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Successful percutaneous retrieval of unusually knotted temporary pacemaker lead



Jaywant M. Nawale, Sandip N. Patil, Digvijay D. Nalawade*, Nikhil A. Borikar, Bhushan S. Sonawane, Ajay S. Chaurasia

Department of Cardiology, TNMC & BYL NAIK Ch. Hospital Mumbai, India

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ABSTRACT

Implantation of temporary pacemaker lead is commonly performed procedure and is usually safe, but can sometimes develop rare and serious complication like intracardiac lead knotting which may require challenging retrieval techniques. We report a case of successful percutaneous retrieval of unusually knotted right internal jugular venous temporary pacing lead via left femoral transvenous approach using snare over a long sheath after cutting the electrode proximally and thus avoiding any surgical intervention.

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1. Case report

A 58 year old gentleman presented with exertional dyspnea since 3 months and presyncope since 7 days. His electrocardiogram showed complete heart block with ventricular rate of 34 beats per minute. 2-D Echocardiography revealed dilated cardiomyopathy with severe left ventricular systolic dysfunction. His routine blood investigations were normal. He was diagnosed as a case of dilated cardiomyopathy with degenerative complete heart block with congestive cardiac failure and received heart failure treatment with temporary transvenous pacing via right internal jugular route at another hospital. Initially he was stable but after few days there was loss of pacing spikes on ECG. Hence a chest x-ray was done which revealed an unusually knotted pacing lead. So he was referred to our institute where another transvenous temporary pacing lead was inserted via right femoral route. The knotted jugular pacing lead was switched off and patient was initially stabilized with medications.

After few days the retrieval of knotted lead was planned. Tip of

knotted lead was lying in right atrium (Fig. 1). Initial strategy to try to untie the knot by holding its distal end with help of snare and manipulate using proximal end, was unsuccessful. Thereafter a 14 Fr long sheath (Evolution, Cook Medical) with dilator was introduced via left femoral vein. After removal of dilator a 25 mm x 150 cm loop retrieval snare (Needle's Eye Snare, Cook Medical) was introduced through it. Tip of knotted lead was securely grasped with help of snare (Fig. 2) and entire assembly was pulled back till the knot hitched at the tip of long sheath. Then proximal external portion of the jugular pacing lead was cut and thoroughly cleansed with sterile normal saline. Entire assembly was gently pulled back and removed into the long sheath, making the knot increasingly smaller and facilitating complete extraction. The procedure was completed without any need for venotomy.

2. Discussion

Intracardiac knotting of temporary pacing lead is an infrequent complication. Knotting can also occur with various other devices like cardiac catheters, especially pulmonary artery catheter, guidewires etc [1]. Temporary pacing lead is usually made up of non-braided radiopaque polymer without central lumen which increases its stiffness and generally prevents kinking as compared to conventional lumen catheters which are thin walled and soft. Even then knotting can occur with pacing leads especially due to

* Corresponding author. 18-ICCU, Department of Cardiology, Ground Floor, OPD Building, Nair Hospital, Mumbai Central, Mumbai 400008, India.

E-mail address: nalawadedigu@gmail.com (D.D. Nalawade).

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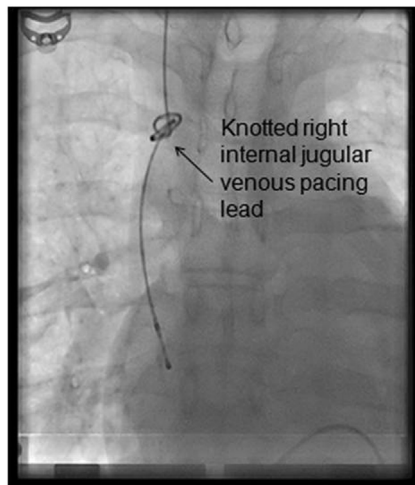


Fig. 1. Cine image showing knotted right internal jugular venous pacing lead with lead tip in right atrium.

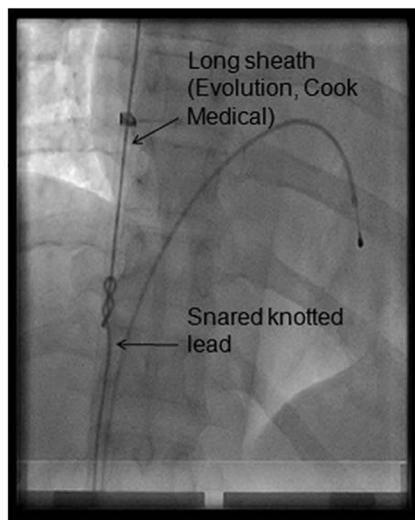


Fig. 2. Cine image showing pull back of snared knotted lead into long sheath (Evolution, Cook Medical).

excessive manipulation and blind insertion without fluoroscopy done in emergency scenarios, which might be the cause in our case.

Most knots can be untied percutaneously using simple maneuvers, especially in case of lumen catheters where insertion of a guidewire through the catheter's central lumen would often help to unravel the knot [1–4]. Unlooping of knot, by passing a guidewire through the loop followed by balloon dilatation [5,6] or hooking and pulling it with a pigtail catheter [1] or 0.035" J tipped guide wire [7] is also described. However in our case, absence of central lumen, lead stiffness and knot complexity made its retrieval more difficult than lumen catheters and required special techniques. One

approach described is to untie the knot by holding its distal end with help of snare and tugging it back and forth by simultaneously holding its proximal end [1], which was tried, but unsuccessful. Another approach is to tighten the knot as much as possible and remove it through vein of insertion, but this required venotomy [1,3]. So the strategy used in our case was to make the knot smaller in size by pulling it with snare into a longer sheath and withdrawing both together through an alternate venous access site after cutting the lead's proximal end. Other methods which can be used are use of retrieval basket, endomyocardial biopsy forceps etc. [1,3] Surgical removal may be required especially if knot is large in size with many loops or develops intracardiac fixation.

3. Conclusion

Knotted temporary pacing lead though a rare complication can be easily prevented by continuous visual control of lead during insertion under fluoroscopy, avoiding excessive length insertion and preventing forceful insertion against resistance. Such knotted lead can be successfully retrieved percutaneously by reducing the knot size by pulling its distal end with snare into a long sheath & withdrawing the whole assembly after cutting its proximal end and thus avoiding any surgical intervention.

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Conflicts of interest

Authors declare no conflict of interests for this article.

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