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Mini Review

Complete Atrioventricular Block During the Placement of a Central Jugular Tunneled Catheter for Hemodialysis at The University Clinical Hospital of Santiago De Compostela, Spain

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Abstract

The central venous access is one of the most common procedures in interventional nephrology [1-3]. One of the known complications of this procedure is the right branch lesion of the His bundle that leads to temporary or permanent blockage. This may go clinically unnoticed in some patients, but in others, especially with previous blockage of the left branch, it might lead to a complete atrioventricular block (AVB), placing the patient at risk [4,5]. We present a case of a 70-year-old patient with chronic kidney disease (CKD) stage G5A3 who, after an attempt of placing a right jugular tunneled catheter for hemodialysis, developed a complete atrioventricular block (AVB).

Clinical Case

A 70-year-old woman with chronic kidney disease (CKD) stage G5 with a stage 3 albuminuria of multifactorial origin was followed up in our CKD unit; she was on the "surgical list" of Vascular Surgery, waiting for a vascular access intervention.

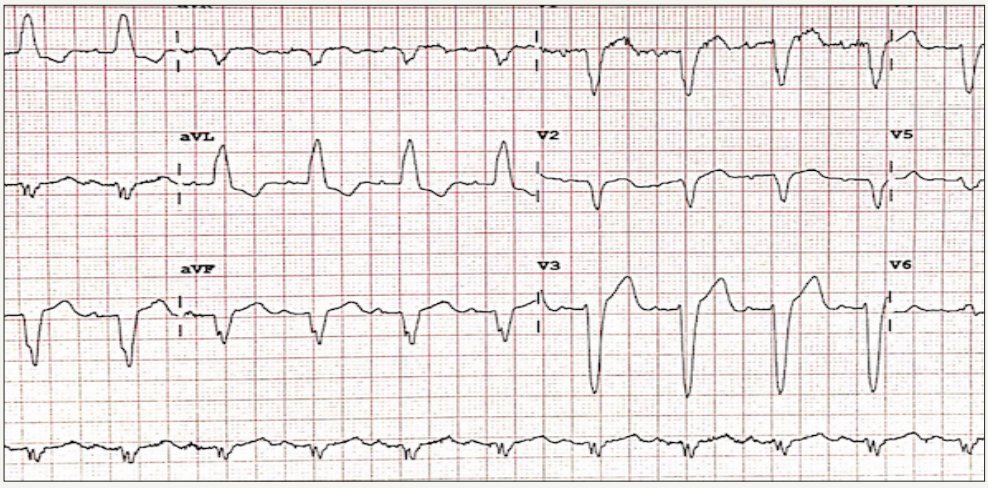

Figure 1: Left bundle branch block, prior to a tunneled jugular venous catheter placement.

Among the personal history: type I obesity, long term hypertension, asymptomatic block of a left branch (Figure 1). Type 2 diabetes mellitus, hyperlipidemia, hyperuricemia with gout crisis, chronic ischemia of the lower limb, multiple biliary lithialsis, diverticles in the descending colon and sigma. Complicated cyst in right kidney, high grade non-Hodgkin lymphoma diagnosed in 1992 in prolonged remission compatible with cure; Autologous bone marrow transplant in 1993. Intervention of cataracts in 1997. Admission in gynecology for hysterectomy and double adnexectomy in 2001 due to an adenocarcinoma on endometrial

polyp. Admission in internal medicine in May 2008th for preseptal facial cellulitis and later in May 2016th for a congestive heart failure with a normal echocardiogram for the patients age, respiratory infection with partial respiratory failure and probable left parahilar pneumonia. The usual treatment consisted of: Aranesp 30msg every 21 days, torasemide 5mg (1-0-1), trajenta 5mg (1-1-0), amlodipine 5mg (1-0-0), carduran neo 4mg (0-0-1), simvastatin 20mg (0-0-1), alopurinol 100mg (0-0-1 / 2), ferrogradument 105mg (1-0-1), hidroferol 0.266mg every 15 days, fosrenol 750mg (1-1 -1), serc 8mg (1-1-1), bicarbonate 1gr. (1-1-0).

The patient initiates hemodialysis on 30/05/2016. Previously on 25/05/2016th a tunneled central catheter was placed in the right innominate vein. Adequate antiseptic measures were taken, and the patient was monitored at all times. Under ultrasound control, after introducing 20cm of the guide, the patient presents hypotension and bradycardia, and a complete atrioventricular block with a heart rate of 30bpm detected in ECG (Figure 2), after administering atropine, without any response, it is transferred to the intensive care unit placing an external pacemaker. After 24 hours, the patient recovered the base rhythm. Given his cardiological history, it was later decided to place a definitive pacemaker.

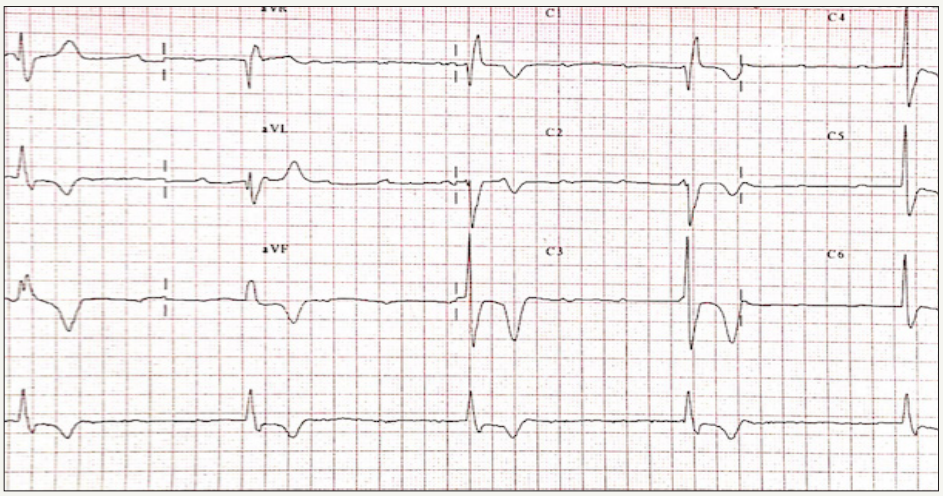

Figure 2: Complete atrioventricular block when placing a central venous catheter, requiring an urgent pacemaker placement.

Conclusion

The right bundle branch block occurs during central line canalization with an approximate incidence of 3-12%, usually caused by direct mechanical trauma of the metal guide on the right branch that is very superficial, while the left branch is deeper in the myocardial tissue [4]. This may go unnoticed except in cases in which there is a previous blockage of the left branch, like this case, which with the induction of the right block leads to complete atrioventricular stop, implying an important vital risk for the patient. The blockage of the right branch in this sort of procedures is usually transient, and lasts less than 24 hours [6,7], with no clinical repercussion. These complications can be avoided by introducing the guidewire from the superior vena cava to the inferior vena cava to avoid the erroneous introduction of the guidewire or "roll up" within the ventricle and therefore, causing damage to the endocardium [8]. This technique requires fluoroscopy monitoring. Another way to avoid incorrect introduction of the guide is to enter the necessary length for safety. Studies conducted in search of the correct length showed that the average distance between the entry point and the junction of the superior cava-atrium is 18 cm, although this must be personalized according to each patient [9,10]. Although an AV block is not a frequent complication during the placement of the right jugular central venous catheter, patients with a cardiovascular history deserve special care, especially if there is a known left bundle branch block, as it was in this case.

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