Ecchymosis evaluation after internal and external continuous lateral nasal osteotomy in open rhinoplasty

Avaliação da equimose após osteomotia nasal lateral contínua interna e externa na rinoplastia aberta

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Introduction: The objective is to evaluate the presence of ecchymosis 7 and 15 days after internal and external lateral nasal osteotomy in open rhinoplasty. Methods: A prospective evaluation of 15 patients who underwent open rhinoplasty with lateral nasal osteotomy was conducted. The patients were allocated into two groups. Those who underwent external lateral nasal osteotomy were included in group A (n = 6), while those who underwent internal osteotomy were included in group B (n = 9). The patients were evaluated on postoperative days 7 and 15, and the presence or absence of ecchymosis was recorded. Results: In group A, we observed that on postoperative day 7, 3 patients (50%) had ecchymosis and 3 (50%) showed no changes in skin color. On postoperative day 15, the same group had 2 patients (25%) with ecchymosis and 4 (75%) without changes. On the other hand, in group B, 3 patients (33.4%) had ecchymosis and 6 (66.6%) showed no changes on postoperative day 7. In the same group, 1 patient (11.1%) had ecchymosis and 8 (88.9%) showed no changes 15 days after surgery. Conclusion: Despite the lower incidence of ecchymosis in internal fractures on postoperative days 7 and 15, no statistical significance was observed between the two techniques.

Keywords: Rhinoplasty; Osteotomy; Nose; Ecchymosis.
INTRODUCTION

Lateral nasal osteotomy may be required during various aesthetic and restorative rhinoplasties and can be performed in many ways. Much has been discussed about the most appropriate technique to perform lateral osteotomy. Currently, the most commonly used techniques are internal continuous and external percutaneous osteotomy. Both techniques involve blind manipulation, which can cause mucosal injury, which is associated with bleeding and local swelling.

Depending on the severity of the edema and ecchymosis, it is difficult for the patient and surgeon to perceive the outcome, as the technique may also lead to a prolonged recovery time and interruption of patients’ social life during that period. Patients’ desire for rapid recovery and quick return to normal activities has influenced surgeons to opt for less morbid and minimally invasive techniques. Among the alterations that occurred with surgical trauma, ecchymosis and edema attracted the most patient attention. In this context, assessing which nasal osteotomy presents a lower degree of ecchymosis in the postoperative period aims at guiding the surgeon in choosing the technique with a shorter time to recovery.

OBJECTIVE

To evaluate the presence of ecchymosis after external and internal lateral nasal osteotomy in patients who underwent open rhinoplasty, on postoperative days 7 and 15.

METHODS

In the period from April to November 2016, a prospective evaluation of patients who underwent open rhinoplasty with continuous lateral nasal fracture was conducted. All the patients underwent operation at the plastic surgery residency service of Barata Ribeiro Municipal Hospital, in Rio de Janeiro, RJ. Those who underwent external and internal lateral continuous nasal osteotomy (Figures 1 and 2, respectively) were included in groups A and B, respectively.

The allocation of each patient was in accordance with the day of the week on which the operation was performed. Those who underwent operation on even days were assigned to group A, while those who underwent operation on odd days were assigned to group B. Patients who had comorbidities or were taking drugs that could interfere with bleeding or coagulation processes were excluded. African patients were also excluded because of the difficulty to analyze for the presence of ecchymosis.

The fracture type was standardized as all “low-to-low,” with paramedian fracture associated with cases that presented to no ceiling opening. The first author, under the guidance of a staff surgeon, performed all the fracture-related procedures, except that which was performed, for some reason, by the supervisor.
adrenaline – 1 ml) on both sides, followed by periosteal elevation and, finally, osteotomy.

During anesthetic induction, a 4-mg dose of dexamethasone was administered to all the patients for antihematic effects. Postoperative care was also standardized by prescribing high headboard and cold compress on the eyes for 15 minutes every 4 hours under nursing care. The patient was advised not to use any product that would interfere with edema or ecchymosis.

In the postoperative prescriptions, only dipyrone as an analgesic at a dose of 1 g every 4 hours and cefazolin as an antibiotic at 1 g every 8 hours were administered in the first 48 hours. No anti-inflammatory drugs were used in the postoperative prescriptions. A nasal tampon was also placed at the end of surgery, with dressings moist with the same solution as in the previous infiltration and removed after 48 hours. Dressing with Micropore and Aquaplast were then maintained until postoperative day 7.

The patients included in the study were evaluated on postoperative days 7 and 15 during outpatient consultation to define the presence or absence of ecchymosis. The results were then recorded in a protocol datasheet. The presence of ecchymosis was defined when the patients presented changes in skin color according to the Legrand du Saulle ecchymotic spectrum in the periorbital nasal or maxillary region (Figure 3). The absence of ecchymosis was defined when no skin color change was observed in these regions (Figure 4). The presence or absence of ecchymosis was evaluated in all the cases by the main author.

All the patients signed an informed consent form. The obtained data were organized in 2 × 2 contingency tables and analyzed using the Fisher exact test. The method was a nonparametric data approach that was aimed at assessing whether two independent samples are from the same population and especially designed for small samples.

The null hypothesis (H₀) indicates no significant difference in ecchymosis occurrence rate according to the adopted surgical procedure. The alternative hypothesis (H₁) indicates that the ecchymosis occurrence rate depends on the adopted surgical procedure. The Fisher exact test is based on a hypergeometric distribution. Therefore, the p value depends on the marginal totals in the table and, consequently, on the group sample values. The significance alpha level adopted was 0.05, so p values of <0.05 indicated rejection of H₀. The statistical packages used were BioEstat 5.3 and Statistica 8.0 (StatSoft, Inc.2007).

RESULTS

The total number of patients who underwent operation was 21 (n = 21). All underwent open rhinoplasty.
years, with an average of 28 years, in group A and from 16 to 49 years, with an average of 32 years, in group B. In group A, 5 patients (71.4%) were female and 2 (28.6%) were male. In group B, 8 patients (88.9%) were female and 1 (11.1%) was male.

In group A, we observed on postoperative day 7 that 3 patients (50%) had ecchymosis and 3 (50%) showed no changes in skin color. On postoperative day 15, the same group presented 2 patients (25%) with ecchymosis and 4 (75%) without changes. On the other hand, in group B, 3 patients (33.4%) had ecchymosis and 6 (66.6%) showed no changes on postoperative day 7. In the same group, 1 patient (11.1%) had ecchymosis and 8 (88.9%) showed no changes 15 days after surgery (Figure 5).

After assessing the proportions of the results, no significant differences were observed in the occurrence of ecchymosis depending on the fracture-related procedure performed (Tables 1 and 2).

**DISCUSSION**

As a main rhinoplasty component, lateral nasal osteotomy is considered the main cause of edema and ecchymosis during the postoperative period. This, however, aims at closing the open ceiling, narrowing the wide nasal dorsum, or correct irregularities. To achieve one of these goals with osteotomy, the procedure can be performed in 3 ways as follows (Figure 6): low-to-high, low-to-low, and double level, among which the latter is associated with paramedian fractures. In this study, we chose to maintain the most frequently used technique in the service routine, that is, the low-to-low form with associated paramedian fracture, both for internal and external fractures.

The use of narrowing osteotomes in the study was aimed at reducing the swelling and ecchymosis during the postoperative period. This was already demonstrated initially by Thomas and Griner in a study with narrowing osteotomes in corpses, which showed the benefit of preserving the nasal support, consequently causing less swelling and ecchymosis. Soon after, Tardy and Denneny found similar advantages when using 2- to 3-mm osteotomes. Kuran et al. showed a statistically
In addition, three other studies identified no significant difference between the techniques, with a tendency of favoring internal osteotomy\textsuperscript{17-19}. Tirelli et al.\textsuperscript{20} proposed fracture techniques with ultrasonic instruments and obtained satisfactory results. However, the availability of these tools to be used in our current clinical practice is still limited.

In view of the data initially obtained, together with the results of the meta-analysis performed by Ong et al.\textsuperscript{6}, published in 2016, by analyzing the aforementioned works, we can infer that the appropriate osteotomy is the technique performed by a surgeon with precise control. Indeed, it presents outcomes with a low risk of complications, minimizing postoperative sequelae such as bleeding, edema, and ecchymosis.

Although internal fractures had a lower incidence of ecchymosis on postoperative days 7 and 15, when compared among themselves, these techniques did not present a statistically significant difference. Currently, clear recommendations cannot be indicated; thus, other studies are required to confirm the efficacy of one technique over the other.

**COLLABORATIONS**

| FPM | Analysis and/or interpretation of data; statistical analyses; conception and design of the study; completion of surgeries and/or experiments; writing the manuscript or critical review of its contents. |
| HB | Writing the manuscript or critical review of its contents. |
| JBM | Writing the manuscript or critical review of its contents. |
| BPSFF | Writing the manuscript or critical review of its contents. |
| FGOQ | Writing the manuscript or critical review of its contents. |
| BMBO | Final approval of the manuscript; conception and design of the study. |
| CEJB | Analysis and/or interpretation of data; final approval of the manuscript; conception and design of the study; writing the manuscript or critical review of its contents. |

**REFERENCES**


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