

# The impact of preoperative platelet count in vulvar cancer patients

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## ABSTRACT

The preoperative platelet count proved to be a significant prognostic factor for short term and long-term prognostic in gynecological cancers such as endometrial or ovarian cancer. However, more recently it has been supposed that this parameter could also influence the outcomes of vulvar cancer patients.

The aim of the current paper is to study the influence of the preoperative platelet count on the perioperative outcomes in vulvar cancer patients submitted to surgery between June 2021 and May 2022 in "Cantacuzino" Clinical Hospital.

**Keywords:** platelet count, vulvar cancer, perioperative outcome

## INTRODUCTION

Once human papilloma virus infection reported an increasing incidence worldwide, not only cervical cancer had an increasing incidence; therefore, other human papilloma virus related neoplastic diseases were more frequently encountered. One of the most commonly encountered such malignancies is represented by vulvar cancer [1-3]. Depending on the location, stage and extent of the lesions, different therapeutic strategies have been proposed. In certain cases, although surgery with curative intent is performed the overall prognostic remains poor; therefore attention was focused on identifying different prognostic factors which might offer a better personalization of the treatment for each case [3-5]. Platelet count has been extensively studied in the last decade and proved to have a prognostic

significance in numerous malignancies [6]. The aim of the current paper is to investigate the correlation ship between the platelet count and the perioperative outcomes in vulvar cancer patients submitted to surgery between June 2021 and May 2022 in "Cantacuzino" Clinical Hospital.

## MATERIAL AND METHODS

After receiving the approval of the Ethics Committee of "Cantacuzino" Clinical Hospital, data of patients submitted to surgery for vulvar cancer between June 2021 and May 2022 were retrospectively reviewed. Preoperative thrombocytosis was defined as a platelet count higher than 450000/microliter. Therefore, the patients were further classified in two groups according to this value; the first group

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included patients with a number of platelets lower than this value while the second group included patients with a higher number of platelets.

## RESULTS

Finally, 53 patients with vulvar cancer were identified, all of them being submitted to surgery as first intent procedure; the median age at the time of diagnostic was of 71 years (range 56-85 years) while the median BMI was of 28 kg/m<sup>2</sup>, range 21-45 kg/m<sup>2</sup>; meanwhile, there was no significant differences between the median age and the median BMI between the two groups. When it comes to the associated comorbidities, the incidence of arterial hypertension, diabetes mellitus and pulmonary chronic obstructive syndrome were similar between the two groups, the single associated disorder which was more frequently encountered in the second group being represented by the antecedents of deep venous thrombosis (which was significantly more frequent in the second group). Preoperative and intraoperative details are shown in the table below.

As it can be observed from table 1, the differences in terms of age, body mass index, preoperative comorbidities – excluding the presence of deep venous thrombosis – and the histopathological subtype were not statistically significant. However, patients with a higher number of circulating platelets trended to be older and to be diagnosed more frequently with squamous cell carcinoma; meanwhile, these patients were diagnosed in more advanced stages of the disease (p=0,004) and with more biologically aggressive tumors (p=0,04); meanwhile, the presence of HPV infection was more frequently in the first group (p=0,004), among patients who were also younger when compared to the second group. When it comes to the paraclinical tests, patients in the second group had a significantly lower value of the hemoglobin level, probably due to the presence of a more advanced disease (p=0,002).

When it comes to the intraoperative outcomes, although all patients were submitted to surgery with curative intent, negative resection margins were obtained in 23 patients in the first group and respectively 21 cases in the second group (p=0,002). As for the presence of lymph node metastases, they were significantly more common among the second group (18 cases versus 8 cases, p=0,0001).

All these data come to suggest that a positive correlation ship can be established between a higher number of platelets and a poorer perioperative outcome (more aggressive tumoral biology, more advanced stage at diagnostic, more incomplete resections and a higher number of positive retrieved lymph nodes).

**TABLE 1.** Preoperative and intraoperative features of patients submitted to surgery for vulvar cancer

Parameter	Group A	Group B	p value
No of cases	25	28	-
Median age (range, years)	68 (56-79)	73 (59-85)	p=0,08
Median BMI (range kg/m <sup>2</sup> )	29 (23-42)	28 (21-45)	p=0,76
Preoperative comorbidities:			
- Arterial hypertension	12	14	p=0,43
- Diabetes Mellitus	11	10	p=0,78
- Chronic pulmonary obstructive disease	3	5	p=0,28
- Deep venous thrombosis	1	3	p=0,04
FIGO stage at diagnostic:			
- I	11	7	p=0,003
- II	5	4	
- III	6	11	
- IV	3	6	
Histopathological subtype:			
- Squamous cell	18	21	p=0,09
- Non-squamous cell	7	7	
Degree of differentiation:			
- G1	12	8	p=0,04
- G2	11	12	
- G3	2	8	
Association of HPV infection:			
- Yes	21	11	p=0,004
- No	4	17	
Median number of platelets (range)	323.000 (210.000-423.000)	498.000 (450.000-625.000)	p=0,0001
Median value of hemoglobin (range, g/dl)	10,9 (9,5-13,3)	8,8 (6,5-12,9)	p=0,002

## DISCUSSIONS

The correlation ship between the number of circulating platelets and the presence of solid tumors has been widely studied so far; therefore, it seems that tumoral cells will mediate the production of cytokines such as Interleukin 1, 3, 6 and 9 which will further stimulate thrombopoiesis and of thrombin which will further stimulate angiogenesis; therefore, the apparition of large amounts of these substances in the systemic circulation will further stimulate tumoral migration and proliferation. In this

respect, certain authors came to conclude that administration of substances which inhibit the action of circulating cytokines and thrombin will further conduct to the improvement of the long-term prognostic of patients with solid tumors such as vulvar neoplastic disease [6,7].

When it comes to vulvar cancer, initial studies conducted on this issue, in 1999-2000 failed to demonstrate the presence of a significant correlation between the platelet count and the presence of lymph node metastases, FIGO stage, disease free or overall survival in vulvar cancer patients [8,9].

However, more recent studies came to demonstrate that the presence of increased numbers of circulating platelets is also correlated with a poorer outcome in vulvar cancer patients and underlined the fact that in such cases a more specific, personalized treatment should be taken in consideration [6].

In order to obtain an even better correlation between the results of the preoperative hemogram and the overall prognostic, other authors went even

further and investigated the relationship between the preoperative level of platelet to lymphocyte ratio and the overall prognostic of vulvar cancer; therefore in a study conducted on this issue by Ertas et al. and published in 2013 the authors came to underline the fact that the presence of a higher value of platelet to lymphocyte ratio is more frequently associated with the presence of lymph node metastases and with the presence of larger tumors; meanwhile this parameter seemed to have a significant influence over the tumor related death [10].

## CONCLUSIONS

Patients diagnosed with vulvar cancer in the presence of a higher number of preoperative platelets trend to present in fact more aggressive tumors, are at risk to have more frequently positive lymph nodes and positive resection margins; therefore these cases might have a better benefit if association of neoadjuvant therapy is taken in consideration.

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