Case Report

ANTITHROMBOTIC PROPHYLAXIS IN LAPAROSCOPIC CHOLECYSTECTOMY

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SUMMARY

Pulmonary thromboembolism is a common cause of in-hospital death. In moderate or high risk patients undergoing laparotomy, acute and long-term mortality can be effectively reduced with an appropriate prophylactic drug treatment, while in low-risk patients undergoing laparoscopy, the correlation between the thromboembolism risk and the procedure itself, as well as potential benefits of thromboprophylaxis are, at present, unclear. Here we report the case of E., a 49-year-old woman with patent foramen ovale, considered to be at low risk of thromboembolism, who experienced a sudden cardiopulmonary arrest following a laparoscopic cholecystectomy and died four days later. . The purpose of this case report is to highlight the necessity of continuing large sample studies on the correlation between laparoscopic surgery and thromboembolism in low-risk patients.

Introduction

Pulmonary thromboembolism is a common cause of in-hospital death; without thromboprophylaxis, the incidence of hospital-acquired venous thrombosis is around 10-40% in surgically treated patients [1]. According to other estimates, the incidence of fatal pulmonary embolism is generally 0.1-0.8% in patients undergoing elective general surgery [2]. Acute and long term mortality rates can be effectively reduced through diverse treatment strategies depending on the risk levels of the individual patients (high or moderate): a large number of randomized clinical trials have shown an irrefutable reduction in venous thrombosis and pulmonary thromboembolism cases with the application of a thromboprophylactic drug treatment protocol. Despite the complications associated with antithrombotic therapies, such trials have also shown small or non-increased rates of bleeding associated with prophylactic use of low-dose unfractionated heparin (LDUH) or low molecular weight heparin (LMWH) [3].

Although laparoscopy is now considered the preferred surgical technique, the correlation between the risk of thromboembolism and such procedure is currently unclear, and thus the use of thromboprophylaxis remains controversial [1, 2, 4] .

The percentage of cases with venous thromboembolism following laparoscopic surgery appears to be low, as confirmed by some studies. Other authors, however, argue that laparoscopic surgery (such as laparotomy) increases the risk of developing thrombosis due to the increased abdominal pressure and the use of Trendelenderbug position [2].

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Case Report

E., a 49-year-old woman, healthy apart from a prior diagnosis of type 2 diabetes, and, therefore, considered of a low operative risk, was subjected to laparoscopic cholecystectomy following an episode of acute cholecystitis. Prior to surgery, low molecular weight heparin was administered in doses appropriate for her body weight; however, twenty-four hours later, respiratory failure with subsequent cardiac arrest manifested, followed by the recovery of the cardiac activity after resuscitation. The patient lapsed into a coma and was transferred to another hospital, where, following further medical investigation, including a brain and chest CT scan, electroencephalogram, and full abdominal ultrasound scan, fulminant hepatitis was suspected. After four days, the patient died despite the cardio-respiratory maneuvers and emergency ventilatory support [5].

Autopsy findings revealed the absence of traumatic injury; a saddle pulmonary embolism was detected together with a thrombus in the inferior vena cava; the lungs were deemed normal in terms of appearance and volume; edematous cut surface was observed. Numerous blood clots and/or emboli characterized by platelet (white) and glossy red components were observed in the heart, which was found otherwise normal in form and volume. The valve system appeared normal and a patent foramen ovale was observed. The liver, steatotic and with a slightly increased volume, showed coagulative necrosis associated with hemorrhagic centrilobular steatosis and lymphocytic cholangitis. The main bile ducts were patent. The spleen displayed acute stasis and severe congestion was observed in the renal parenchyma. The small intestine appears normal in its course, except in the iliac region where an ischemic area was observed. At the opening of the bowel, the presence of black fecal material occupying about three-quarters of the intestine was noted.

Histological examination, using a hematoxylin-based stain, confirmed a massive pulmonary embolism (Figure 1), biventricular endomyocardial fibrosis with focal necrotic evolution associated with granulocyte infiltration, hepatic coagulation necrosis associated with steatosis, colliquative autolysis of the pancreas; acute ileal hemorrhage involving the mucosa, with cytotoxic edema, subcortical neuronal necrosis (involving the hippocampus and basal ganglia) and the presence of a leptomeningeal septic embolus (Figure 2).

Discussion

At present, an increasing number of diseases, especially of the liver, pancreas and bile ducts, are treated with laparoscopic surgery because this type of approach significantly reduces surgical stress. At the moment, there are no studies that clearly
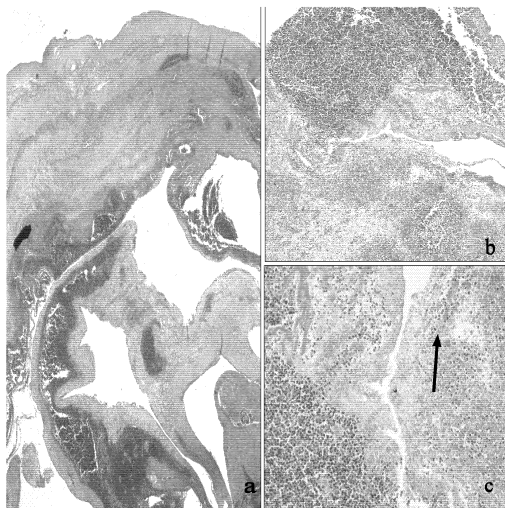

Figure 1: Pulmonary artery - thrombotic material represented by platelets, erythrocytes and numerous neutrophils; in this context, colonies of bacteria are observed (arrow). A: x10. B and c: x20.
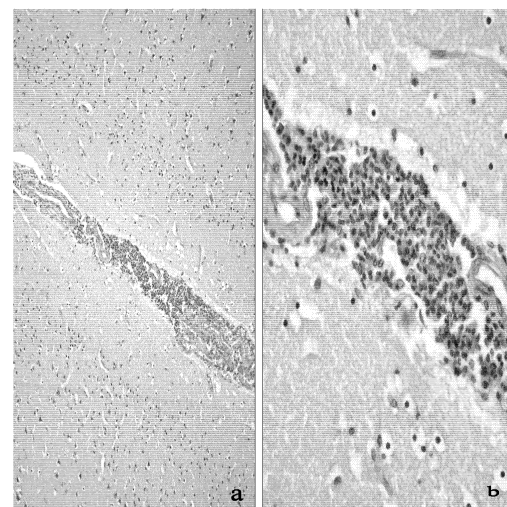

Figure 2: Brain – septic emboli represented by vast leptomeningeal granulocytic infiltration. A: x10. B: x40.

demonstrate an association between laparoscopic surgery and increased incidence of thromboembolism, with the consequent potential of thromboprophylaxis to reduce the risk of death or incidence of pulmonary embolism.

In a review including 153.832 laparoscopic cholecystectomies in which thromboprophylaxis protocols were employed, the average percentages of deep vein thrombosis, pulmonary embolism and fatal pulmonary embolism cases were 0.03%, 0.06% and 0.02%, respectively [6]. In a sample of 105.850 laparoscopic cholecystectomies performed in California, the risk of symptomatic thromboembolism within three months from the procedure was 0.2%, compared with 0.5% following traditional cholecystectomy surgery [7]. In addition, among 422 patients not subjected to any type of thromboprophylaxis, only one developed symptoms associated with deep vein thrombosis.

Several associations, such as the European Association for Endoscopic Surgery and the American College of Chest Physicians have expressed diverse opinions about the implementation of antithrombotic prophylaxis protocols in low-risk patients undergoing laparoscopy.

Recently, some authors published research results showing that laparoscopic cholecystectomy can be considered a procedure at a low risk of thrombosis, and therefore the use of routine thromboprophylaxis is probably not justified in all patients; however, further studies should be carried to obtain irrefutable clinical confirmation for this hypothesis [4].

Most of the currently available studies recommend antithrombotic therapy only in the presence of major risk factors.

There are several ways to stratify the risk of thromboembolism: one approach considers the patient's predisposing factors and the degree of risk associated with the procedure, while a second, more simplified approach assigns a score from one to four based on the type of operation (major or minor), patient age (less than 40, 40-60, over 60), and the presence of additional risk factors (such as the presence of cancer or previous cases of venous thromboembolism) [8].

In the present case, the patient, E., had a low embolic risk, no prior history of thrombotic events or comorbid conditions, was 49 years old, and the planned intervention was considered a minor surgery. Nevertheless, the doctors decided to administer a thromboprophylaxis to the patient. Therefore, in our patient's case, a low thrombosis risk combined with an appropriate prophylaxis did not eliminate the possibility of a pulmonary embolism.

Alterations of the coagulation system are among the most frequent consequences of general surgery, and laparoscopic surgery is no exception.

Further studies on larger samples are needed to gain a better understanding of the correlation between the incidence of thromboembolism and laparoscopic cholecystectomy, as well as the influence of "silent" birth defects (such as patent foramen ovale) and to define new guidelines for standardizing therapeutic procedures.

The present clinical case also offers another interesting piece of evidence: the presence of a septic brain embolus. This was probably caused by the patient's patent foramen ovale [9]. Some authors show a higher incidence of neurological complications following laparoscopic surgery in patients with patent foramen ovale; this would seem to lead to the conclusion that these patients should be referred to a laparatomy procedure instead. However, in absence of in-depth studies, there are currently no clear indications specific to such situations.

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