

Temporary transvenous cardiac pacing in patient with thoracic outlet syndrome technical difficulties

Trudności techniczne w uzyskaniu prawidłowej czasowej stymulacji przezżyłnej u pacjenta z zespołem ciasnoty górnego otworu klatki piersiowej

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Abstract

Thoracic outlet syndrome (TOS) is a group of clinical symptoms caused by pressure on the vascular-nerve structures, passing through the upper thoracic opening. The etiology of this syndrome has many causes, congenital, traumatic and functionally acquired. We presented a patient with bradycardia, who had a problem during implanting an endocavitary electrode from the access through the right subclavian vein. There was a possibility of functionally acquired, age-related cervical spine abnormalities and incorrect position of the neck. In similar cases, when TOS is suspected, accessing the vessels in the upper thoracic opening might be problematic and other vascular access should be considered.

Key words: temporary cardiac pacing, COVID-19, thoracic outlet syndrome

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An 84-year-old man with a history of arterial hypertension, ischemic heart disease, paroxysmal atrial fibrillation (without anticoagulant therapy), a stenotic syndrome, prostate enlargement – admitted due to escape junctional rhythm with a frequency of 35/min with left anterior fascicular block, confirmed on the electrocardiogram (Figure 1A) On admission, coronavirus disease 2019 (COVID-19) infection was detected using Abbott antigen test. The patient was isolated and qualified for a temporary venous stimulation. An endocavitary electrode was implanted from the access through the right subclavian vein under the control of the intracardiac. Correct VVI stimulation was recorded. A routine chest X-ray was performed (Figure 1B). Patient started getting uneasy and aggressive despite receiving midazolam. He removed the electrode along with the vascular sheath.

Despite another attempt, the electrode could not be inserted into the right subclavian vein. Another radiograph was taken. It showed the sheath was strongly folded to electrodes (Figure 1C). During the attempt to remove the sheath, strong resistance was encountered. The cannula was removed by direct traction when the shoulder was abducted towards the head. Then, an endocavitary electrode was implanted through the right femoral vein. On the second day of stay, the stimulating system was implanted. In the performed computed tomography and X-ray imaging examinations of the chest without complications of the procedure (Figure 1D–E). The patient was transferred for further treatment to the COVID-19 hospital. Hemodynamically significant bradycardia necessitates implantation of the electrodes for temporary stimulation and COVID-19 creates severe difficulties

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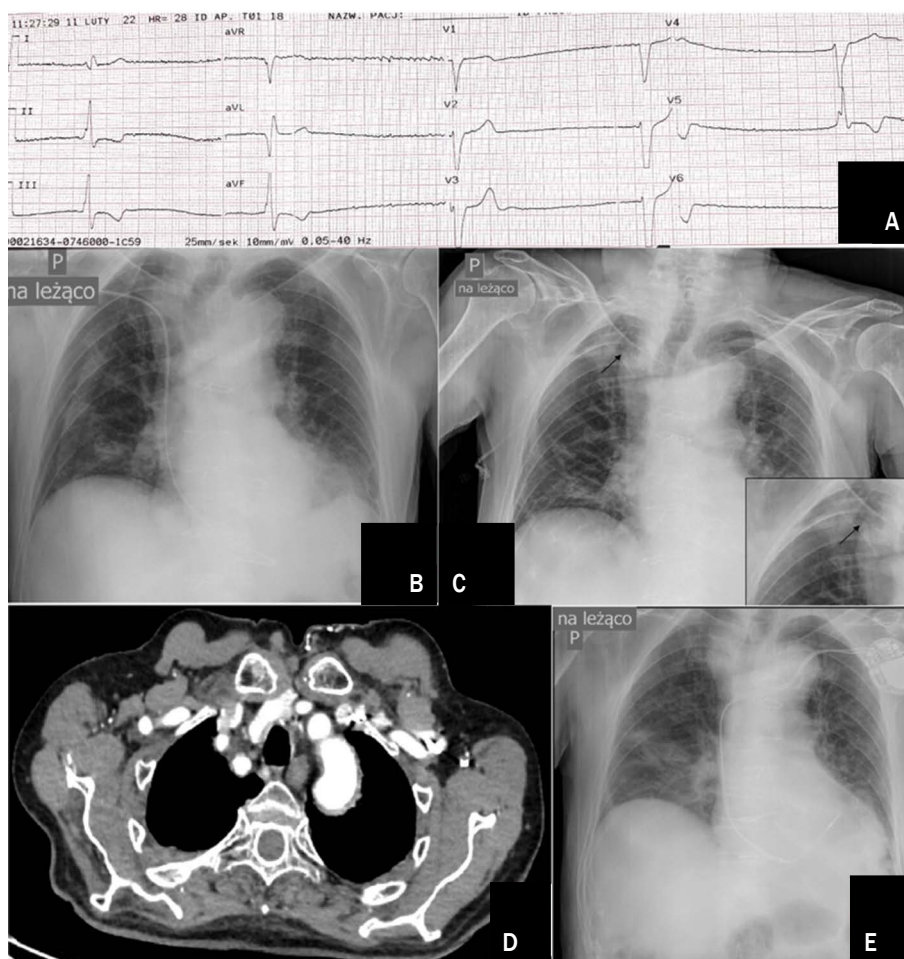


Figure 1. A. The electrocardiogram made on admission. Junctional rhythm with a frequency of 35/min with left anterior fascicular block; B. Chest X-ray performed after correct implantation of a temporary pacing electrode on the right subclavian approach; C. Chest X-ray performed after another attempt to gain access on the right subclavian approach- the photo shows a strong bend of the sheath; D. and E. Chest computed tomography scan at vascular level after pacing system implantation

in managing and securing the patient with temporary stimulation. Some authors present cases where pharmacotherapy is used to avoid temporary stimulation [1]. However, in this particular case due to the advanced, symptomatic bradycardia, pharmacotherapy was not attempted. In the presented case the reason for the difficulties in implanting the endocavitary electrode was the tightness between the clavicle and the first rib, which may appear as a thoracic outlet syndrome (TOS). It is a group of clinical symptoms caused by pressure on the vascular-nerve structures, passing through the upper thoracic opening. Classification of this syndrome is based on the pathophysiology of symptoms with subgroups consisting of neurogenic (nTOS), venous (vTOS), and arterial (aTOS) etiologies. The definition (TOS) was first used by R.M. Peet in 1956 [2]. The occurrence of the syndrome is 3–80/1000 [3]. A long asymptomatic period is observed in some patients [4]. The provocative physical exam maneuvers, helpful in suspecting this syndrome, were not performed on our patient due to the general

condition. In this specific case, there was a possibility of functionally acquired, age-related cervical spine abnormalities, abnormal tension in the muscular apparatus, and incorrect position of the neck, which could have a direct impact on problems with accessing the right subclavian vein. For this reason, it was decided to implantation of a temporary pacing electrode from the femoral approach, which is a safe alternative [5]. The above description indicates that if TOS is suspected, accessing the vessels in the upper thoracic opening might be problematic and other vascular access should be considered.

Conflict of interest

The authors declare no conflict of interest.

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Streszczenie

Zespół ciasnoty górnego otworu klatki piersiowej (TOS) to grupa objawów klinicznych spowodowanych uciskiem struktur naczyniowo-nerwowych przechodzących przez górny otwór klatki piersiowej. Zespół ten może mieć różną etiologię, w tym przyczyny wrodzone, urazowe i czynnościowe. Przedstawiamy pacjenta z bradykardią, u którego wystąpiły problemy podczas implantacji elektrody endokawitarnej z dostępu przez prawą żyłę podobojczykową. Wysłano podejrzenie czynnościowych, związanych z wiekiem nieprawidłowości kręgosłupa szyjnego i związanego z tym nieprawidłowego ustawienia szyi. W podobnych przypadkach, kiedy podejrzewa się TOS, uzyskanie dostępu naczyniowego przez górny otwór klatki piersiowej może być problematyczne i należy rozważyć inną drogę dostępu naczyniowego.

Słowa kluczowe: czasowa stymulacja przezżylna, COVID-19, zespół ciasnoty górnego otworu klatki piersiowej

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