British Journal of Medicine & Medical Research
15(6): 1-5, 2016, Article no.BJMMR.24530
ISSN: 2231-0614, NLM ID: 101570965

SCIENCEDOMAIN *international*
www.sciencedomain.org

Effect of Lateral Osteotomy in Subperiostal Plan in Reducing Severity of Periorbital Edema and Ecchymosis after Rhinoplasty

Atighechi Saeid[1], Meybodian Mojtaba[1], Vaziribozorg Sedighe[1], Behniafard Nasim[1] and Mandegari Mohammad[1*]

[1]Otorhinolaryngology Research Center, Department of Otolaryngology Head and Neck Surgery, Shahid Sadoughi University of Medical Sciences, Yazd, Iran.

Authors' contributions

This work was carried out in collaboration between all authors. Author AS designed the study, wrote the protocol, and wrote the first draft of the manuscript. Authors VS and BN managed the literature searches, analyses of the study performed the spectroscopy analysis. Authors Mandegari Mohammad and Meybodian Mojtaba managed the experimental process. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/BJMMR/2016/24530
Editor(s):
(1) Medhat Emil Habib, Department of Plastic and Reconstructive Surgery, Zayed Military Hospital, Abu Dhabi, UAE.
Reviewers:
(1) Gianmarco Saponaro, Universit`a Cattolica del Sacro Cuore, Italy.
(2) Roberta Di Mauro, University of Rome Tor Vergata, Rome, Italy.
(3) Anonymous, Alexandria University, Egypt.
(4) R. V. Nataraj, Grant Govt. Medical College and Sir JJ Group of Hospitals, Mumbai, India.
Complete Peer review History: http://sciencedomain.org/review-history/14396

Original Research Article

Received 24th January 2016
Accepted 11th April 2016
Published 1st May 2016

ABSTRACT

Introduction: Osteotomy is the main reason of periorbital edema and ecchymosis after rhinoplasty due to damage of angular vessels and fracture of the nasal bones and frontal process of maxilla. Several methods are suggested for reducing periorbital edema and ecchymosis. The main purpose of this study was to determine the effect of internal lateral osteotomy in subperiosteal plan in reducing periorbital edema and ecchymosis after rhinoplasty.
Methods: This double-blinded clinical trial was conducted on 30 patients. Internal lateral osteotomy was performed in one side in subperiosteal plan and opposite side used as a control without elevation of periostium from the bone. The degree of edema/ecchymosis on both sides was compared on the 1st and 7th day postoperatively.

**Corresponding author: E-mail: m.mandegari2015@gmail.com;*

Results: The severity of periorbital edema was more significant in one side with periosteal elevation 24 hours after operation (P. value=0.006). However, no significant difference was found in periorbital edema between both sides 7 days after the surgery (P. value=0.098). The severity of periorbital ecchymosis was also more significant in the side with periosteal elevation 24 hours (P. value= 0.023) and seven days after operation (P. value=0.004).
Conclusion: Since lateral osteotomy in subperiosteal plan increased periorbital edema and ecchymosis after rhinoplasty, performing lateral osteotomies without subperiosteal tunneling during rhinoplasty operation is suggested.

Keywords: Ecchymosis; edema; osteotomy; rhinoplasty.

1. INTRODUCTION

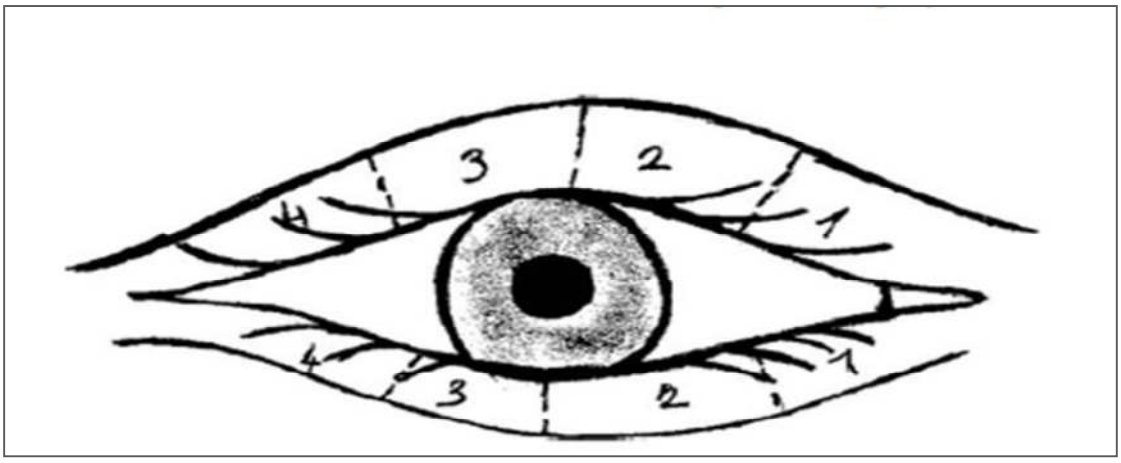
Cosmetic surgeries are the most common surgical procedures in modern world and the trend to perform the cosmetic surgery and on the top of them, rhinoplasty is increasing day to day [1]. Rhinoplasty is an obtrusive procedure and brings about some side effects and complications that are not desirable for both patient and surgeon [2]. Two of the most common side effects of rhinoplasty are periorbital edema and ecchymosis which are stressful for patients after rhinoplasty. Hemorrhage during rhinoplasty has three different origins: damage to big vessels (angular vessels) at the site of osteotomy, periosteal small vessels tearing during osteotomy, and damage to small sub dermal vessels during inserting the osteotome and performing osteotomy [3,4]. Osteotomy is the main reason of periorbital edema and ecchymosis after rhinoplasty because of damaging angular vessels fracture of nasal and frontal process of maxillary bones.

Several methods are suggested to reduce periorbital edema and ecchymosis such as using local vasoconstrictor and anesthetics in osteotomy area, using micro osteotomy, medial osteotomy instead of latral osteotomy, using steroids before and after the surgery, and saving periosteal adhesion during osteotomy [5-7].

In internal lateral osteotomy method, we can elevate periostium of maxilla and nasal bone and then after creation of a subperiosteal tunnel, cut the bone to perform osteotomy. However, lateral osteotomy could be performed without periostal elevation. Through periosteal elevation and creation of a subperiosteal tunnel, it is possible to decrease local bleeding and damage to vessels [8-10]. However, periosteal elevation potentially leads to extensive damage to perinasal soft tissue [11,12]. In this study, we attempted to evaluate the effect of internal lateral osteotomy in subperiosteal plan compared with no periostal elevation on periorbital edema and ecchymosis after rhinoplasty.

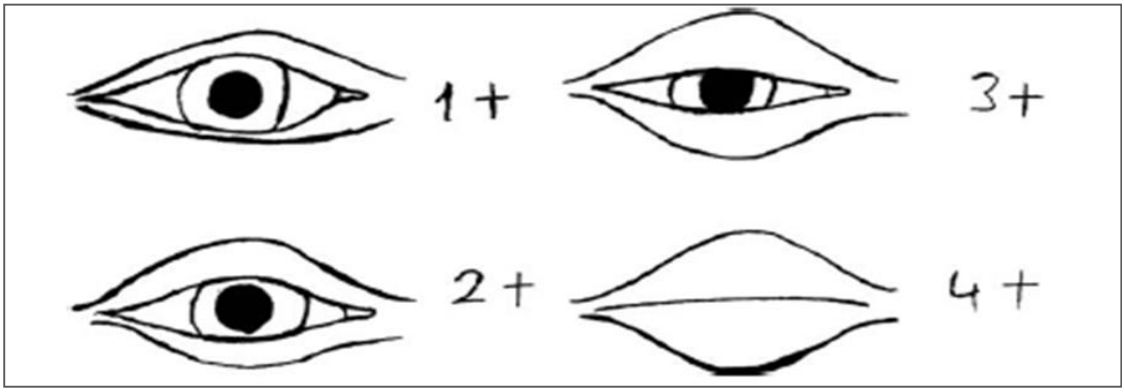
2. METHODS

This double blind clinical trial study was approved by Ethics Committee of Shahid Sadoughi university of medical sciences .Informed consent was obtained from all individual participants included in the study**.** The study samples were 30 individuals who underwent rhinoplasty. Lateral osteotomies were carried out on a randomly chosen side in subperiosteal plan and without creating a subperiosteal tunnel on the other side. We used guided, curved 4-mm lateral osteotomies (massing osteotome) for the lateral osteotomies. The degree of edema/ecchymosis on both sides was compared on the 1^{st} and 7^{th} day postoperatively by another surgeon, who was unaware of the side with the periosteal tunnel. Patients with history of hypertension and coagulopathies, those who was taking anticoagulant drugs, and females during menstrual cycle were excluded from the study. General anesthesia was induced for all patients and we used 3 cc of the 1:100000 epinephrin solotion in both sides. We didn't use internal splint for septum in any patients. We used nasal packing on the first day after the surgery. We used external splint for all patients for the seventh days after the surgery. Acetaminophen was used as an analgesic after the surgery. Heads of all patients were elevated, cold packs placed on both eyes for 12 hours and antibiotics prescribed for 5 days. We evaluated the eyelid edema and periorbital ecchymosis separately using a scale of 0–4 (Scheme 1 and Scheme 2). The interrelations among the data were examined by $\chi 2$ test. P values less than .05 were considered to be statistically significant.



Scheme 1. Scale for periorbital ecchymosis: 0: None_ +1: To the medial conthus_+2: To the pupil_+3: Past the pupil

Scale for periorbital ecchymosis.0, none; (+)1, to the medical canthus; (+)2, to the pupil; (+)3, past the pupil; (+) 4, to the lateral canthus.



Scheme 2. Scale for periorbital edema: 0: None_ +1: Minimal_+2: Covering to iris_+3: Massive edema

Scale for periorbital edema. 0, none;(+)1, minimal;(+)2, covering to iris;(+) 3, reaching to pupil; (+)4, massive edema

3. RESULTS

This double blind clinical trial was conducted on 30 patients (21 females and 9 males) with mean age of 20.4±2.7 who underwent rhinoplasty. Periorbital edema degree was more severe and significant in one side with periosteal elevation 24 hours after the surgery compared to the other control side (P. value=0.006). However, no significant differences was found in periorbital edema between both sides 7 days after the surgery (P. value=0.098) (Table 1).

Periorbital ecchymosis degree was more significant and severe in one side with periosteal elevation on the first and 7th day after the surgery (P. value= 0.023 and P. value=0.004) (Table 2).

Table 1. Periorbital edema 24 hours and 7 days after the surgery

Surgical field	Periorbital edema in first day after the surgery	Periorbital edema in 7th day after the surgery
with periostal elevation	2.26	1.23
without periostal elevation	1.5	0.90
p.value	0.006	0.098

Table 2. Periorbital ecchymosis 24 hours and 7 days after the surgery

Surgical field	Periorbital echymosis in first day after the surgery	Periorbital echymosis in 7th day after the surgery
With periostal elevation	2.9	1.7
Without periostal elevation	2.26	1.33
p.value	0.004	0.023

Fig. 1a. Periorbital edema and ecchymosis after 24 hours. The right side with periosteal elevation and the left side without periosteal elevation

Fig. 1b. Periorbital edema and ecchymosis after one week. The same patient

4. DISCUSSION

Two of the most common side effects of rhinoplasty are periorbital edema and ecchymosis which are inevitable in patients after rhinoplasty. Several researchers believe that subperiosteal tunneling before lateral osteotomy can decrease severity of periorbital edema and ecchymosis created by minimal damage of vessels [8,9]. On the other hand, some others do not suggest subperiosteal tunneling because of extensive damage to perinasal soft tissue. They believe that creating a space for collecting blood can increase periorbital edema and ecchymosis [11,12]. In the current study, the degree of periorbital edema and periorbital ecchymosis were more significant and severe in one side with periosteal elevation compared to the other control side 24 hours after the surgery. In a study by Ghazipour et al. [11], on 50 patients with lateral osteotomy, periorbital ecchymosis was reported more severe in side with periosteal elevation in 39 patients [12]. Tebbet et al. [13] suggested that elevating flap in Sub SMAS plan in level of the nasal cartilages can decrease bleeding and local edema. Also in Kara CO et al. [14] study on 18 patients, periorbital edema and ecchymosis in the side without periosteal elevation were lower but not significant compared to the other control side. According to Mc Carthy and Wood-Smith, high osteotomies lead to periorbital ecchymosis increasing [15]. In another study by Al-Arfaj et al. [16] osteotomy without periosteal elevation for decreasing periorbital edema and ecchymosis was recommended.

Fig. 2a. Periorbital edema and ecchymosis after 24 hours. The right side with periosteal elevation and the left side without periosteal elevation

Fig. 2b. Periorbital edema and ecchymosis after one week. The same patient

5. CONCLUSION

Since lateral osteotomy in subperiosteal plan increased periorbital edema and ecchymosis after rhinoplasty, performing lateral osteotomies without subperiosteal tunneling during rhinoplasty operation is suggested.

CONSENT AND ETHICAL APPROVAL

This double-blind clinical trial study was approved by Ethics Committee of Shahid Sadoughi University of medical sciences and Informed consent was obtained from all individual participants included in the study.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Ghazipour A, Akbari Dilamghani N. Effect of dexamethason on postoprative priorbital edema and ecchymosis in rhinoplasty. Iranian Journal of Otorhinolaryngology. 2007;19:7-10.
2. Rettinger G, Steininger H. Lipogranulomas as complications of septorhinoplasty. Archives of Otolaryngology–Head and Neck Surgery. 1997;123:809-814.
3. Hatef DA, Ellsworth WA, Allen JN, Bullocks JM, Hollier LH, Stal S. Perioperative steroids for minimizing edema and ecchymosis after rhinoplasty: A meta-analysis. Aesthetic Surgery Journal. 2011;31:648-657.
4. Gun R, Yorgancılar E, Yıldırım M, Bakır S, Topcu I, Akkus Z. Effects of lidocaine and adrenaline combination on postoperative edema and ecchymosis in rhinoplasty. International Journal of Oral and Maxillofacial Surgery. 2011;40:722-729.
5. Kara CO, Gökalan I. Effects of single-dose steroid usage on edema, ecchymosis, and intraoperative bleeding in rhinoplasty. Plastic and Reconstructive Surgery. 1999;104:2213-2218.
6. Scott Griffies W, Kennedy K, Gasser C, Fankhauser C, Taylor R. Steroids in rhinoplasty. The Laryngoscope. 1989;99: 1161-1164.
7. Hoffmann DF, Cook TA, Quatela VC, Wang TD, Brownrigg PJ, Brummett RE. Steroids and rhinoplasty: A double-blind study. Archives of Otolaryngology–Head & Neck Surgery. 1991;117:990-993.
8. Huizing EH, Huizing EH, de Groot JAM. Functional Reconstructive Nasal Surgery. Thieme; 2003.
9. Gates GA. Current Therapy in Otolaryngology: Head and Neck Surgery. Mosby; 1998.
10. Sheen JH, Sheen AP. Aesthetic Rhinoplasty. Quality Meical Pub; 1998.
11. Ghazipoor A, Akbari Dilmaghani N. Effects of subperiosteal tunnel creation on periorbital edema and ecchymosis after Rhinoplasty. Iranian Journal of Otorhinolaryngology. 2007;19:79-82.
12. Berman WE. Rhinoplastic surgery. Mosby; 1989.
13. Tebbetts JB. Primary rhinoplasty: Redefining the logic and techniques. Elsevier Mosby; 2008.
14. Kara CO, Kara ING, Topuz B. Does creating a subperiosteal tunnel influence the periorbital edema and ecchymosis in rhinoplasty? Journal of Oral and Maxillofacial Surgery. 2005;63:1088-1090.
15. McCarthy J, Wood-Smith D. Rhinoplasty. Plastic Surgery. 1990;3:1795-1796.
16. Al-Arfaj A, Al-Qattan M, Al-Harethy S, Al-Zahrani K. Effect of periosteum elevation on periorbital ecchymosis in rhinoplasty. Journal of Plastic, Reconstructive and Aesthetic Surgery. 2009;62:e538-e539.

Peer-review history:
The peer review history for this paper can be accessed here:
http://sciencedomain.org/review-history/14396