

Postoperative embolic complications after cytoreductive surgery for advanced stage ovarian cancer

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ABSTRACT

Postoperative embolism after pelvic surgery for ovarian malignancies represents a serious adverse event which might be fatal and should be carefully prevented. In such cases multiple risk factors have been incriminated such as the presence of the malignancy, particularly in cases in which an ovarian primary is suspected, the necessity of performing extended pelvic resections, the length of the surgical procedure, the position of the patient on the operating table or the difficult and late postoperative mobilization of the patient. The aim of the current paper is to report the cases of six patients who developed severe postoperative embolic complications after surgery for advanced stage ovarian cancer and to analyze the risk factors which seem to increase the risk of developing such adverse effects.

Keywords: embolism, ovarian cancer, pelvic surgery

INTRODUCTION

Ovarian cancer represents one of the most lethal malignancies which remains asymptomatic for a long period of time and, which necessitates very complex surgical procedures in order to maximize the debulking effort and therefore to increase the chances for long term survival [1,2]. However, such extended procedures are associated in certain cases with long operative times, a high amounts of blood loss necessitating administration of blood products, a particular position of the patient on the operating table, steep Trendelenburg position and a later and more difficult postoperative mobilization of the patient [3-5]. Therefore, in such cases, a higher risk of

embolic complications has been reported. Meanwhile the presence of neoplastic diseases per se, such as ovarian cancer represents a risk factor for developing embolic complications [7-10].

MATERIAL AND METHODS

After obtaining the approval of the ethics committee no 11/2022 in "Cantacuzino" Clinical Hospital, data of patients submitted to surgery for advanced stage epithelial ovarian cancer between 1 July and 31 December 2021 were retrospectively reviewed. Among these cases we identified six patients who developed postoperative severe embolic complications and who necessitated a prolonged hospital in stay.

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RESULTS

The mean age of the patients who experienced severe postoperative complications was of 73 years (range 67-78 years) while the mean CA125 serum levels was of 2187 UI/ml (range 1850-2700 UI/ml). When it comes to the FIGO stage at the time of the initial diagnostic, there were four cases diagnosed with stage IIIC ovarian cancer and two cases diagnosed with stage IV ovarian cancer; in all cases cytoreductive surgery to no residual disease was attempted; however, this desiderate was achieved in four out of the six cases, in the other two cases an R1 resection being achieved. The mean operative time was of 210 minutes (range 180-320 minutes), the mean estimated blood loss was of 600 ml (range 400-1300 ml) while the mean units of transfused blood derivatives were of 2 units (range 1-3 units). Postoperatively one of the six cases necessitated reoperation for postoperative hemoperitoneum while other three cases necessitated prolonged intensive care unit stay ranging between three and six days. The whole length of the postoperative hospital in stay ranged between eight and 19 days. As for the type of venous embolic complications, they were represented by deep venous thrombosis in four complications and respectively pulmonary embolism in two cases. In all cases curative doses of low molecule heparin were administrated.

Meanwhile, four of the six cases reported a previous experience of deep venous thrombosis while five of the six cases had a previous history of smoking.

DISCUSSIONS

It is widely accepted that venous embolic complications represent serious postoperative complications especially in cases with gynecological malignancies alone or in association with other known thrombotic events [9,10]. Meanwhile, in advanced stages of the disease or in cases diagnosed with distant metastases, the risks of developing venous thrombotic events might reach 30% and it seems to be similar for digestive and gynecological malignancies such as pancreatic, gastric or ovarian cancer [11]. Meanwhile this risk seems to be significantly augmented by other factors such as previous history of embolic events, history of smoking, chronic venous insufficiency, radiotherapy, chemotherapy, lower limb lymphedema, prolonged surgical procedures or difficult postoperative mobilization of the patient [12,13]. Other factors which might be associated with a higher risk of postoperative embolic complications are related to a shorter length of the perioperative administration of low molecule heparin injections and placement of central venous catheter [14,15,16]. The presence of the malignant process is per se a risk

factor for developing postoperative embolic complications; therefore, malignant cells in the peritoneal cavity are capable to release different cytokines and chemokines which can further increase systemic coagulability. This mechanism can be combated if heparin is administrated, an increasing action of antithrombin is expected and therefore, a delay of cloth formation is to be expected [17,18].

As it can be seen from the above presented information, factors increasing the risks of perioperative embolism can be classified into two categories: factors which can be influenced or prevented and factors which cannot be modified; therefore, while age, smoking status or previous history of embolic events cannot be changed, other factors such as the early mobilization of the patient, the perioperative therapy with low molecular heparin, the length of the surgical procedure, the intraoperative blood loss or the position on the operating table can be at least partially modified and corrected in order to diminish the risks of perioperative thrombotic events [13-15].

Therefore, in the study we conducted, attention was focused rather on identifying and analyzing the factors which can be influenced in order to decrease the risks of embolic events.

Another interesting factor which was analyzed by certain authors regards the malignancy itself; therefore, in a study conducted by Morimoto et al and published in *Anticancer Research* in 2014 the authors analyzed the risks of developing postoperative embolic events after gynecologic malignancies in general; the study included 751 patients submitted to surgery for gynecologic malignancies and demonstrated that the risks of developing embolic events is significantly higher among cases diagnosed with ovarian cancer when compared to all the other types of malignancies; meanwhile the authors underlined the fact that other independent risk factors were represented by age and length of the surgical procedure. In the meantime the authors underlined the fact that administration of unfractionated heparin or low molecular weight heparin in association with compression stockings might play a central role in order to prevent postoperative embolic events and might be also associated with a significant cost reduction for the postoperative period [19].

CONCLUSIONS

Extended surgical procedures for pelvic malignancies are associated with increased risks of postoperative embolic complications such as pulmonary embolism or deep venous thrombosis especially in cases diagnosed with ovarian cancer. Meanwhile, other risk factors such as previous history of throm-

botic events, history of smoking, age or previous history of chemotherapy and/or radiation therapy are also associated with increased risks of developing embolic events. Meanwhile, lower length of the sur-

gical procedure, more rapid postoperative mobilization and perioperative administration of low molecular weight heparin might be considered as protective factors against developing such complications.

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