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Cardiac tamponade as a complication of parenteral nutrition



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ABSTRACT

INTRODUCTION: Complications arising from the use of central venous catheters are numerous, but cardiac tamponade is a complication well defined, very rare and often fatal. The mortality rate is 47–77% in the literature.

PRESENTATION OF CASE: We report a case of successful diagnosis and treatment of cardiac tamponade by parenteral nutrition in a 31-year-old female.

DISCUSSION: There are only few cases of cardiac tamponade reported in the world literature since 1958. The true incidence is unclear and the most cases occur in children. Despite the rarity of this condition, it has a high mortality rate. The clinical findings are pain and discomfort in the epigastrium and chest region, nausea, dyspnea, tachycardia, distended jugular veins, paradoxical pulse, hypotension, electrocardiographic tracing signals with low voltage and enlargement of cardiac area. The immediate diagnosis and the treatment of cardiac tamponade are capital for patient survival.

CONCLUSION: Cardiac tamponade should be suspected among patients with sudden onset of shock in use of parenteral nutrition, and therefore immediately treated.

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1. Introduction

Complications from the use of central venous catheters are numerous, but cardiac tamponade is a complication well defined, very rare and often fatal [1]. Mortality ranges 47–77% in the literature [6]. Cardiac perforation can occur during the catheterization procedure or may develop from wall erosion in a long term catheterization [2,7]. The most common sites of perforation are the atrium and the right ventricle (80%), followed by the superior vena cava [1].

2. Case report

A 31 year-old female was submitted to a enucleation of neuroendocrine pancreatic non functioning tumor. In the postoperative period evolved with necrotizing pancreatitis and total parenteral nutrition (TPN) for central venous access was established Fig. 1.

In the Intensive Care Unit (ICU), right subclavian vein was punctured with catheter Certofix Duo central venous access (two-way,

720 V, 16 Fr, 20 cm, B. Braun Melsung, Melsung, Germany) using the Seldinger technique.

On the 10th day of TPN the patient developed a sudden clinical event: acute shock with partial response to volume replacement in peripheral venous access. The patient was sent back to the ICU and had no improvement with intensive support. She was submitted to a computed tomography which showed right hydronephrosis with ureterolithiasis (two calculations in the distal ureter) and pericardial effusion Fig. 2.

The patient showed progressive worsening with tachypnea (50 bpm), tachycardia (150 bpm), central venous pressure of 25 cm H₂O and intra-arterial pressure of 70 × 40 mm Hg. Pericardiocentesis was done with the removal of 180 mL of milky pink aspect liquid with immediate improvement in the hemodynamic parameters Fig. 1. Then, the central venous catheter was retrieved. The laboratory analysis, measurement of glucose and triglyceride levels in pericardial effusion (glucose 220 mg/dL and triglyceride 703 mg/dL) was compatible with parenteral nutrition and the realization of echocardiography after pericardiocentesis evidenced two thrombi in the right atrium, one sessile and one pediculate Fig. 2. Therefore, heparinization was started.

The patient showed favorable hemodynamic evolution and remained in the hospital for a few weeks and was discharged in good condition. Currently she is asymptomatic in ambulatory care.

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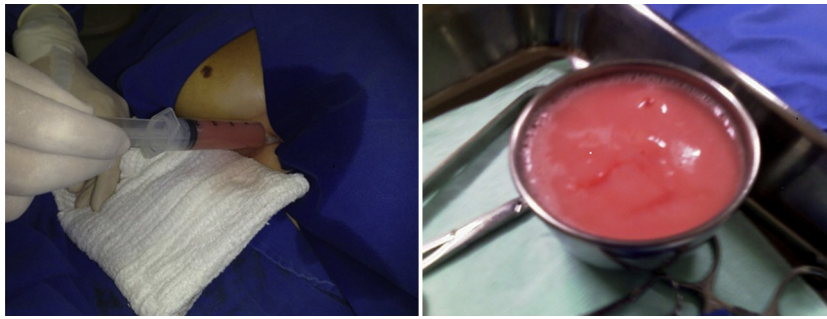


Fig. 1. Pericardiocentesis with the removal of milky pink aspect liquid.

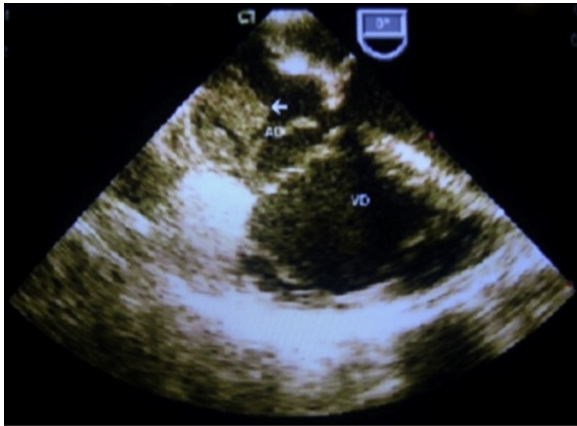


Fig. 2. Images of *trans-oesophageal* echocardiography after pericardiocentesis showing two evident thrombus in the right atrium, one sessile and other pediculate (provided by the Echocardiography service, Hospital Felício Rocho, MG).

3. Discussion

There are only few cases of cardiac tamponade reported in the world literature since 1958. The true incidence is unclear, because studies show a wide variation of incidence from 0.0001 to 1.4% of all punctions [1]. Most cases occur in children. Despite the rarity of this condition, it has a high mortality rate [7].

The myocardial injury is probably caused by movement of the catheter (for example, arm movement), by movements of the heart and superior cava vena (cardiac cycle) and by direct trauma. Besides, the administration of hyperosmolar solutions (such as TPN) increases the risk of erosion and perforation of the cardiac wall [1].

To prevent such complication, it would be useful to assure the catheter tip is above the pericardial reflection. Various methods have been proposed, such as plan X-rays and ECG guided catheter insertion [8].

Signs and symptoms of cardiac tamponade can occur in a few minutes up to 5 months after catheter insertion. In 36% of patients, they occur in the first 24 h after the procedure. However, in 82% at patients, symptoms may be presented during the first week.

The clinical findings are pain and discomfort in the epigastrium and chest region, nausea, dyspnea, tachycardia, distended jugular veins, paradoxical pulse, hypotension, electrocardiographic tracing signals with low voltage and enlargement of cardiac area [3–5]. However, in 29% of cases death may occur suddenly after nonspecific signals [1].

The immediate diagnosis and the treatment of cardiac tamponade are important for patient survival. Whenever this complication is suspected, it should be confirmed with radiological examinations, electrocardiogram and arterial blood gas [2]. The

echocardiography, being trans-thoracic or trans-oesophageal, is the test of choice.

As the diagnosis is established, infusion must be immediately discontinued and the pericardiocentesis must be realized to relieve pressure in the pericardium. If this procedure is insufficient, the urgency thoracotomy must be promptly performed [1–2].

4. Conclusion

Cardiac tamponade by parenteral nutrition should be considered among the differential diagnoses in patients with sudden onset of shock and are on long-term central venous access for this purpose. Treatment should be immediate with pericardiocentesis, removal of central venous access and full heparinization.

Conflicts of interest

None.

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None.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author's contribution

Diego Paim Carvalho Garcia and Clarissa Santos Neto – writing and picture art.

Pablo Nelson Valle Hubner and Thiago de Almeida Furtado – data collections.

Andy Petroianu and Luiz Ronaldo Alberti – study design and data analysis.

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