

# Brugada electrocardiography pattern caused by Taxus poisoning

Elektrokardiograficzny obraz zespołu Brugadów w przebiegu zatrucia cisem pospolitym

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A 55-year-old woman was referred to our department due to suspicion of acute coronary syndrome and concomitant ventricular arrhythmias. She negated chest pains but complained of severe fatigue and nausea, and she vomited greenish matter. She did not admit taking any drugs or toxic compounds. Her blood pressure was 100/60 mm Hg, and alternating slow and fast heart rhythms could be detected — physical examination was otherwise unremarkable. On electrocardiogram (ECG), the predominant heart rhythm was sinus bradycardia at a rate of 45 bpm with first-degree atrio-ventricular block (PR 440 ms) and atypical right bundle-branch block — the QRS complexes were extremely prolonged (QRS 280 ms) and almost fused with T waves (Fig. 1). Occasionally, the ECG morphology resembled Brugada pattern with down-sloping ST segment elevation and T-wave inversion in leads V<sub>1</sub> and V<sub>2</sub>, and then the ventricular tachycardia appeared (Fig. 2). Laboratory test results were unremarkable except for a high white blood cell count. Echocardiography showed moderate left ventricular contraction dysfunction with an ejection fraction of 40%. Due to severe bradycardia and signs of developing shock, endocavitary cardiac stimulation and catecholamine infusion were initiated. The toxicological analysis did not reveal opiates, benzodiazepines, tricyclic antidepressants, or digoxin in the patient's blood. During the following hours respiratory insufficiency and deep shock with anuria developed, which required intubation, mechanical ventilation, intra-aortic balloon pumping, and haemodiafiltration. In the meantime, the patient's family found a goodbye letter in which the patient had declared her intent to commit suicide — analysis of patient's computer files revealed that she had been especially interested in the toxicity of yew (*Taxus baccata*). Despite the intensive therapy, the patient died due to electromechanical dissociation 22 h after admission. Post-mortem toxicological examination, with the method of high-performance liquid chromatography/electrospray ionisation tandem mass spectrometry, revealed the presence of taxine B and isotaxine B (the main pseudo-alkaloids of *Taxus baccata*). The toxicity of yew has been known since antiquity; the ingestion of only 50 leaves may be life threatening. The yew alkaloids are quickly absorbed and metabolised in the liver. Their metabolites are excreted by the kidneys, but due to the large volume of distribution, methods of extracorporeal elimination are ineffective. The toxins mainly inhibit the cardiac calcium channel (I<sub>Ca</sub>) and fast cardiac sodium channel (I<sub>Na</sub>) in a dose-dependent manner. Hence, they may exert the effect of class IV or class I antiarrhythmic drugs leading to a depression of cardiac depolarisation and impairment of impulse propagation. Taxine B causes atropine-resistant sinus bradycardia, atrio-ventricular blocks, and QRS complex prolongation — at higher doses it may lead to diastolic cardiac arrest. Blockade of either I<sub>Na</sub> or I<sub>Ca</sub> may induce the electrocardiographic phenotype of Brugada syndrome. There is no specific antidote to *Taxus* poisoning; therefore the treatment is symptomatic and supportive. In cases of severe shock, ventricular assist devices or extracorporeal life support may give patients a chance to survive the most serious toxemia.

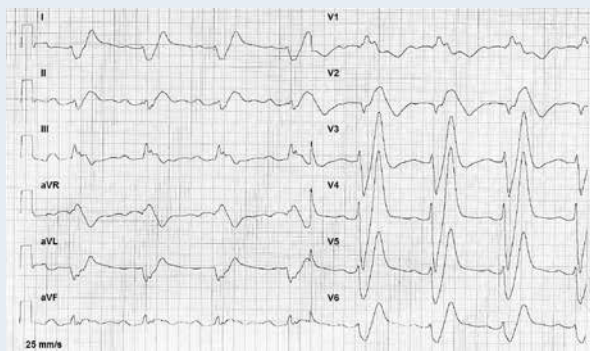


Figure 1. Electrocardiogram recording performed on admission (see text)

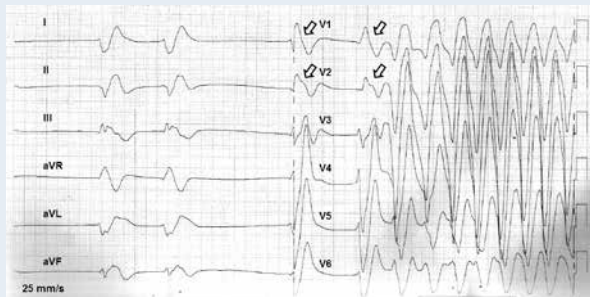


Figure 2. Electrocardiogram recording with Brugada-like pattern (arrows) followed by ventricular tachycardia

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**Conflict of interest:** none declared