



# Searching for the Best Way to Assess the Risk of Thrombosis in Aesthetic Plastic Surgery; The Role of the Caprini/Pannucci Score



Jesús Cuenca-Pardo<sup>1</sup> · Guillermo Ramos-Gallardo<sup>1</sup> · Lázaro Cárdenas-Camarena<sup>1</sup> · Livia Contreras-Bulnes<sup>1</sup> · Gerardo Lelevier De Alvear<sup>1</sup>

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## Abstract

**Introduction** There is concern regarding the high incidence of thrombosis in plastic surgery patients. For this reason, we wanted to compare the results of the Caprini/Pannucci score in patients with and without a past history of thrombosis admitted for aesthetic plastic surgery.

**Methods** This was a case–control study of 152 patients undergoing aesthetic plastic surgery procedures. We formed two groups: Group I had 70 patients who had thrombosis after aesthetic plastic surgery and group II had 82 patients without thrombosis. We studied the considered risk factors for thrombosis. We weighted the factors according to the OR and linear regressions. We then related them to the Caprini/Pannucci score.

**Results** Patients in group I had a score of 5.68 versus 3.45 in group II ( $p < 0.001$ ). There was a 9.86% increase in thrombosis for each increased point in the rating. A higher effectiveness of the Caprini score was found in the high-score group; the greatest flaw was in the low-scoring group. The sensitivity was 75.71%, and the specificity was 70.73%. The factors with the greatest impact were the infiltration of fat in the buttocks, degree of obesity and time of surgery. There was an increased risk of thrombosis in patients with gluteal fat injections, varicose veins, obesity and immune disorders as well as those who had previously given birth.

**Conclusion** To increase the effectiveness of the score and to use the score as a basis on which to decide upon

prophylactic care, it is necessary to modify the score and add some factors.

**Level of Evidence III** This journal requires that authors assign a level of evidence to each article. For a full description of these Evidence-Based Medicine ratings, please refer to the Table of Contents or the online Instructions to Authors [www.springer.com/00266](http://www.springer.com/00266).

**Keywords** Thrombosis · Thromboembolism risk factors · Caprini/Pannucci score · Aesthetic plastic surgery patients · Aesthetic surgery procedures · Caprini risk assessment

## Introduction

Venous thrombotic disease is one of the main complications in surgical patients. Unfortunately, many times, the disease is asymptomatic [1, 2]. The diagnosis is difficult, and the real incidence cannot be established accurately. The findings in various autopsies show deep vein thrombosis (DVT) and pulmonary thromboembolism (PE) in individuals who had not been suspected of the disease. Pulmonary embolism is the main cause of death in patients who undergo aesthetic plastic surgery [3].

Abdominoplasty is a procedure with an increased risk of thrombosis; the incidence increases when abdominoplasty is combined with liposuction or some other type of procedure [4].

Extensive liposuction in the abdomen and lower extremities combined with prolonged procedures causes blockage of the venous system and the release of factors that contribute to thrombosis [5].

Several authors have identified various risk factors for thrombosis in aesthetic plastic surgery and believe the most important to be the following: the timing and complexity of

✉ Jesús Cuenca-Pardo  
jcuenca001@gmail.com

<sup>1</sup> Asociación Mexicana de Cirugía Plástica, Estética y Reconstructiva, Jerez número 51 colonia Mixcoac, delegación Benito Juárez, CP 03220 Mexico City, Mexico

the surgery; a history of prior thrombosis or thrombophilia; patient age; obesity; air travel prior to surgery; varicose veins and edema of the limbs; and pregnancy, puerperium, hormonal contraceptive intake or hormone replacement and family history of VTE [5, 6].

Most authors agree with the identification and prevention of risk factors for thrombosis; however, there is controversy regarding how to rate and treat these risk factors. There are several scores to rate the risk of thrombosis [7–9]. There are widely used scores, including the one proposed by the ACCP (chest), IMPROVE, Padua and Davison. There are large differences in terms of the number of factors that each score qualifies, the weighting of factors, the sensitivity and specificity of each scale and the stratification of risk and preventive care. Most scores do not include the risk of bleeding [9, 10]. The Caprini and Pannucci score is one of the most commonly used in surgical as well as non-surgical patients; it has contributed to the establishment of prophylactic care and to the decrease in the incidence of deep vein thrombosis and pulmonary thromboembolism [11, 12].

We have reported measures to prevent thromboses during aesthetic plastic surgery procedures and evaluated the cases of mortality related to thrombosis. For this reason, we wanted to compare the Caprini/Pannucci score in patients with and without thrombosis after plastic surgery.

The objective of the present work was to measure the impact of various risk factors for thrombosis and to calculate the sensitivity and specificity of the Caprini/Pannucci score in Mexican patients who underwent aesthetic plastic surgery procedures. With the results obtained, we suggest modifications of the score to make it more sensitive and useful for the stratification and prophylaxis of thrombosis in aesthetic plastic surgery patients.

## Methods

This was a retrospective study of patients and controls based on a review of the clinical records of patients operated on during the past 5 years, with aesthetic plastic surgery procedures performed by plastic surgeons who agreed to participate in the study. The plastic surgeons were contacted based on a list of physicians who agreed to answer a survey of thrombosis from the safety committee of the Asociación Mexicana de Cirugía, Plástica, Estética y Reconstructiva [3]. We collected data from 70 patients with thrombosis after aesthetic plastic surgery who were compared with 82 patients without thrombosis in the same group of surgeons. From the same survey, surgeons who reported no cases of thrombosis were invited to participate in the group II. The groups were determined to match for

comparison retrospectively as close as reasonably possible based upon the surgical procedure(s) performed.

The variables studied were as follows:

*Dependent variables* Thrombosis, pulmonary thromboembolism and deaths from thromboembolism. For operational purposes, we considered all cases of pulmonary thromboembolism and deep vein thrombosis as thrombosis.

*Independent variables* All factors included in the Caprini/Pannucci score and other factors not included in the score, including the duration of surgery, type of anesthesia used, amount of fat aspirated, fat infiltration in the buttocks and amount of fat infiltrated.

Variables calculated by the researchers with the data obtained from the files were as follows: number of procedures performed in each patient; rating and stratification of risk of thrombosis using the Caprini/Pannucci score; BMI (body mass index); and stratification of patients according to the duration (hours) of the procedure.

We carried out an analytical study comparing the two groups of patients. The first group consisted of those who experienced thrombosis, and the second consisted of those without thrombosis. All patients underwent aesthetic plastic surgery procedures. The variables were described by means of simple frequencies, proportions and measures of central tendency and dispersion of the measured variables. With the available variables, we determined the risk factors, correlations and linear regressions. The sensitivity and specificity of the Caprini/Pannucci score were calculated.

*Ethical aspects* This was a retrospective clinical study based on a review of clinical files without direct participation of the patients. Therefore, there was no risk to any patient, and the confidentiality of patients and surgeons was maintained. We declare that there are no conflicts of interest that may influence the results.

## Results

We studied 152 records of patients undergoing aesthetic plastic surgery procedures. We formed two groups: The first consisted of 70 patients who presented after surgery thrombosis (46.1%) and the second group consisted of 82 patients without thrombosis (53.9%). In the group of patients with thrombosis, there were 15 deaths due to pulmonary thromboembolism (21.42%).

*Rating of Caprini/Pannucci score* The patients with thrombosis had Caprini scores of 2–10 points, average  $5.68 \pm 2.01$ . Patients who did not have thrombosis had scores of 2–6 points, average  $3.45 \pm 1.06$ . There was a difference of 2.23 points ( $p < 0.001$ ).

*Sensitivity and specificity of the Caprini score* We analyzed two groups. The first group consisted of patients

with scores of 2 and 3 points, considered those without risk of thrombosis; the second group included patients with scores = or > 4 points, considered those at risk of thrombosis. The sensitivity was 75.71%, the specificity was 70.73%, the positive predictive value was 68.83%, and the negative predictive value was 77.33%.

*Score = or < 3 or 4 points* There were 58 patients with scores of 2 and 3; 11 of these patients (18.96%) had thrombosis.

*Score = or > 4 points* There were 94 patients with scores of 4 points; 59 (62.76%) of these had thrombosis, and 37.24% did not have thrombosis; the estimated risk for these patients was a 7.53-fold greater risk of thrombosis ( $p < 0.001$ , 95% CI 3.65–15.54).

*Score = or > 7 points* There were 31 patients with a score of 7 points; 30 of these presented with thrombosis, with an estimated risk of 60.75 ( $p < 0.001$ , 95% CI 7.994–461.653) and a 5.66-fold greater risk of death ( $p = 0.003$ , 95% CI 1.869–17.170).

*Linear regression between Caprini/Pannucci score and percentage of thrombosis* There were 9.86% more thromboses for each point in the Caprini score ( $R = 0.937$ ,  $R^2$  of 0.878,  $R^2$  corrected 0.860,  $p < 0.001$ ) (Fig. 1).

## Risk Factors

### 1. Type of surgical/aesthetic procedure and thrombosis

*Facelift* Twenty-two patients underwent this procedure; three experienced thrombosis, with 4.2% versus 51.53% of those who underwent other types of surgeries ( $p = 0.001$ , OR 0.148, 95% CI 0.042–0.526). The three patients with thrombosis, in addition to facial surgery, underwent abdominoplasty and liposuction. There were no deaths.

*Simple liposuction* Sixty-two patients were treated, and eight had thrombosis, 11.42% versus 68.88% of other procedures ( $p < 0.001$ , OR 0.67, 95% CI 0.028–0.159).

*Liposuction combined with another procedure that was not fat infiltration in the buttocks* These surgeries were

performed on 108 patients; 36.2% had thrombosis versus 75% with other procedures ( $p < 0.001$ , OR 0.492, 95% CI 0.292–0.951).

*Abdominoplasty* This surgery, as a single procedure or combined with local liposuction, was performed on 96 patients. Thrombosis occurred in 44.79% versus 48.21% of other procedures. There was no significant difference ( $p = 0.405$ ; OR 0.871; 95% CI 0.450–1.687). The abdominoplasty was conventional abdominoplasty without lipoabdominoplasty (no liposuction in the flap).

*Fat graft in the gluteus region* This procedure was performed on 20 patients; 80% presented thrombosis versus 39.13% of other procedures; 10.4 plus thrombosis risk ( $p = 0.000$ , 95% CI 3.098–34.909). The infiltrated amount was 200 to 800 cc, average  $220 \pm 218.4$  cc; there was no correlation between the volume and the percentage of thrombosis.

*Amount of aspirated fat* The amount of aspirated fat ranged from 2 to 8 L, average 3150 cc,  $\pm 1725$ . The aspirated body surface ranged from 10 to 40%, average  $16.18\% \pm 9.4\%$ . There was no correlation among the volume aspirated, the aspirated surface and the percentage of thrombosis.

*Type of anesthesia* In 66.44% of patients, regional or local anesthesia was used; general anesthesia was used in a total of 33.56% of patients. There were no significant differences in the incidence of thrombosis between the groups. In group I, regional anesthesia was used in 44 (62.85%) and general in 26 (37.14%) and in group II regional in 57 (69.51%) and general in 25 (30.48%).

*Number of surgical procedures* Group I (with thrombosis) had 1 to 5 procedures per patient, average  $1.81 \pm 0.96$ . Group II (without thrombosis) had 1 to 5 procedures via surgery, average  $3.04 \pm 1.29$ . There was no correlation between the number of procedures performed and the percentage of thrombosis.

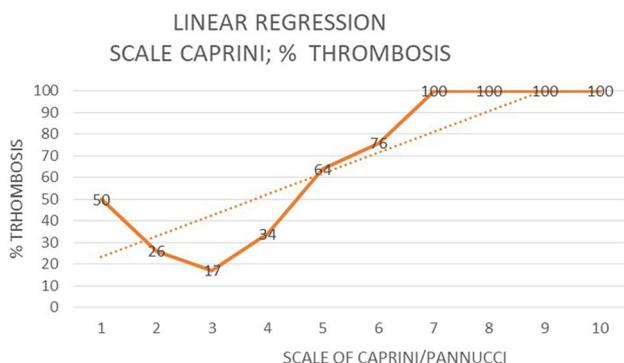
*Duration of the surgery* In patients with procedures lasting longer than 4 h, we found a 8.242-fold increase in thrombosis risk compared with those lasting less than 4 h ( $p = 0.001$ , 95% CI 1.824–37.255).

In the linear regression, between the duration of the surgery and the percentage of thrombosis we found a 13.73% increased thrombosis risk for each extra hour of surgery ( $R = 0.916$ ,  $R^2 = 0.840$ , corrected  $R = 0.787$ , Durbin–Watson = 2.666,  $p = 0.029$ ) (Fig. 2).

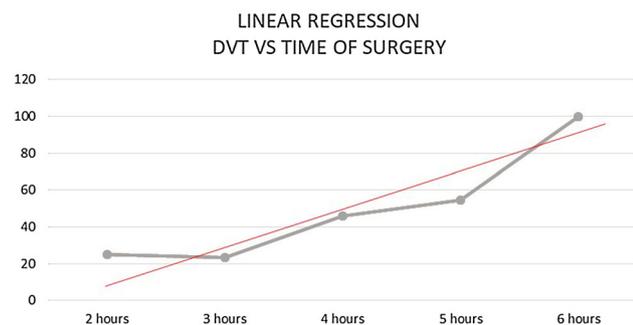
## Other Risk Factors

*History of coagulopathy (VTE)* Patients with a family history had a 5.8-fold higher risk of thrombosis; those with a personal background had a risk of 1.1 (Table 1).

*Obesity* Patients with obesity had a 5.466-fold higher risk of thrombosis ( $< 0.001$ ) (Table 1).



**Fig. 1** Linear regression Caprini scale and thrombosis



**Fig. 2** Thrombosis and time required for surgical procedure, longer times more risk of thrombosis

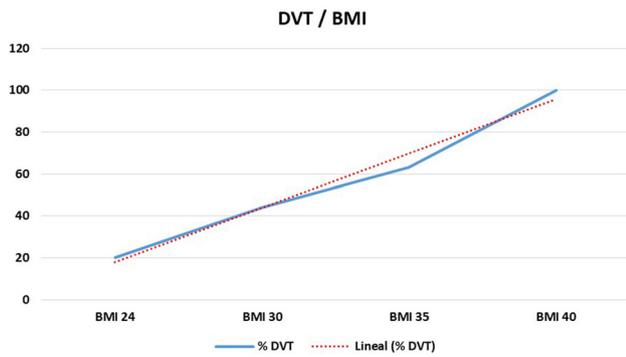
When performing linear regression between the percentage of thrombosis and the BMI (body mass index), we found 4.9% increased thrombosis for every 1 point of an increase in BMI ( $R = 0.995$ ,  $p = 0.005$ ) (see Fig. 3).

*Age of the patients* The age of the patients in group I (thrombosis) ranged from 20 to 50 years old, average  $35.60 \pm 7.9$ . In group II (without thrombosis), the age ranged from 25 to 55, average  $40 \pm 8.05$ . There was no significant difference between the two groups.

There were 35 patients less than 30 years old; 29 (82.85%) had thrombosis, while, among women more than 30 years old, 35.04% had thrombosis ( $p < 0.001$ ); the

**Table 1** Estimated risk factors (95% confidence interval)

Risk factor	% Thrombosis 1. Risk factor 2. Without risk factor	Significance	Estimated risk	95% Confidence interval
Family history VTE	1. 78.57% 2. 38.7%	$p = 0.000$	5.806	2.196–15.350
Personal history of VTE	SI: 50% NO: 45.83%	0.549	1.182	0.284–4.910
Obesity	1. 76.47% 2. 37.28%	0.000	5.466	2.267–13.123
Diabetes	1. 31.57% 2. 48.12%	$P = 0.134$	0.498	0.178–1.387
Immune disease	1. 50% 2. 45.83%	0.549	1.182	0.282–4.910
Smoking	1. 38.46% 2. 51.72%	$p = 0.072$	0.583	0.304–1.121
Hypertension	Yes: 31.81% NO: 48.46%	0.111	0.496	0.190–1.297
Heart disease	Yes: 57.14% NO: 45.51%	0.412	1.596	0.345–7.387
Lung disease	Yes: 57.14% NO: 45.51%	0.412	1.596	0.345–7.387
Anticonceptive pills	Yes: 52.63% NO: 42.10%	0.137	1.528	0.789–2.957
Child birth	Yes: 45.45% NO: 46.09%	0.609	0.974	0.284–3.341
Flight trip	Yes: 25% NO: 49.24%	0.035	0.344	0.118–1.000
Long trip by car	Yes: 17.24% NO: 52.84%	0.000	0.186	0.067–0.519
Long trip by bus	Yes: 16.66% NO: 47.26%	0.146	0.025	0.225–1.958
Mild venous insufficiency	Yes: 59.37% NO: 42.5%	0.067	1.977	0.895–4.370
Varicose veins	1. 100% 2. 37.28%	0.000	5.466	2.267–13.123



**Fig. 3** Linear regression thrombosis and BMI (body mass index)

estimated risk was 8.959 (95% CI 3.439–23.342). By statistically filtering thrombosis in patients less than 30 years old with other factors, we found that thrombosis was associated with infiltration of fat in the buttocks (OR 10.40,  $p < 0.001$ , 95% CI 3.09–34.90) and varicose veins (OR 2.083,  $p = 0.015$ , 95% CI 1.385–3.133). In terms of obesity, immune disease or childbirth, 100% developed thrombosis; for this reason, the OR could not be calculated nor could the significance be established. In patients older than 30 years, a history of coagulopathies, hormone ingestion, childbirth, collagen diseases or varicose veins was not risk factors for thrombosis (Fig. 3).

*Other factors without impact on the development of thrombosis* Diabetes, smoking, high blood pressure, heart disease, respiratory problems and trips by plane, car or bus were factors that did not impact the development of thrombosis.

## Discussion

The Caprini/Pannucci score is the most used scale to stratify the risk of thrombosis. This score has undergone several modifications to simplify it and to attempt to validate it [12]. Swanson stated that this score is a well-intentioned, logical score, but that it does not have the proper methodology. In addition, its sensitivity and specificity are very low and cannot be used as a guide for antithrombotic prophylaxis [13]. We found a 9.86% increased thrombosis risk for each point increase in the Caprini score; we also found that patients who had thrombosis had higher Caprini scores than those without thrombosis (5.68 vs. 3.45,  $p < 0.001$ ). Nevertheless, we agree with Swanson that the score has a low sensitivity and specificity. In our study, there was 75.71%/70.73% effectiveness of the Caprini score; we found that the score was effective in the high-score group. The greatest failure was found in the group with a low score (< 4 points), considered low risk, and the

use of chemoprophylaxis was not recommended. In this group, we detected 11 patients (18.96%) with thrombosis.

The Caprini/Pannucci score contains several factors that are not at all times present in elective aesthetic plastic surgery patients [11, 12]. These factors include orthopedic hip problems, cerebral vascular events, multiple myeloma and paralysis due to spinal cord injury. These factors do not include frequent thrombogenic factors in aesthetic plastic surgery patients, including multiple procedures, long-term procedures, liposuction and fat infiltration [5, 6, 14]. Thrombogenic factors should be omitted or included as a single item, while multiple procedures should be included in the score. Before doing so, however, these factors should be studied with a strict methodology to weigh the degree of risk and the score that corresponds to them. This approach will make the score more adaptable to our specialty with greater sensitivity.

The age of the patients is considered in the first three categories of the Caprini/Pannucci score: The older the age is, the higher the score is. In the groups studied, we did not find that increasing age was a risk factor for thrombosis. An important finding was the high incidence of thrombosis in women under 30 years of age, with an OR of 8.9. When filtering the database in this group of patients with other factors, we found that thrombosis was associated with the infiltration of fat in the buttocks, varicose veins, obesity, collagen diseases, estrogen ingestion and deliveries. We believe that in patients under 30 years of age, these variables should be included as high risk factors for thrombosis. Fat embolism is a problem that is gaining more attention. We conducted studies in cadavers to prevent this terrible complication. As we reported, the infiltration should avoid deeper structures by injecting in less than 32° and through the upper quadrants [15, 16].

The type of surgery (major or minor) is considered in the first two categories of the Caprini/Pannucci score. We found that patients who undergo procedures lasting longer than 4 h have a 8.242-fold increased risk of thrombosis compared with those lasting less than 4 h; we also found a 13.73% increased risk of thrombosis for each extra hour of surgery (see Fig. 3). It is important to mention that doing multiple procedures was not a risk factor, which means that multiples procedures can be done if completed in 5 h or less. The surgical factor must be qualified by the duration of the procedure: The longer the procedure is, the higher the score is.

Liposuction and fat infiltration have been considered risk factors for thrombosis [17, 18], and the Caprini/Pannucci score does not include these two factors. We found a 10.4-fold increase risk of thrombosis in patients who were infiltrated with fat in the buttocks ( $p < 0.001$ ) (see Fig. 2). This factor should also be included in the score.

**Table 2** The score Caprini's analyzed and used in the study

1 Point for each of the following statements that apply now or within the past month	<p>Statements</p> <ul style="list-style-type: none"> <li>Age 41–60 years</li> <li>Minor surgery (less than 45 min) is planned</li> <li>Past major surgery (more than 45 min) within the last month</li> <li>Visible varicose veins, a history of inflammatory bowel disease (IBD) (e.g., Crohn's disease or ulcerative colitis)</li> <li>Swollen legs (current)</li> <li>Overweight or obese (body mass index above 25)</li> <li>Heart attack</li> <li>Congestive heart failure</li> <li>Serious infection (e.g., pneumonia), Lung disease (e.g., emphysema or COPD)</li> <li>On bed rest or restricted mobility, including a removable leg brace for less than 72 h</li> <li>Current use of birth control or hormone replacement therapy (HRT)</li> <li>Pregnant or had a baby within the last month, History of unexplained stillborn infant, recurrent spontaneous abortion (more than 3)</li> <li>Premature birth with toxemia or growth restricted infant</li> </ul>
2 Points for each of the following statements that apply	<p>Statements</p> <ul style="list-style-type: none"> <li>Age 61–74 years</li> <li>Current or past malignancies (excluding skin cancer, but not melanoma)</li> <li>Planned major surgery lasting longer than 45 min (including laparoscopic and arthroscopic)</li> <li>Non-removable plaster cast or mold that has kept you from moving your leg within the last month</li> <li>Tube in blood vessel in neck or chest that delivers blood or medicine directly to heart within the last month (also called central venous access, PICC line, or port)</li> <li>Confined to a bed for 72 h or more</li> </ul>
3 Points for each of the following statements that apply	<p>Statements</p> <ul style="list-style-type: none"> <li>Age 75 years or over</li> <li>History of blood clots, either deep vein thrombosis (DVT) or pulmonary embolism (PE)</li> <li>Family history of blood clots (thrombosis)</li> <li>Personal or family history of positive blood test indicating an increased risk of blood clotting</li> </ul>
5 Points for each of the following statements that apply now or within the past month	<p>Statements</p> <ul style="list-style-type: none"> <li>Elective hip or knee joint replacement surgery</li> <li>Broken hip, pelvis or leg</li> <li>Serious trauma (e.g., multiple broken bones due to a fall or car accident)</li> <li>Spinal cord injury resulting in paralysis</li> <li>Experienced a stroke</li> </ul>

Confinement to bed is considered in two categories (I and II) but does not value the degree of mobility and participation of patients. In our study, we did not include these factors; however, they are determinants in the incidence and prophylactic management of thrombosis and should be included in the score. A prospective cohort study should be carried out to weigh these factors and determine their importance.

In the score, obesity is represented by a BMI greater than 25 and is only considered in the first category. We found that patients with obesity had a 5.466-fold higher

risk of thrombosis ( $< 0.001$ ) and a 4.9% increased risk of thrombosis for every point increase in BMI. We believe that obesity should be included in all categories: The greater the obesity is, the higher the risk of thrombosis is [5, 19, 20].

Patients with a family history of thrombophilia had a 5.8-fold higher risk of thrombosis. Personal history of thrombosis was not a risk factor. This is another factor that we have to study in the future [5]. Unfortunately, patients were not tested for hematological etiology such as factor V

**Table 3** Risk factors that may be considered to add in the case of aesthetic plastic surgery

Statements that can be considered for our specialty
Timing of the procedure more than 2 h, between 2 and 5 h and more than 5 h
Abdominoplasty, liposuction, especially if fat graft to the gluteus is considered
Other factors not considered in the study but should be analyzed patient with massive weight loss

Leiden deficiency. It was a retrospective study, and future studies should rule out this type of condition.

Other factors that had no impact were diabetes, smoking, high blood pressure, heart disease, respiratory problems, air travel and type of anesthesia used. This outcome was different from that of other reports [21–23] (see Table 1). Controlled clinical studies are required to determine the relationship of these factors with the production of thrombosis. While we do not have the data, these factors cannot be removed from the Caprini/Pannucci score [24, 25].

There are different risk assessment models for thromboprophylaxis, not only Caprini, as, for example, four elements, full logistic model, Geneva, IMPROVE, Kucher, Padua and others. Every model evaluates different things. Each of them has been probed in different studies around the world.

As we discussed before, Caprini evaluated and rated each risk factor. It seems to be one of the most complete. As we mentioned, other factors are not evaluated in the case of aesthetic plastic surgery [26].

In the case of the Geneva risk score, other factors are considered that may be applied to an aesthetic plastic surgery procedure, for example, hormonal therapy, dehydration, BMI, recent travel or immobilization that can adapt in our practice [27].

The Padua predictive score takes into account recent surgery, previous venous thromboembolism, age or obesity [28]. Cancer is included in different models as, for example, Kucher, IMPROVE or the multivariable model. It is important to mention that besides breast reconstruction or other reconstructive procedures, it is less likely that we can propose to do an elective procedure with this risk factor [29–31].

We agree that none of the risk assessment models fulfills the criteria, and in our practice, other factors need to be validated [32].

With the data obtained in the present work, we will be able to make changes in the Caprini/Pannucci score for use in the risk rating of thrombosis in aesthetic plastic surgery patients. These modifications must be validated and their consistency determined in future studies (Tables 2 and 3).

We should mention to our readers that this is a multi-centre retrospective study where many variables were difficult to control. This study comes from a survey that as a

committee of safety helps to reduce complications. At this moment, we count more information that we did not have at the time of the study. The complications in aesthetic plastic surgery can be managed in three episodes: before, during or after the procedure. This study helps in the first episode. We want to focus on better selection of patients and less risk in the procedures.

As a group after working in different surveys and complicated cases with the membership, we found a high incidence of complications, some of them fatal than usual. At the moment of the study, we did not have information about risk zones for fat embolism or the difference in macroscopic fat embolism or microscopic fat embolism [33]. We are aware that some cases maybe were diagnosed as thrombotic disease but the cause probably was fat embolism. More studies are needed to keep our specialty free of complications and safer.

## Conclusion

In the present study, we found several factors included in the Caprini/Pannucci score with no or minimal impact on the risk of thrombosis in patients undergoing elective aesthetic plastic surgery procedures. Some of the factors are weighted with a high score, while others in the present study had a high impact and were not included in the score.

The Caprini/Pannucci score in the present work had the greatest utility in cases of high scores and the highest failure in those with low scores. Many patients with low scores developed thrombosis. The score has low sensitivity and specificity. To increase its effectiveness and take it as a basis for deciding prophylactic care, it is necessary to modify the score and add some factors. The modifications that are to be made must be validated to demonstrate their effectiveness and consistency. The modified Caprini/Pannucci score may be very useful in stratifying the risk of thrombosis in aesthetic plastic surgery patients and in the implementation of prophylactic care.

## Compliance with Ethical Standards

**Conflict of interest** The authors declare that they have no conflict of interest.

**Ethical Approval** The study was approved by the Committee de Seguridad de la Asociación Mexicana de Cirugía Plástica, Estética y Reconstructiva.

**Human and Animal Rights** This was a retrospective clinical study based on a review of clinical files without direct participation of the patients. Therefore, there was no risk to any patient, and the confidentiality of patients and surgeons was maintained.

**Informed Consent** For this type of study, informed consent is not required.

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