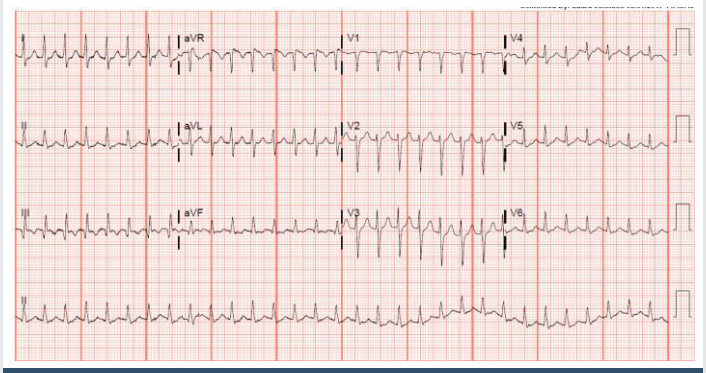

Figure 1: Supraventricular tachycardia with ventricular rate over 170.

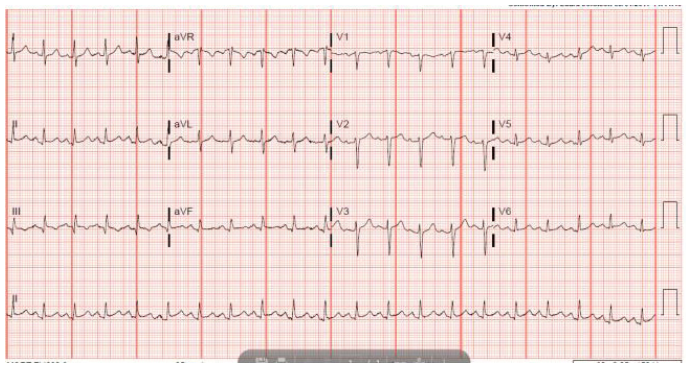

Figure 2: Mild sinus tachycardia after 2 doses of adenosine.

The medical student was very excited to see this patient, get the history and examine her and review all her tests. She read all the possible differential diagnoses of her SVT and possible management options.

Her case presentation and management plan was excellent, however she missed something quite crucial in her history taking and I will come back to that!

Patient came back for follow up a week after her discharge from the hospital. She was on Metoprolol tartrate 25 mg twice a day. She was referred to an Electrophysiologist (EP) for the study and possible catheter ablation.

'One More Thing!'

One aspect of the history that has not been mentioned so

Citation: Sonia M, Ajay M, Jagdish MP (2017) Supraventricular Tachycardia: From Catheter to Catheter Ablation. J Cardiovasc Med Cardiol 4(2): 017-019. DOI: http://doi.org/10.17352/2455-2976.000041

far and the medical student forgot to ask and examine her was that a Mediport catheter had been placed for IV access and chemotherapy 2 weeks prior to her presentation to the ER. Upon further examination of her records from another hospital where a mediport was inserted, the nursing staff had questioned the X-ray report of her catheter placement. It was noted being quite low/deep in the right atrium. The radiologist reported back that he had been placing a catheter like that for so many years to 'avoid any complications.'

Discussion

There are at least two pertinent questions that need to be discussed:

1. Location of a central catheter: superior vena cava or right atrium.

2. Was the placement of the catheter likely cause of her SVT? Both questions and their answers are intertwined.

First human central venous catheter (CVC) was reported by Werner Forssman, a surgical intern who placed a catheter in his own right atrium via the cephalic vein in 1929 [1]. Central catheters are now placed in various clinical settings, ICU/CCU, hemodynamically unstable patients, hemodialysis patients and patients requiring long term IV access including for chemotherapy.

There are various complications reported with a central catheter placement including thrombosis [2,3], perforation [4,5] and arrhythmia [6,7]. Various arrhythmia including premature atrial (PACs) and premature ventricular beats (PVCs), SVT, and VT have been reported from positioning of a catheter tip into the right atrium. Most of the arrhythmia are benign and can be resolved by positioning the guidewire or repositioning the catheter tip.

Delayed cardiac arrhythmia are rare but have been described including PVCs, SVT and VT. As such, there is not a whole lot of literature on this issue of central catheter placement and arrhythmia. In one study, atrial arrhythmia and PVCs occurred with a frequency of 41% and 25% respectively [6]. In another study [8], symptomatic VT was noted in 1% of the hemodialysis patients. Another study reported the incidence of paroxysmal SVT as 2.5 per 1000 adults [9].

Similar findings have been reported in the neonatal and pediatric literature as well [10].

The issue of optimal positioning of the central catheter tip has been at best controversial. The US FDA (Food and Drug Administration) strongly disagrees with the practice of positioning the catheter tip in the right atrium because of the potential cardiac-related complications [11]. Similar position was taken by the Oncology Nursing Society in 1996 [12].

Thereafter the National Association of Vascular Access Networks [13], the Infusion Nurses Society [14], took the similar positions. In 2000, the SCVIR Technology Assessment Committee published the reporting standards and it stated, "The ideal tip location for central venous access catheters has yet to be determined" [15].

As far the management of these arrhythmia is concerned, one could consider vagal maneuvers first and if the SVT is not terminated, IV adenosine or a calcium channel blocker should be tried. Adenosine works most of the time. In case of hemodynamically unstable patients, the ACLS protocol to be followed and cardioversion must be performed immediately [16].

Plan

This patients is scheduled to have an electrophysiologic study soon and likely will undergo a catheter ablation procedure if she is found to have an SVT. Or else the plan is to reposition and withdraw her mediport catheter from the right atrium to the superior vena cava.

Conclusion

Various arrhythmia are reported during and after a central catheter placement. Most of these arrhythmia occur when the tip of the catheter is in the right atrium. Most of these arrhythmia can be managed by withdrawing the guide wire if these arrhythmia happen during the procedure or repositioning the catheter into lower part of SVC if the arrhythmia take place later. If needed, vagal maneuvers, adenosine or calcium channel blockers are to be considered for their management.

References

1. Altman LK (1987) Who Goes First: The story of self-experimentation in medicine. Link: https://goo.gl/idRsaH

2. Ducatman BS, McMichan JC, Edwards, WD (1985) Catheter-induced lesions of the right side of the heart: one-year prospective study of 141 autopsies. JAMA 253: 791-795. Link: https://goo.gl/sy9hNx

3. Kung SC, Aravind B, Morse S, Larry E Jacobs, Rasib Raja (2001) Tunneled catheter associated atrial thrombi: successful treatment with chronic anticoagulation. Hemodial Int 5: 32-36. Link: https://goo.gl/x4PcjJ

4. Robinson JF, Robinson WA, Cohn A, Garg K, Armstrong JD (1995) Perforation of the great vessels during central line placement. Arch Intern Med 155: 1225-1228. Link: https://goo.gl/9tlqCV

5. Kalen V, Medige TA, Rinsky LA (1991) Pericardial tamponade secondary to perforation by central venous catheters in orthopedic patients. J Bone Joint Surg Am 73: 1503-1506. Link: https://goo.gl/oCjBrf

6. Stuart RK, Shikora SA, Akerman P, Lowell JA, Baxter JK, et al. (1990) Incidence of arrhythmia with central venous catheter insertion and exchange. JPEN J Parenter Enteral Nutr 14: 152-155. Link: https://goo.gl/lVHD9d

7. Smith SL, Albin MS, Ritter RR, Bunegin L (1984) Catheter placement from antecubital veins using a J-wire catheter guide. Anesthesiology 60: 238-240. Link: https://goo.gl/tlZXAm

8. McDowell DE, MOss AH, Vasilakis C, Bell R, Pillai L (1993) Percutaneously placed dual-lumen silicone catheters for long-term hemodialysis. AmvJ Surg 59: 568-573. Link: https://goo.gl/Fv86Mj

9. Verdino RJ, Pacifico DS, Tracy CM (1996) SVT precipitated by a peripherally inserted central catheter. Journal of Electrocardiology 29: 69-72.

10. Amer A, Broadbent RS, Edmunds L, Benjamin JW (2016) Central venous catheter-related tachycardia in the newborn. Case Reports in Medicine 2016: 4. Link: https://goo.gl/KaD5xg

Citation: Sonia M, Ajay M, Jagdish MP (2017) Supraventricular Tachycardia: From Catheter to Catheter Ablation. J Cardiovasc Med Cardiol 4(2): 017-019. DOI: http://doi.org/10.17352/2455-2976.000041

11. Food and Drug Administration (1989) Precautions necessary with central venous catheters. FDA Task Force. FDA Drug Bulletin 19: 15-16. Link: https://goo.gl/oVFcAZ

12. Oncology Nursing Society (1996) Access Device Guidelines: Recommendations for Nursing Practice and Education. Pittsburgh, PA: Oncology Nursing Press. Link: https://goo.gl/4R9Clj

13. National Association of Vascular Access Networks (1998) NAVAN position statement. J Vasc Access Devices 3: 8-10.

14. Infusion Nurses Society (2000) Standards of practice. J Intrav Nurs 23: 6S. Link: https://goo.gl/Thm1on

15. Silberzweig JE, Sacks D, Khorsandi AS, Bakal CW (2000) Reporting standards for central venous access. J Vasc Interv Radiol 11: 391-400. Link: https://goo.gl/YSLF5o

16. ACLS 2017 Guidelines; AHA 2015 ACLS Recommendations, Circulation 2015.

Citation: Sonia M, Ajay M, Jagdish MP (2017) Supraventricular Tachycardia: From Catheter to Catheter Ablation. J Cardiovasc Med Cardiol 4(2): 017-019. DOI: http://doi.org/10.17352/2455-2976.000041