Case report - Thoracic oncologic

Acute postoperative cardiac herniation

Kenji Kawamukai, Filippo Antonacci, Salomone Di Saverio, Maurizio Boarona

1. Introduction

Extrapleural pneumonectomy, whenever indicated, is a surgical option for the treatment of malignant pleural mesothelioma. It represents a highly demolitive procedure with considerable mortality and morbidity rate. Pericardium is usually resected and reconstructed with a synthetic prosthesis. Cardiac herniation due to a dehiscence of the pericardial prosthesis suture is a rare but often lethal occurrence.

We present a case of a completely asymptomatic patient with a right cardiac herniation incidentally diagnosed after postoperative chest X-ray.

2. Case report

A 55-year-old male underwent a right extrapleural pneumonectomy after neoadjuvant chemotherapy for a malignant pleural mesothelioma. The right pericardium was resected and reconstructed with a polytetrafluoroethylene (PTFE) tailored prosthesis fixed with non-absorbable polypropylene interrupted sutures.

The patient was transferred to the postoperative intensive care unit and remained asymptomatic all the time without any hemodynamic impairment. One hour after the end of surgery, a routine chest X-ray revealed unexpected massive dextrocardia (Fig. 1). The patient was immediately brought back to theatre for emergency thoracotomy. A cardiac herniation was found to be caused by a partial dehiscence of the pericardial prosthesis suture. The defect was repaired without consequences.

3. Comment

The role of surgical resection in the management of malignant pleural mesothelioma is still controversial [1]. In order to prolong survival, the aim of surgery in treating mesothelioma is macroscopic tumor eradication [2]. The two main surgical options are pleurectomy/decortication or extrapleural pneumonectomy.

Extrapleural pneumonectomy is currently a treatment option for selected patients and consist of an en-bloc resection of the disease involving the pleurae, lung, ipsilateral hemidiaphragm, and pericardium [3]. However, despite recent advances in surgical techniques and perioperative management, the procedure remains technically more complex than pleurectomy and decortication, with a significantly higher risk of perioperative complications and death [4], especially when performed on the right side.

The pericardium is usually reconstructed with a PTFE prosthesis. Dehiscence of the pericardial prosthesis suture and the consequent cardiac herniation is a rare circumstance and its extremely high mortality is due to the risk of hemodynamic failure.

Herniation of the heart is described in patients with iatrogenic, traumatic, and congenital pericardial defects [5]. The first report of this occurrence appeared in the medical literature in 1948 by Bettman and Tannenbaum [6]. It represents a rare surgical complication, most commonly seen after pneumonectomy with associated pericardiectomy or pericardiectomy [5]. In particular, the incidence after...
extrapleural pneumonectomy following chemotherapy is approximately 3% [7].

Cardiac herniation is a life-threatening condition with a high mortality rate (50–100%) [8] especially in right-sided herniation where the torsion of the atrio-caval junctions and great vessels results in reduction of blood return, leading to a dramatic fall in cardiac output.

Clinical presentation may vary widely, from sudden death to totally asymptomatic cases [9]. The only effective resuscitative treatment is emergency re-thoracotomy [8]. Conservative measures to facilitate recovery from the shock status before and during transfer to the operation suite include returning to the lateral decubitus with non-surgical side down avoiding hyperinflation of the remaining lung and injecting 1-2 l of air into the surgical hemithorax [10].

In the case we describe, we incidentally diagnosed such a condition with a routinely performed postoperative chest X-ray, since the patient was completely asymptomatic. He was immediately re-operated and the defect repaired without any hemodynamic consequence before, during and after re-thoracotomy. In our opinion, the successful management of this rare complication is the result of a mixture of several different factors: early diagnosis, immediate surgery and, last but not least, a blessed stroke of luck.

Although cardiac herniation after an extrapleural pneumonectomy is uncommon, thoracic surgeons should always consider this occurrence as a potential complication when approaching this kind of surgery, regardless of the presence of clinical symptoms.

References


Fig. 1. Postoperative chest X-ray.