

## Article

# Preoperative assessment in low complexity outpatient dermatologic surgery

## Avaliação pré-operatória na cirurgia ambulatorial dermatológica de baixa complexidade

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**ABSTRACT:** *Introduction:* The preoperative evaluation provides data about the patient, which will help in the preparation of the surgery. In outpatient, low-complexity surgeries, the criteria for carrying out this evaluation are not well defined in the guidelines. *Objective:* to compare assessment strategies and their impact on perioperative evolution. *Method:* Prospective and controlled study in dermatologic surgery. Low and moderate risk patients were included according to the EMAPO score (Multicenter Perioperative Evaluation Study for Non-Cardiac Surgery). Divided into two groups: (G1) evaluation with the surgeon; (G2) evaluation with surgeon and cardiologist. Seven-day follow-up. Data on the procedure, evolution and adverse events were analyzed. Statistical evaluation: Shapiro-Wilk. Pearson's  $\chi^2$  test and T or Mann-Whitney test (95% CI with  $P < 0.05$ ). *Results:* 299 patients evaluated (G1=200 and G2=99). All cleared for surgery, without any special guidance. Homogeneous groups, EMAPO (G1=2.6  $\pm$  3.6 and G2=2.7  $\pm$  3.2), except for dyslipidemia (G1=13.5% and G2=23.2%  $p=0.03$ ). There were no cardiovascular events. Three patients in G2 and one in G1 had surgical wound infection. G2 patients underwent more tests (5.1  $\pm$  1.7 vs 1.3  $\pm$  1.7;  $p < 0.01$ ). The waiting time for the surgery was shorter in G1 (2.7  $\pm$  2.1 months) compared to G2 (6.8  $\pm$  4.6m) ( $p < 0.01$ ). *Conclusion:* There is no need for preoperative evaluation with a cardiologist and/or more tests in low or medium risk patients according to the EMAPO score for outpatient dermatological surgeries.

**RESUMO:** *Introdução:* A avaliação pré-operatória fornece dados sobre o paciente, que irão auxiliar no preparo da cirurgia. Nas cirurgias ambulatoriais, de baixa complexidade, os critérios para a realização dessa avaliação não são bem definidos nas diretrizes. *Objetivo:* comparar estratégias de avaliação e seu impacto na evolução perioperatória. *Método:* Estudo prospectivo e controlado em cirurgia dermatológica. Incluídos pacientes de baixo e moderado risco pelo score EMAPO (Estudo multicêntrico de avaliação perioperatória para operações não cardíacas). Divididos em dois grupos: (G1) avaliação com o cirurgião; (G2) avaliação com cirurgião e com cardiologista. Seguimento de sete dias. Analisados dados sobre o procedimento, evolução e eventos adversos. Avaliação estatística: Shapiro-Wilk. Teste  $\chi^2$  de Pearson e teste T ou Mann-Whitney (IC 95% com  $P < 0.05$ ). *Resultados:* 299 pacientes avaliados (G1=200 e G2=99). Todos liberados para cirurgia, sem nenhuma orientação especial. Grupos homogêneos, EMAPO (G1=2.6  $\pm$  3.6 e G2=2.7  $\pm$  3.2), exceto pela dislipidemia (G1=13,5% e G2=23,2%  $p=0,03$ ). Não houve eventos cardiovasculares. Três pacientes do G2 e um no G1 tiveram infecção de ferida operatória. Os pacientes do G2 realizaram mais exames (5.1  $\pm$  1.7 vs 1.3  $\pm$  1.7;  $p < 0.01$ ). O tempo de espera para a realização da cirurgia foi menor no G1 (2.7  $\pm$  2.1 meses) em relação a G2 (6.8  $\pm$  4.6m) ( $p < 0.01$ ). *Conclusão:* Não há necessidade de avaliação pré-operatória com cardiologista e/ou mais exames em pacientes de baixo ou médio risco pelo score EMAPO para cirurgias dermatológicas ambulatoriais.

**KEYWORDS:** Perioperative Care, Cardiovascular Risk, Heart Complications.

**PALAVRAS-CHAVE:** Assistência perioperatória; Risco Cardiovascular; Complicações Cardiovasculares.

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## INTRODUCTION

Outpatient surgery is one of the largest areas of surgical and anesthetic practice<sup>1</sup>. They are low complexity procedures with local anesthesia, with or without sedation, and 70% of them occur in an outpatient setting<sup>1</sup>. It has an incidence of adverse events of less than 1%<sup>2</sup>. Despite this, patients are submitted to a preoperative evaluation to prepare them for the procedure and reduce perioperative risks<sup>3</sup>.

This evaluation can be performed only with the surgeon or concomitantly with other specialists, with or without the request for complementary exams. Preoperative evaluations without a previously well-defined clinical criterion do not reduce the incidence of adverse events and increase patient wear and costs to the health system<sup>4</sup>. Health care providers spend about US\$ 150 million per year with preoperative evaluation, money that could be saved and invested in more health care investments<sup>5</sup>. Some authors report that 60-70% of the tests ordered are unnecessary.<sup>4</sup> A clinical study<sup>5</sup> of 19,354 patients scheduled for cataract surgery evaluated whether preoperative examination would reduce complication rates during the perioperative period. They randomized the patients into two groups: one that would perform preoperative examinations and one that would not. Balancing the groups, it was concluded that such exams are not necessary, as no differences were found regarding adverse events or surgical or post-surgical complications.

To increase the efficiency of the preoperative evaluation, the Cardiology Societies seek through guidelines to help and guide physicians. The Brazilian Society of Cardiology defines in the III Guideline of Perioperative Cardiovascular Evaluation<sup>2</sup>, which is aligned with the guidelines of the American Heart Association<sup>6</sup>, a general preoperative evaluation and a supplementary one according to the results obtained in the general evaluation and by previous comorbidities of the patients, seeking to classify the patient as high, intermediate, or low risk<sup>7</sup> through pre-established scores.

In Brazil and around the world, in general, most physicians do not adhere to the guidelines and many consider the evaluation of another professional and some complementary exams as essential, as parameters for detecting subsequent changes, even knowing little about their effectiveness for this function<sup>8</sup>. Thus, this study will seek, through a randomized and controlled sample, to verify the relevance and effectiveness of performing the preoperative evaluation in outpatient dermatologic surgeries, comparing the strategies of preoperative evaluation exclusively with the surgeon or concomitant with the cardiologist in the perioperative evolution of these patients.

## MATERIALS AND METHODS

This is a longitudinal, randomized, controlled study with patients who underwent dermatologic outpatient

surgery. The interventions were performed with local anesthesia, with or without supplementation by sedation with opiates, benzodiazepines or etomidate, according to the need indicated by the anesthesiologist. The procedures followed the service routine.

Patients were recruited, regarding age and EMAPO<sup>9</sup> cardiovascular risk score, between September 2019 and April 2020. The EMAPO score was chosen because it is national and has already been validated. Patients older than 18 years who agreed to participate in the study were included. Patients who did not want to participate or who were considered to be at high or very high cardiovascular risk (EMAPO > 10)<sup>9</sup> were excluded. All patients signed an informed consent form. A patient who withdrew from surgery or was not located within 30 days after surgery with multiple contact attempts was considered a lost segment.

Each patient was randomly assigned to the group that would perform the preoperative evaluation with the surgeon only (Group 1 - G1) or to the group that would also perform it with the cardiologist (Group 2 - G2). Randomization was performed by a computer in the proportion of 2:1 (group 1 and group 2, respectively). For patients in whom the need for tests was evaluated, it was up to the doctor responsible for the preoperative period to request them, and the following tests were included in the study: chest X-ray, 12-lead ECG, complete blood count, coagulogram, glycemia, urea, creatinine, and electrolytes. The study did not impose any other requirements in the preoperative medical evaluation.

Baseline and preoperative data were collected using a standardized questionnaire, filled out at the time of the preoperative consultation with the attending physician. Coexisting diseases and medications used were confirmed in the patient's chart during the consultation. Intraoperative medical events and treatments were recorded on a standardized form by the anesthesiologist or head nurse and attached to the medical record. Postoperative information (including subsequent hospitalizations, unscheduled visits to a physician, or death) was collected by standardized interview via telephone or at a follow-up visit.

The primary outcome considered was the occurrence of any adverse event related to surgery or clinical or cardiovascular events as defined in Table 1. The risk of study participation was considered minimal. Other risks would be related to secrecy and confidentiality issues. Although there was no guarantee of direct benefit to the participant, there would be a collective benefit by better understanding the impact of different preoperative assessment strategies. The study began after approval by the Research Ethics Committee (REC), protocol number 3480651 (CAAE: 15809419.2.0000.0082).

**Table 1** - Adverse Events<sup>10</sup>.

Adverse Event	Definition
Hypertension	Increase in systolic pressure to $\geq 180$ mmHg or in diastolic pressure to $\geq 120$ mmHg
Hypoglycemia	Blood glucose level low enough to require intravenous replacement
Hemorrhage	Patients with Hb < 9 and Ht < 30%.
Hypotension	Decrease in systolic pressure to $\leq 90$ mmHg or in diastolic pressure to $\leq 60$ mmHg
Acute Myocardial Infarction	Chest pain, ECG changes (ST segment changes, new Q wave), changes in markers of myocardial necrosis or new bundle branch block on ECG
Hospitalization in the immediate postoperative period	Admitted to the emergency room or hospitalized within 7 days of surgery presenting with a surgery-related condition
Congestive Heart Failure	Previous or anesthesiologist-reported diagnosis or in the recovery room of dyspnea with edema on chest X-ray

Statistical Analysis - A sample size of 300 participants or 1% adverse events was expected. Events were expected to occur in the same proportion in both groups. Proportions of baseline characteristics were calculated for each group and data expressed as number and percentage (%) of patients for categorical variables and as mean and standard deviation (SD) (if normally distributed) or median with interquartile range (IQR) (if non-normally distributed) for continuous variables. Variables were assessed for normal and non-normal distribution by the Shapiro-Wilk test. Pearson's  $\chi^2$  test was used to compare categorical variables and Student's t-tests to compare the results for normally distributed continuous variables. Results for non-normally distributed continuous variables were compared by the Mann-Whitney U-test. A P value  $\leq 0.05$  indicated statistical significance for a 95% confidence interval.

## RESULTS

Three hundred and thirty-seven patients were

evaluated, and thirty-eight were excluded for being in disagreement with the randomization or for loss of segment (abandonment of treatment), thus continuing with 299 patients. The population was mostly female, over 63 years of age, and most had incomplete elementary school education. One hundred and ninety-five (65.21%) participants had some comorbidity or were on continuous use of some medication. The main comorbidity reported was hypertension, followed by smoking and dyslipidemia (Table 2).

When comparing the groups that underwent only the surgery (G1) with the group that also consulted the cardiologist (G2), there were no significant differences between the populations regarding age, cardiovascular risk according to EMAPO score and comorbidities, except for Dyslipidemia ( $p = 0.034$ ), with 23% of the sample in group G2 and 13% of the sample in group G1, which occurred at random (Table 2).

**Table 2** – Clinical and Epidemiological Description.

Features	Group 1 (N=200)	Group 2 (N=99)	Total (N=299)	p
Age in Years (sd)	60.6 $\pm$ 1.7	65.5 $\pm$ 1.7	63	0.067
<b>Ages – N° (%)</b>				
<53 years	56 (28%)	14 (14.14%)	70 (23.14%)	
53 – 63 years	39 (19.5%)	28 (28.28%)	67 (22.40%)	
63-73 years	54 (27%)	27 (27.27%)	81 (27.09%)	
$\geq 73$ years	51 (25.5%)	30 (30.30%)	81 (27.09%)	
<b>Gender – N° (%)</b>				0.913
Female	128 (64%)	64 (64.64%)	192 (64.21%)	
Male	72 (36%)	35 (35.35%)	107 (35.78%)	
<b>Education – N° (%)</b>				
Postgraduate	2 (1%)	1 (1.01%)	3 (1.00%)	
Complete College	26 (13%)	12 (12.12%)	38 (12.70%)	
Incomplete College	11 (5.5%)	-	11 (3.67%)	
Complete High School	60 (30%)	27 (27.27%)	87 (29.09%)	
Incomplete High School	8 (4%)	4 (4.04%)	12 (4.01%)	
Complete Elementary School	30 (15%)	17 (17.17%)	47 (15.71%)	
Incomplete Elementary School	54 (27%)	35 (35.35%)	89 (29.76%)	
Literate	3 (1.5%)	-	3 (1.00%)	
Illiterate	6 (3%)	3 (3.03%)	9 (3.01%)	
<b>Comorbidities/Habits – N° (%)</b>				
None	73 (36.5%)	31 (31.31%)	104 (34.78%)	
Yes	128 (64%)	68 (68.68%)	195 (65.21%)	
Arterial Hypertension	93 (46.5%)	47 (47.47%)	140 (46.82%)	0.874
diabetes mellitus	29 (14.5%)	19 (19.19%)	48 (16.05%)	0.298
Dyslipidemia	27 (13.5%)	23 (23.23%)	50 (16.72%)	0.034
Cardiovascular disease	16 (8%)	14 (14.14%)	30 (10.03%)	0.096
smoking	39 (19.5%)	19 (19.19%)	58 (19.39%)	0.949
<b>EMAPO</b>	2.6 $\pm$ 3.6	2.7 $\pm$ 3.2		0.633

The surgeries were performed under local anesthesia, with or without sedation, were varied, ranging from cosmetic procedures to resections of carcinomas. All procedures had the same level of complexity (outpatient) and the same operative risk (low).

In the comparison between the two groups, the number of exams presented a significant difference ( $p < 0.01$ ), as well as the waiting time. Overall, the patients took a mean of three months to perform the surgery ( $SD \pm 1.5$  months) and a mean of 2.5 exams ( $SD \pm 2.49$  exams). The average waiting time in group 1 was 60% less than in group 2, and the average number of exams was 75% less than in group 2 (Table 3).

**Table 3** - Analysis of variables by group.

Variables	Group 1	Group 2	p
Waiting time - months (median- SD)	2.7 $\pm$ 2.1	6.8 $\pm$ 4.6	< 0.01
number of exams (median - SD)	1.3 $\pm$ 1.7	5.1 $\pm$ 1.7	< 0.01

We also observed that many of the patients had their waiting times for surgery reduced due to better financial condition, their own or of relatives, which allowed them to have private consultations and exams to speed up the time to return and schedule the procedure. They made up 7.07% of the members of group 2 and 2.5%, of group 1 (4.01% of the whole sample). This reduced the average waiting time of these patients by 33.33%, with an average of 1 month waiting time in group 1 and 2 months in group 2.

There was no statistically significant difference in adverse events between the groups in the perioperative period. Four events were reported all in group 2. Three were surgical wound infections, which were not included in the statistical analysis because they were not among the outcomes analyzed. And only one non-sustained hypertensive peak (180 x 90 mmhg) of spontaneous resolution and without the need for interruption of the procedure or intervention, representing less than 1% of cardiovascular outcomes in the sample. This outcome occurred in a smoker patient, without other comorbidities, released by surgeon and cardiologist.

## DISCUSSION

In the present study, we evaluated patients who underwent outpatient dermatologic surgeries (low surgical risk) and who had a preoperative evaluation only with the surgeon or with the cardiologist as well. Despite being conceptualized as low-complexity procedures, several exams and preoperative cardiac evaluations are still requested, and there are few studies on the effect of preoperative dermatologic surgeries and the implications in their outcomes; therefore, this procedure was chosen for

analysis in our study<sup>11</sup>.

We observed a significant difference in the number of exams between the groups, as well as in the waiting time to perform the surgery. On the other hand, preoperative and surgical management, as well as perioperative adverse events, were not statistically significant. Multiple studies with outpatient ophthalmologic surgeries, especially cataract surgeries, have verified that the preoperative evaluation, with or without exams, with other specialists or not, did not modify the outcomes or management of the procedure<sup>4,5</sup>. Two studies stand out.

The first<sup>5</sup> sought to determine whether the preoperative evaluation would reduce the incidence of perioperative medical complications in cataract surgery. It randomized 19557 cataract surgeries of 18189 patients from 9 centers into two groups. One is preceded by preoperative evaluation with complementary tests (ECG, complete blood count, electrolytes, urea, creatinine and glucose) and the other without evaluation. They collected data on perioperative adverse events. 9626 surgeries were not preceded by preoperative evaluation and 9624 surgeries were. Hypertension and arrhythmia were the main comorbidities present. The complication rate in both groups was the same 31.3 events/1000 surgeries. There was no significant difference between the groups about intraoperative (19.2 and 19.7/1000 respectively) and postoperative (12.6 and 12.1/1000 respectively) complication rates. Stratifying by age, sex, race, performance status, and medical history did not reveal a benefit of the preoperative evaluation, concluding that it did not increase the safety of performing the procedure.

The second study<sup>4</sup> with 968 patients who underwent cataract surgery between 2006 and 2010. Two hundred and forty patients underwent preoperative evaluation and 728 were only evaluated by the physician who would perform the procedure. The same protocol was used in our study. Those who did not perform the preoperative waited an average of 2 months to perform the surgery, while those evaluated waited an average of 6 months. No cardiovascular events were reported in either group, and there was no difference between the groups in the rate of surgical or clinical adverse events during the entire perioperative period. He concluded that preoperative assessment implemented to reduce perioperative adverse effects only increased the surgical waiting time to 4 months longer. Similar data was found in our work with dermatologic surgery.

The adverse event rate recorded in our study (< 1%) is the same differences found in the literature on outpatient ophthalmologic surgeries. The waiting time showed a difference of 4 months between the groups, with no change in conduct or outcome of the procedures. The fact that one group was evaluated by more than one professional automatically could explain the increase in waiting time and in the number of exams requested. Even



so, the evaluation with the cardiologist and the number of tests requested did not imply changes in the outcomes of patients, since the only cardiovascular outcome, even if minor, occurred exactly in the group with greater medical assistance, confirming what has already been exposed in literature.

The only adverse event recorded in our study occurred in a patient who did not present previous hypertension, was a smoker, did not take regular medication, or had undergone any previous surgical procedure. This outcome was not statistically significant in the analysis, confirming a complication rate of less than 1%, a parameter already consolidated in the literature for outpatient surgical procedures<sup>2</sup>. The presence of more dyslipidemias (23%) in group 2 did not interfere in the cardiovascular outcome.

Thus, we observed that the preoperative evaluation did not predict the complications, nor did it change the risk of complications or the need for interventions that could prevent them, and did not prevent the outpatient procedures. The presence of more outcomes considered unfavorable, including a cardiovascular one, in the group of patients evaluated by the cardiologist, reinforces that such referral did not generate a difference in the performance or not of the procedures. No case required preoperative intervention or was referred with specific guidance from the cardiologist, besides the maintenance of previous treatment, if the patient had already undergone one.

The tests requested, despite being of low complexity and more accessible, end up increasing the demand on the health system. The waiting time between the evaluation and the surgery was a frequent complaint among patients in group 2. And it was what generated the abandonment of follow-up in the study, configuring a loss of follow-up > 10% of the sample, according to the questioning made to the patients who gave up the procedure.

The most frequently requested exams were: complete blood count, electrolytes, fasting glycemia, urea and creatinine. In the cases of lipomas, an ultrasound of the region was performed. In group 2 patients, besides the aforementioned blood tests, chest X-rays and electrocardiograms were performed. Only three of these patients had to undergo an echocardiogram requested by the cardiologist, which increased even the interval for the procedure to be performed and did not change the management of the procedure.

Probably, the excess of tests in G2 corroborated the increased waiting time and, likewise, the increased costs of

these patients to the health system. The findings of our study are in accordance with the world literature, which reports that the preoperative evaluation for outpatient surgeries of low complexity does not predict perioperative events, with no need to request it for all patients. Thus, because they are low surgical risk procedures, patients with low and intermediate cardiovascular risk would not need the evaluation. Thus, it would be enough to use the EMAPO score to define the classification and, finally, to perform the exams and preoperative consultations or not.

### Limitations

The loss of follow-up > 10% of the sample did not imply significant population differences, except for dyslipidemia, which occurred at random. Differences between patient samples can be found in other studies such as “The impact of preoperative evaluation on perioperative events in patients undergoing cataract surgery: a cohort study<sup>4</sup>, which showed a 75% discrepancy of participants between groups but maintained significant results in agreement with the literature. This event may be related to the fact that the randomization applied in this study was 2:1, leaving room for this occurrence.

The mean waiting time of group 2 found in the study was close to the mean found in group 1, despite the statistically significant difference. However, we can infer that if all the participants had used only the public health system, the difference between the waiting times of the groups would be greater than the 60% found in this study.

Despite the studies described with ophthalmologic surgery and ours described with dermatologic surgery, there remains the need to carry out a project with a greater diversity of outpatient surgeries that will benefit from the concepts found here. This should be a prototype study for dermatologic procedures in terms of the analysis of complications and a study that demonstrates that preoperative evaluation does not predict outcomes and changes in management, as well as the increase in waiting time and the number of exams.

### CONCLUSION

The performance of preoperative evaluation by a cardiologist, in addition to the surgeon, did not modify the perioperative management or surgical outcome in patients of low and intermediate cardiovascular risk, according to the EMAPO score, undergoing dermatologic outpatient surgery.

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