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BRIEF CLINICAL STUDIES

Delayed Bleeding of Sphenopalatine Artery as a Complication in Le Fort I Osteotomy

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Abstract: Rates of severe complications in orthognathic surgery are low, but when they occur they can be fatal. This article reports a case of laceration of the junction of the posterior lateral nasal artery and the sphenopalatine artery, resulting in severe delayed bleeding. Patient undergoes a multiple segment Le Fort I osteotomy with no intraoperative or immediate postoperative complications. On the fourth postoperative day, he presents with epistaxis and intractable postnasal discharge, is admitted to emergency with signs of shock, and bleeding is detected endoscopically originating from the right sphenopalatine artery, which is treated with diathermocoagulation. The advantage of endoscopy in difficult areas is that bleeding complications can be solved with low morbidity.

Key Words: Epistaxis, Le Fort I osteotomy, nasal bleeding, orthognathic surgery

Orthognathic surgery is a routine and common procedure in maxillofacial surgery; the complications are limited, but when they occur, they are usually significant. Large-scale studies have identified percentages less than 3% in complications, where those of hemorrhagic complications are even smaller.^{1,2}

Complications in orthognathic surgery can be short or long-term, with sensorineural alterations, respiratory difficulty, neck pain, anterior open bite, undesired fractures, and others being described.^{3,4} Severe complications that can jeopardize the patient's life are associated with damage of vascular elements such as the maxillary artery or its terminal branches (like the sphenopalatine

artery), palatine arteries, and pterygoid venous plexus,⁵ and these are related to such conditions as facial trauma sequelae, maxillary tumors, nasal septum deformities, and chemical trauma more frequently than to orthognathic surgery.

The present case reports a mediate postoperative complication associated with a disruption of vascular elements of the middle third of the face after executing and mobilizing a Le Fort I osteotomy.

CASE REPORT

Male patient, 28 years, athletic, ASA I, with no other concomitant pathology and without previous surgeries, was admitted in good condition to the Maxillofacial Surgery service diagnosed with class III maxillo-mandibular facial anomaly; upon clinical examination, the patient presents a sagittal deficit of the middle third.

Le Fort I advancement orthognathic surgery was scheduled, segmented in conjunction with a genioplasty for advancement and vertical reduction. Preoperative exams presented no abnormalities, hematocrit 42% and platelets 220,000, PT 100% and TTpk in 29 seconds. The patient underwent the surgical procedure without complications, bleeding close to 300 ml during surgery. Patient enters usual postoperative protocol in recovery room, breathing spontaneously, evolving favorably with moderate edema, without pain, being discharged from the hospital on the second postoperative day.

On the fourth postoperative day, the patient consults for intense post-Valsalva epistaxis (cough) of approximately 2 hours of evolution that did not yield to local compression. Examination of the patient reveals profuse nasal bleeding and with nasal and pharyngeal discharge; nasal packing is done with Merocel (Medtronic, USA), volume repositioning, and tranexamic acid (Especil, Grünenthal, Germany), effecting a significant reduction of the bleeding; the control hematocrit was 37%.

The patient returns home and although he spends the night without complications, again presents at the hospital relating profuse bleeding, adynamia, and tachycardia. Ten hours after the first evaluation, the patient is observed as pale, sweaty, tachycardic with intractable nasal bleeding.

On the fifth postoperative day and observed as having maxillary bleeding and postnasal discharge, it is decided to perform a revision surgery, where oral intubation is done with great difficulty due to the scarce visibility; the nasal packing is removed and the nostrils are visualized endoscopically, where intense arterial bleeding can be seen under the middle turbinate of the right nostril (Fig. 1A).

With endoscopic help, the middle turbinate is removed, identifying a rupture in the junction of the posterior lateral nasal artery branch and the sphenopalatine artery, which is controlled with diathermocoagulation (Suction-Coagulator, Valleylab, Medtronic, USA), causing immediate cessation of the bleeding (Fig. 1B); then Surgicel is installed (Ethicon, USA) and packing with Merocel (Medtronic, USA) in the right nostril.

The patient finishes the surgery with hematocrit of 26% and in good general condition, being discharged on the second postoperative day. Four days later, the nasal packing is removed, confirming the absence of bleeding or any other type of complications.

DISCUSSION

Bleeding complications in orthognathic surgery have been widely described. Massive blood losses during these procedures are not common, but they can put the patient's life in jeopardy.⁶ Piñeiro et al, in their study on blood losses in orthognathic surgery, found losses of 436 ml on average, and that generally regardless of the procedure (uni- or bimaxillary), blood losses rarely reach transfusion levels.⁷

Politis⁸ assessed complications after 750 Le Fort I osteotomies, finding 2 major complications that could be life-threatening, also

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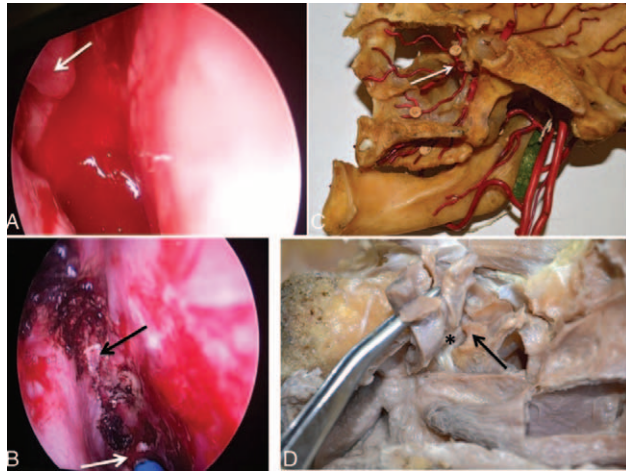


FIGURE 1. (A)- Bleeding in posterior zone below middle turbinate (arrow indicates middle turbinate). (B) Operative zone after removal of middle turbinate (black arrow) and diathermocoagulation of sphenopalatine artery (white arrow). (C) Distribution of the irrigation of the sidewall of the nasal fossa (white arrow indicates junction of sphenopalatine artery and posterior lateral nasal branch). (D) Ethmoidal crest (black arrow), sphenopalatine neurovascular bundle (asterisk).

AQ7

indicating that the onset of postoperative bleeding usually begins on the 7th postoperative day.^{8,9} The vessels involved in maxillary surgery are mainly the palatine artery and the sphenopalatine artery; bleeding from larger vessels such as the carotid artery is rare.^{10,11,12}

In this case, the laceration is believed to have occurred during nasotracheal intubation,^{13,14,15} likely complicated by the facial deformity, but which was activated by the postoperative valsalva (cough) at home.

After performing local maneuvers, invasive measures are indicated where vessel ligation has traditionally been the method used to control intractable bleeding or bleeding of large vessels.¹⁶ The sphenopalatine artery is one of the terminal branches of the maxillary artery and after the pterygopalatine fossa, it enters the nasal fossa through its foramen in the ascending portion of the palatine bone. Immediately after entering the nasal fossae through the sphenopalatine foramen, the artery is divided into an anterior and a posterior branch (Fig. 1C). The anterior branch irrigates the lower posterior portion of the nasal sidewall and it also has a branch towards the posterior part of the middle turbinate. When a partial middle turbinate resection is performed that extends to the posterior part, there is a risk of bleeding from this branch of the sphenopalatine artery.¹⁷

The posterior portion of the middle turbinate is attached to the ascending portion of the palatine bone and forms a small, elevated crest in the anteroinferior part of the sphenopalatine foramen (ethmoidal process of the palatine bone or ethmoidal crest of the palatine bone), and its endoscopic recognition facilitates the location of sphenopalatine foramen. The crest projects approximately 2 to 3 mm medially from the palatine bone and 4 to 5 mm upwards. Its connection to the middle turbinate is generally fibrous, which is why it is easily removed during the procedure.^{18,19}

Once recognized, a dissection posterior to the ethmoidal crest is performed, where the sphenopalatine neurovascular bundle appears that emerges from the pterygopalatine fossa through the sphenopalatine foramen together with the posterior nasal nerve above the second branch of the trigeminal nerve (Fig. 1D).

The classic approach is 1 cm before the posterior edge of the middle turbinate; however, we perform the middle turbinectomy to reach the emergency zone of the artery with a wide field given the abundant bleeding and the lacerated zone being defined next to it. Since the instrument allows straightforward handling in a reduced field, use of the suction coagulator system associated with endoscopic visualization makes an efficient and cost-effective approach that is superior to packing and large vessel ligation.²⁰

Finally, we can conclude that the endoscopic management in such complications had low morbidity and high effectiveness, solving potentially fatal complications.

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AQ6

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