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CASE REPORT

Stunned myocardium after an anesthetic procedure in a pediatric patient – case report☆

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Abstract Takotsubo syndrome (TTS) is an acquired transient type of systolic dysfunction which mimics myocardial infarction clinically and electrocardiographically. TTS is also known as stress cardiomyopathy, broken heart syndrome, apical ballooning, reversible acute heart failure, neurogenic stunned myocardium or acute catecholamine cardiomyopathy. This case report describes an uncommon presentation of myocardial stunning after an anesthetic procedure.

A 14-year-old girl with a history of pineal cyst and hemiplegic migraine was admitted for control brain magnetic resonance imaging. During anesthesia induction with propofol she suffered bradycardia, which was reversed with atropine, followed by tachyarrhythmia, reversed with lidocaine and precordial thump. Within hours she developed pulmonary edema and global respiratory failure due to acute left ventricular dysfunction. A transthoracic echocardiogram showed a dilated left ventricle with global hypokinesia and depressed left ventricular systolic function (ejection fraction <30%). The electrocardiogram showed persistent sinus tachycardia and nonspecific ST-T wave abnormalities. Cardiac biomarkers were elevated (troponin 2.42 ng/ml, proBNP 8248 pg/ml). She was placed on diuretics, angiotensin-converting enzyme inhibitors, digoxin and dopamine. The clinical course was satisfactory with clinical, biochemical and echocardiographic improvement within four days. Subsequent echocardiograms showed no ventricular dysfunction. The patient was discharged home on carvedilol, which was discontinued after normalization of cardiac function on cardiac magnetic resonance imaging.

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Few cases of TTS have been described in children, some of them triggered by acute central nervous system disorders and others not fulfilling all the classical diagnostic criteria. In this case the anesthetic procedure probably triggered the TTS.

PALAVRAS-CHAVE
Síndrome Takotsubo;
Miocárdio atordoado;
Idade pediátrica

Síndrome Takotsubo após procedimento anestésico em idade pediátrica – um caso clínico

Resumo A síndrome Takotsubo (STT) é uma forma adquirida e transitória de disfunção sistólica, cuja apresentação clínica e eletrocardiográfica mimetiza um enfarte agudo do miocárdio. A STT é também conhecida como miocardiopatia de *stress*, síndrome do «coração partido», balonamento apical, insuficiência cardíaca aguda reversível, miocárdio «atordoado» (forma neurogénica) ou miocardiopatia aguda das catecolaminas. Os autores descrevem uma apresentação rara de STT após procedimento anestésico.

Adolescente de 14 anos, sexo feminino, com antecedentes pessoais de enxaqueca hemiplégica e quisto pineal, submetida a ressonância magnética (RM) cranioencefálica de controlo. Durante a indução anestésica com propofol verificou-se bradicardia, revertida com atropina, seguida de taquidisritmia ventricular, revertida com lidocaína e murro pré-cordial. Nas primeiras horas de internamento evoluiu para edema pulmonar associado a insuficiência respiratória global por disfunção ventricular esquerda aguda. O ecocardiograma transtorácico mostrou dilatação do ventrículo esquerdo com hipocinesia global e fração de ejeção reduzida (<30%). O eletrocardiograma revelou taquicardia sinusal persistente e alterações inespecíficas do segmento ST. Os biomarcadores cardíacos encontravam-se elevados (troponina 2,42 ng/ml, proBNP 8248 pg/ml). Foi medicada com diuréticos, IECA, digitálico e dopamina, com melhoria clínica, bioquímica e ecocardiográfica ao quarto dia. Os ecocardiogramas subsequentes mostraram normalização da função ventricular. A doente teve alta medicada com carvedilol, que suspendeu após normalização da função cardíaca e RM cardíaca não ter revelado alterações.

Estão descritos poucos casos de STT em idade pediátrica. Alguns são desencadeados por patologia aguda do sistema nervoso central, mas nem todos cumprem os critérios de diagnóstico clássicos. Neste caso, o procedimento anestésico poderá ter desencadeado a STT.

Introduction

Takotsubo syndrome (TTS) is one of the unclassified cardiomyopathies, nonfamilial form.[1] It is an acquired transient type of systolic dysfunction which mimics myocardial infarction clinically and electrocardiographically.[2] TTS is also known as stress cardiomyopathy, broken heart syndrome, apical ballooning, reversible acute heart failure, neurogenic stunned myocardium or acute catecholamine cardiomyopathy.[3]

Various pathophysiological mechanisms have been proposed but the most widely accepted is an excess of catecholamines, leading to disruption of contraction and ventricular function,[1] which return to baseline values within days or weeks.[4] The clinical setting depends on the extent of myocardium affected and associated complications, which can include chest pain, dyspnea, palpitations, diaphoresis, nausea, vomiting or neurological symptoms.[1,3]

The authors describe a case of TTS in a pediatric patient after an anesthetic procedure, which presented as heart failure and acute pulmonary edema.

Case report

A 14-year-old girl with a history of hemiplegic migraine and pineal cyst was admitted for control brain magnetic resonance imaging (MRI). During anesthesia induction with propofol she suffered bradycardia, which was reversed with atropine, followed by ventricular tachyarrhythmia, reversed with lidocaine and precordial thump. Within hours she developed pulmonary edema (Figure 1) and global respiratory failure (PaO_2/FiO_2 156, pCO_2 57 mmHg) and hypotension (systolic/diastolic blood pressure 89/56 mmHg). The transthoracic echocardiogram showed a dilated left ventricle with global hypokinesia of the mid and basal segments but sparing the apex, resulting in moderate to severe impairment of left ventricular global systolic function and reduced ejection fraction (<30%) (Figures 2 and 3). The electrocardiogram (ECG) showed persistent sinus tachycardia and nonspecific ST-T wave abnormalities in V4 and V5 (Figure 4). Cardiac biomarkers were elevated (total creatine kinase [CK] 217 UI/l, troponin I 2.42 ng/ml and pro-brain natriuretic peptide [proBNP] 8284 pg/ml). The patient was placed on diuretics