Cardiology in the Young

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Sclerotherapy of oesophageal varices may induce chronic constrictive pericarditis in children

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Brief Report

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Abstract

Constrictive pericarditis is rare in children and can be difficult to diagnose. It has been described in adults after sclerotherapy of oesophageal varices but not in children. We report two cases of chronic constrictive pericarditis after sclerotherapy of oesophageal varices in children with portal cavernoma. Constrictive pericarditis should be considered as a cause of refractory ascites.

We report the case of two children operated on for constrictive pericarditis with a medical history of endoscopic sclerotherapy of oesophageal varices complicating a portal cavernoma.

Case report 1

A 14-year-old teenage boy presented with multiple episodes of oedema and ascites.

He was born at 29 weeks' gestation and had an umbilical venous catheter at birth. An inaugural haematemesis at 3 years old led to the diagnosis of oesophageal varices due to a portal cavernoma. At the age of 3, for 7 months, 5 endoscopic sclerotherapy sessions were performed with injections of 1% liquid polidocanol: 10 ml, 10 ml, 8.5 ml, 9 ml, and 4.5 ml. No complications occurred, and varices have been eradicated so far. In 2017, at the age of 12, during the annual monitoring of portal hypertension, mild cholestasis appeared: total bilirubin peaked at 45 µmol/l and there was a twofold increase in gamma-glutamyl-transpeptidase normal values. Hepatic parenchymal ultrasound scan and biliary MRI were normal. A systematic echocardiography in 2018 showed an isolated dilated poorly collapsible inferior vena cava.

At the age of 14, the first oedema-ascites decompensation occurred following bacterial pneumoniae. Diuretics were begun. A transparietal liver biopsy was performed and revealed unusual marked sinusoidal congestions and perisinusoidal fibrosis. Echocardiography and cardiac MRI showed a septal bounce and evidence for increased right atrial pressure. Cardiac catheterisation exhibited a dip-and-plateau pattern but no pulmonary hypertension. Cardiac CT scan showed 5-mm thickening of the pericardium.

The teenager underwent a complete pericardiectomy one year after his first decompensation. The appearance of the pericardium was thickened rigid encompassing the heart and limiting its expansion (Fig 1). Pathology showed non-specific chronic fibrous pachypericarditis. The patient had no known medical history of pericarditis, surgery, or radiotherapy, and the multiple infectious and autoimmune explorations were all negative (Table 1). The diuretic treatment was quickly stopped. One year after surgery, the teenager was asymptomatic, echocardiography was normal, gamma-glutamyl-transpeptidase activity normalised, and total bilirubin decreased to 26 µmol/L.

Case report 2

A 3-year-old girl presented with acute oedema and ascites.

She was born at 39 weeks' gestation with a birth weight of 4220 g. She presented with acute respiratory distress in the setting of refractory hypoxia and pneumothorax. She was intubated and ventilated for 3 weeks. She had an intrahepatic umbilical venous catheter for 10 days complicated with staphylococcal septicaemia. A splenomegaly was palpated during the first months

Table 1. Tests realised in case 1 to explore the aetiology of chronic constrictive pericarditis (tuberculosis is a common aetiology in endemic countries)

Cause	Viral	Bacterial (including tuberculosis)	Fungal	Inflammatory: Connective tissue disorder	Tumour
Investigations	Pericardial biopsy viral polymerase-chain reaction (PCR): cytomegalovirus (CMV), Epstein-Barr virus (EBV), parvovirus B19, human herpes virus 6 (HHV6). SARS CoV2 nasal PCR and SARS CoV2 serology.	Chest X-ray, thoracic computed tomography, interferon gamma release assay (IGRA), pericardial biopsy culture and pericardial fluid 40-day culture (searching for acid-alcohol resistant bacillus).	Aspergillus antigen, beta-glucan antigen, and pericardial fluid 21-day culture (searching for yeasts and mycelial filaments).	Antinuclear antibodies, rheumatoid factors, anti-cardiolipin and anti-beta2 glycoprotein1 antibodies, lupus-type anticoagulant testing, anti-neutrophil cytoplasmic antibodies, total complement (CH50), C3 and C4 fractions assays, serum protein electrophoresis and immunoglobulin assay, thyroid function and angiotensin II-converting enzyme activity assay.	Pericardial pathology.

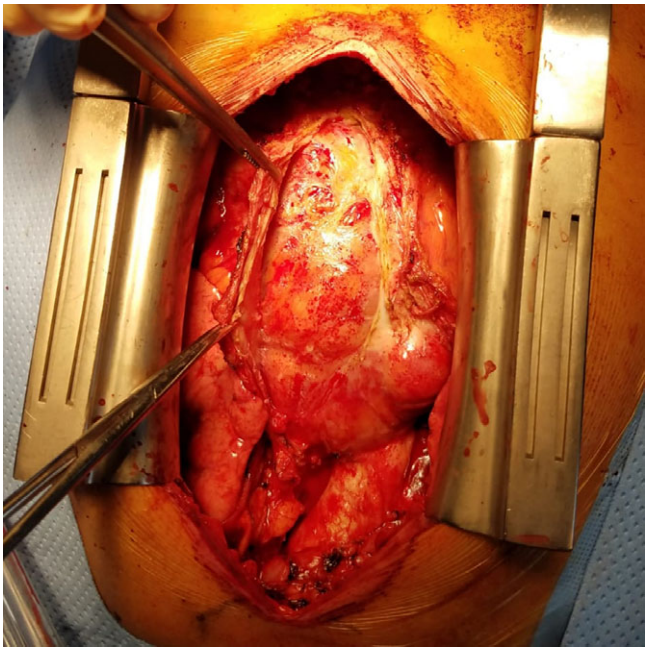

Figure 1. Intraoperative view of the child's thickened pericardium in case 1.

of life. At 14 months, epistaxis led to the diagnosis of hypersplenism with thrombocytopenia (60 G/L) and leukopaenia (3.5 G/L). Abdominal CT scan showed portal thrombosis. Thrombophilia workup, including antithrombin III, protein C and S, factor II and V mutations, homocysteinaemia, myeloproliferative leukaemia thrombopoietin receptor, and Janus kinase 2 mutations, was negative. Oesogastroduodenal fibroscopy showed grade 3 oesophageal varices with red signs. The girl had 5 primary prophylactic sclerotherapy sessions between 18 months and 3 years old with successive injections of 1% liquid polidocanol: 10 mL, 12 mL, 10 mL, 12 mL, and 15 mL.

Three months later, due to the onset of oedema and ascites at the age of 3, she had an echocardiography revealing a mild circumferential pericardial effusion. Biology revealed signs of hepatocellular insufficiency, including prolonged prothrombin time (ratio 25%) and decreased factor V activity (21%), normal transaminases but important cholestasis: total serum bilirubin was 260 µmol/l, direct bilirubin was 163 µmol/l, gamma-glutamyl transpeptidase activity increased twofold. Surgical liver biopsy showed hepatic vascular abnormalities with centrilobular haemorrhagic infiltration, centrilobular neo-veins with thickened intima, and cystic sinusoidal dilation.

Right heart catheterisation, performed 3 months after the beginning of ascites, showed moderate circumferential pericardial effusion and dip-and-plateau pattern. The child underwent emergency decortication of the biventricular and right atrial pericardium. Pathology showed fibrous pachypericarditis. Postoperative follow-up was simple, liver function and bilirubin normalised 3 weeks after surgery: prothrombin time ratio was 72% and factor V activity was 81%. Fourteen months after the pericardiectomy, the child underwent a mesenteric-caval diversion complicated with focal nodular hyperplasia. Intraoperative liver biopsy revealed hepatic recovery with a normal liver appearance.

Discussion

We report, for the first time in paediatrics to our knowledge, two cases of constrictive pericarditis secondary to endoscopic sclerotherapy in the setting of portal cavernoma. Articles have reported cases of chronic constrictive pericarditis after endoscopic sclerotherapy of oesophageal varices in adults but not in children.[1]

Neonatal umbilical venous catheterisation accounts for about a quarter of causes of portal cavernoma in children, a non-primary liver disease causing chronic portal vein thrombosis.[2] Varices are usual consequences of chronic extrahepatic portal vein obstruction leading to presinusoidal portal hypertension.[3] Although digestive bleeding is a frequent symptom, ascites is quite uncommon and usually resolves with the development of collateral circulation.[4] Portal cholangiopathy, due to compression of bile ducts by venous collaterals, should be suspected in children with portal vein obstruction who display abnormal liver tests.[5] However, other aetiologies including right ventricular heart failure should be looked for in this context. Chronic ascites and cholestasis should lead to the investigation of constrictive pericarditis.

Acute pericarditis has been reported in two adult cases in the days following sclerotherapy, probably because of the vicinity of the oesophagus and the pericardium. High-dose polidocanol injections could promote an inflammatory reaction around the oesophagus despite the absence of oesophageal perforation. Acute and chronic pericarditis are, however, not yet mentioned in the adverse reactions of this product.[6] Moreover, symptoms of acute pericarditis during the days following sclerotherapy can

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be absent, mild or overlooked especially in young children when the identification of symptoms can be challenging.[7] The disease can be long asymptomatic and chronic constrictive pericarditis should be suspected even several years after the sclerotherapy. This can lead to diagnostic delay although a long time to diagnosis is not associated with poor outcomes in new-onset heart failure.[8]

Chronic constrictive pericarditis may be a delayed serious complication of endoscopic sclerotherapy in children. The occurrence of oedema, ascites, abnormal liver tests, or vascular liver histology abnormalities is unusual in children with portal cavernoma, chronic constrictive pericarditis should then be suspected with a history of endoscopic sclerotherapy. We recommend setting up a specific screening programme by repeated echocardiography after sclerotherapy of oesophageal varices.

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Conflicts of interest. None.

Ethical standards. The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national guidelines on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008, and has been approved by the institutional committees.

Informed written consent was obtained from all individual participants included in the study and their parent or legal guardian. The participants and their parent or legal guardian have consented to the submission of the case reports to the journal.

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