

Comparative between Buccal and Vestibular Approaches for Bichectomies

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Abstract

Introduction: Bichectomy is the name given to the surgical procedure that has the objective of removes the adipose body fat of the cheek, eliminating the portion corresponding to the "Bichat" fat pad, which includes around 30 to 40% of this structure. This procedure delivers as a result the reduction of the volume in the middle third of the face. And we use this technique as a good option to analyze and compare.

Objectives: To analyze and compare which is the best and easiest approach for buccal fat removal between Buccal and Vestibular.

Material and methods: A prospective study was carried out in the Service of Plastic Surgery of the General Hospital of Mexico, during a period of 1 year of evaluation. In an universe of 57 patients, comparing the easiest surgical approach during the plastic surgery formation, all the surgeons where residents between second to fourth year, the evaluation time, oedema, bleeding, post-surgical pain, and the comparison among buccal an vestibular approach.

Results: 57 patients were analyzed, independent variables where buccal and vestibular approaches. The most common complication was oedema in 56%, bleeding in 3.5%, with Vestibular approach in 64.9%, and buccal 35.98%, the minor time were 10 minutes, and the mayor time were 35 minutes, so the best approach was vestibular by less soreness, pain, and bleeding, during the plastic surgery residency.

Discussion: The bichectomy has an important historical antecedent since in the beginning it was a surgery even without importance in the medical field. The removal of Bichat fat currently has more aesthetic than reconstructive purposes.

Conclusions: The best approach to have less complications during the plastic surgery formation is the vestibular, even it was a second or a fourth year plastic surgery resident, and one of the concepts if when you use the same approach your skill fullness improve.

Keywords: Bichectomy; Buccal; Vestibular; Bleeding

Introduction

The Buccal Fat Pad (BFP) was described by the German anatomist Lorenz Heister in 1727 in his "Compendium Anatomicum" calling it "Glandular Moralis" (molar gland) for the first time [1]. He believed that it had no specific function, so from then on time more anatomists have been given the task of studying its function, embryology, and its relationship with the masticatory space [1].

Later in 1801; Marie-François Xavier Bichat French physician, surgeon and anatomist who described the BFP where he showed that it was composed solely of adipose tissue and located between

the buccinator and masseter muscles and the skin [1,2]. He also mentioned that it is an independent structure of the adjacent adipose tissue [2].

In 1977, Peter Egyedi used for the first time the BFP as a pedicle flap with a skin graft for closure of oroantral and oronasal fistulas. Tiedeman in 1986 showed that a BFP flap epithelialized 3 weeks after placement [1-3].

Since then, BFP has not only been withdrawn to improve facial esthetics, but has also been used to reconstruct intraoral defects, but now is the a good options for aesthetic indication and have very good

results, even the surgical approach, vestibular *versus* buccal, it is a good option to analyze, and we decide to made an study to analyze surgical approaches and compare, in our hospital, removing the buccal fat pad [2,4].

Anatomically the BFP is a tubular-shaped collection of adipose tissue that occupies a prominent position in the midface [4]. It has an average weight of 9.3 grams and an average volume of 9.6 cc [5].

It has a main body that lies behind the zygomatic arch and 4 extensions.

These extensions will be named depending on their location: buccal, pterygoid, pterygopalatine, and temporal. The buccal extension is the largest segment with 30%-40% of its weight and the body is the smallest with 25% of its weight, the weight of the remaining extensions is usually variable [5].

Other authors divide the body of the BFP into three lobes: The anterior, posterior, and intermediate lobe. These three lobes are each encapsulated by an independent membrane, fixed by other ligaments and they vascularization by different arteries [2-5].

The vascularization of the BFP is derived from 3 branches of the maxillary artery: the deep temporal, buccal, and superior posterior alveolar arteries, also from branches of the facial artery. The venous drainage is provided by the facial vein [1,4,5].

The innervation of the BFP is provided by the facial nerve, in its buccal and zygomatic branches [5].

Methodology

A universe of 57 patients operated by aesthetic indication, we analyzed which surgical approach of the bichectomy were the simplest, less complications, less time, during our resident program of plastic surgery, the surgeons where residents from the second to the fourth year.

The Objective of the study was to demonstrate using a prospective study during from March 2021 to March 2022, patients of the Service of the General Hospital of Mexico, the surgery was done by Residents.

All the variables were measures by the surgeon who did the operation, and even the surgeon who prefer one approach over the other, they must change their usual approach for the study.

The surgery was made in the ambulatory surgery, all patients went with no complications.

Analysis and Results

We analyzed 57 patients, female, and male, between 18 and 50 years old, that had bichectomy operation in the Plastic Surgery Service of the General Hospital of Mexico, over a year of evaluation.

We analyze the patients, that want to have a face more perflated, and with hypertrophy of the buccal fat pad, the surgery was done by local anesthesia, and by residents of the second, third and fourth year of the plastic surgery residency.

To analyze all the patients we ask during the surgery, what technique do they preferred after 2 o 3 surgeries done by them preferred technique, we change the approach, and even the change of this technique approach them did, we did not increase the complications, in the patients where the surgeon changed the approach, the time increased up to 35 minutes as the longest time doing a bichectomy, *versus* an average of 10 minutes.

We followed the patients until oedema were gone, 14 days after surgery, and the complications evaluated were oedema, bleeding, and post-operative pain (measured by Agnostic Visual Evaluation) (Images 1-5).

Results

The analysis of this study, begun as a hypothesis in the explication of which of the approach of the bichectomy could be the best one for the residents during the formation program. The 57 patients we analyzed were under 15 to 50 years old, female and male, no criteria exclusion under those years, all patients did not have comorbidities, just two patients with diabetes mellitus type II, under full control.



Image 1: Vestibular Bichat Approach technique in a description, preferred in men.

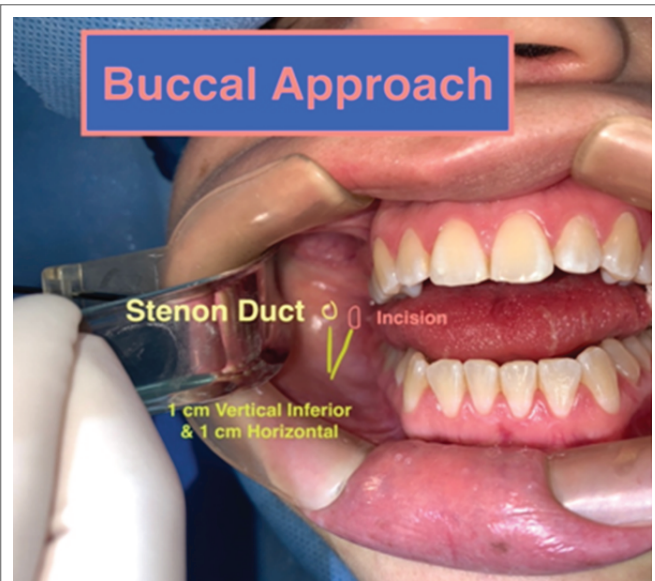


Image 2: Buccal Bichat Approach technique in a description, preferred in women.



Image 3: Vestibular Fat Pad View in a Vestibular Approach.

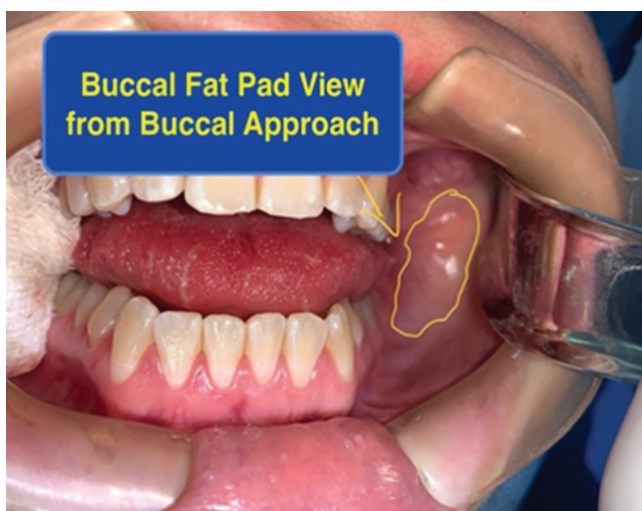


Image 4: Buccal Fat Pad View from a Buccal Approach.



Image 5: Vestibular Approach of the Buccal Fat Pad no bleeding.

In the age range, the average of it were 27 years old, patients were from 15 years the youngest and 48 years the oldest. With 50 females and 7 males patients.

The approach of the buccal fat pad were 20 patients doing the buccal approach the 35.08%, and 37 patients doing the vestibular approach the 64.9%.

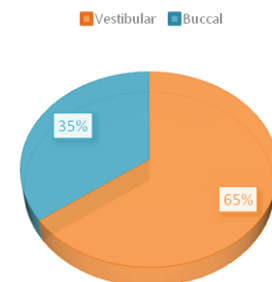
In the Time follow up, the less and the main average of time were 10 minutes, and the largest time were 35 minutes, could be the most frequent case of soreness.

In the complications of bleeding, in 2 patients were reoperated and reexplore the wound because of the bleeding, using the cautery as the control in the bleeding, they were the 3.5%, and the other 55 patients does not have the complication being the 96%.

The other complication is the Oedema, and soreness that its present in the 32 patients, the 56% of the total patients, and 25 patients does not have oedema the 43% (Graphics 1-3).

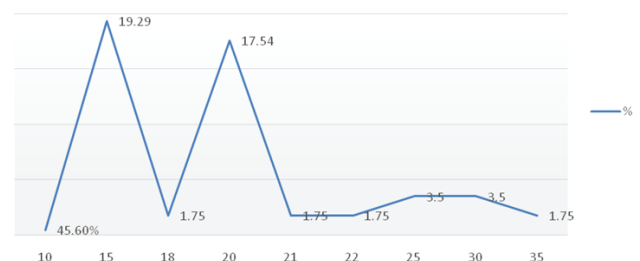
We measure the post-operative pain after the surgery (2 hrs and during the fourteen days after the surgery), after the surgery the main average were 5, and everyone had the treatment with 1 gram of Paracetamol every 8 hours for 3 days, and perfectly evolution (Images 6 and 7).

THE DIFFERENCE BETWEEN THE VESTIBULAR AND BUCCAL APPROACH.

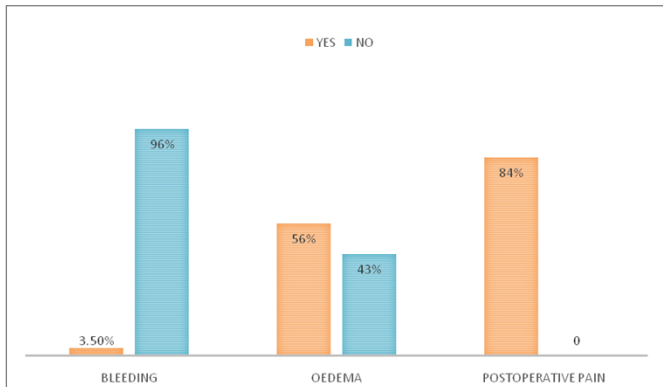


Graph 1: In this graphic, the main prevalence of the vestibular approach 65% in 35 patients between 35% of 20 patients, being more accepted the vestibular approach even some surgeons prefer buccal.

TIMING EVALUATION DURING THE SURGERY.



Graph 2: In this graphic we evaluate the time of the surgeon doing the bichectomy, since the average of 10 minutes equal to 45.60%, until the surgery more delayed by 35 minutes in 1.75%.



Graph 3: The complications where bleeding in 3.5%, Oedema in 56% of all the patients, and the post-operative pain in 84% in an average of the EVA classification of level 5.



Image 6: Buccal Approach in a woman with 1 month of follow up; no complications, and good aesthetics profile.



Image 7: Vestibular Approach in a man with 1 month of follow up; He has an hematoma-drainage complications, and still had good aesthetics profile.

Discussion

Bichectomy is the name given to the surgical procedure that has as its objective the resection of the adipose body of the cheek, eliminating the portion corresponding to the “Bichat” fat pad, which includes around 30 to 40% of this structure. This procedure delivers as a result the reduction of the volume in the middle third of the face [1-5].

Heister, et al. introduced the BFP for the first time in 1732. They believed that the newly introduced structure was glandular and named it “molarisglandula”. Bichat in 1802 described this anatomic mass and realized it is true nature. Therefore, it is commonly referred to as the boule de Bichat or bollegraisseuse in French; it is called “wangenfettpfropf” or “Wangenfettpolster” (Wangen means cheek, fett means fat, and pollster means pad) in German, and the sucking pad, sucking cushion, masticatory fat pad, or BFP in English [5-7].

BFPs, commonly described as Bichat’s fat pads, were first described and characterized by a French anatomist named Marie François Xavier Bichat in the late 18th century [8].

He described an encapsulated mass of fat in the face on the outside of the buccinator muscle reporting its histological etiology of a central body and 4 extensions: buccal, pterygoid, pterygomaxillary and temporal. The body is centrally positioned and located above the parotid duct behind the zygomatic arch and is divided into 3 lobes: anterior, intermediate, and posterior, in accordance with the structure of bones, ligaments and blood vessels [9].

One of the main functions of the BFP as an adult is the syssarcosis action this means gliding function between the muscles of mastication during function; also play an important role in infants helping during the sucking action of feeding through resist negative pressure on the cheeks and avoiding its collapse during breastfeeding. The other function is responsible for cheek fullness and contour and may work as a protective covering the neurovascular bundles [9].

BFP plays an important role in the internal volume of the oral cavity, which can lead to frequent traumas causing discomfort and injury, with the possibility of evolving to pathologies, such as lipoma, herniation, oral submucous fibrosis, and pseudoherniation. The indication for the removal of Bichat’s fat pad may change depending on each patient. Bichat’s fat pad is removed when there is constant trauma to the cheeks caused by teeth during the masticatory function, generating traumatic ulcers [9,10]. The oral fat pad can be removed or used in the surgical treatment of all pathologies previously mentioned showing good functional and aesthetic results [10].

Anatomy

The BFP is described as a main body and 3 lobes: anterior, intermediate, and posterior. The posterior lobe has 4 extensions named according to their location: buccal, pterygoid, pterygopalatine, and temporal. Each lobe of the buccal fat pad is encapsulated by an independent membrane, fixed by some ligament, and nourished by different arteries. An independent vascular plexus exists under the lobar capsule, and there is a natural space among the lobes [11].

The body and the buccal extensions are superficial to the buccinator and deep to the parotid masseteric fascia. Just lateral to the body extension, the facial nerve (buccal and zygomatic branches) and the parotid duct are located. The parotid duct pierces the buccinator muscle at the anterior border of the body of the BFP. The BFP is located deeper than the premasseteric fat compartments and is suspended to the surrounding structures by a series of ligaments. The BFP could be categorized as a deposit adipose tissue type, because it is composed

of non-lobular adipose tissue containing large adipocytes that are not entirely covered with a collagen network [8-11].

The vascularization of the BFP is rich with an abundant capillary network derived from 3 branches of the maxillary artery: the deep temporal, buccal, and superior posterior alveolar arteries. Additional blood supply is derived from branches of the facial artery and from the transverse facial artery, which is a branch of the superficial temporal artery. The venous drainage is provided by the facial vein. The BFP flap is therefore categorized as an axial flap [8-11].

The BFP is supplied by vessels from different sources that enter the fat tissues along the surface of the ligaments and that form the lobar subcapsular vascular plexus by anastomosing to each other. The posterior superior alveolar artery begins at the third segment of the internal maxillary artery and divides one superior branch of the intermediate lobe. This branch goes behind the posterior zygomatic ligament and enters the lobe. Its distal end connects the inferior branch of the intermediate lobe from the buccinator artery. The posterior superior alveolar artery runs down behind the end of the posterior zygomatic ligament. When rounding the inner termination of the maxillary ligament, it sends out several branches-the superior branches of the anterior lobe, which run along this ligament to this lobe [8-11].

The BFP is innervated by the buccal and zygomatic branches of the facial nerve, which is why care must be taken in surgical manipulation to avoid paresis or even paralysis [6-11].

The bichectomy has an important historical antecedent since in the beginning it was a surgery even without importance in the medical field, as the years went by and the problems that said structure came to provide, it was demonstrated that it has an important functionality to carry out this surgical procedure with Regarding the functionality that this procedure entails, at present its use as an aesthetic procedure has a great impact in the medical area, especially in plastic surgery, for which recently in the last few years different surgical techniques have been developed, among them the already mentioned, buccal approach and vestibular approach, each with its own characteristics, advantages, disadvantages and complications [10,11].

The removal of Bichat fat currently has more aesthetic than reconstructive purposes, the use of autologous fat transfer on the face for reconstructive purposes is increasingly in use, mainly in craniofacial congenital anomalies, sequelae secondary to other pathologies, such as For example, traumatic accidents, after surgical procedures, etc. With this, we have that one of the largest possible autologous fat transfers is Bichat fat [9-11].

The two most important surgical techniques described in the literature are the buccal and vestibular approaches. Next, we will mention the different advantages and disadvantages of performing a bichectomy with a buccal and vestibular approach [11].

Buccal approach

The advantages are as follows: it is an easy procedure to perform, low rate of complications and low morbidity, it is well accepted by patients, it is adequately managed even in patients with cachexia or thin, a highly vascularized area which prevents infections in susceptible patients, it is an easy procedure to perform with local anesthesia, it does not leave a visible scar. The disadvantages are it is not suitable for large defects, it can only be performed one time, it may not be an option in previously irradiated patients, or patients with Down syndrome or malar hypoplasia, It will not add volume to the reconstructed defect [1,6,11].

To execute the buccal technique, you must start by infiltrating local anesthesia into the posterior maxillary vestibule on the ipsilateral side as where the anomaly is [1,11].

Next, approximately 1 cm above the mucogingival junction, at the level of the second molar, initiate a short 2 cm, horizontal incision using a monopolar electrocautery, which should be directed to the posterior area [1,11].

The first layer to be found is the mucosa, followed by the buccinator muscle, which is why the use of a Minnesota retractor will be helpful during the dissection, maintaining an adequate tension as well as lateral retraction of the cheek [1,11].

You will encounter the maxillary periosteum after the aforementioned layers where, in its superior-lateral surface, lies the BFP [1,6,12].

To incise the maxillary periosteum a monopolar cautery es needed, using the entire length from the mucosal incision, through which the BFP usually protrudes [1,7,9].

At this point Dean scissors, angled away from the body of the flap, are used to bluntly dissect the tissues that surround the BFP, which will separate both [1,7,9].

It is very important to avoid pulling forcefully on the flap whilst using the DeBakey forceps; one, because it is unnecessary, and two, because it would disturb its fullness, decrease blood supply, or increase hemorrhage. If, after adequate technique on dissection, the BFP does not bulge out easily from the incision, then either enlarging the incision or performing judicious sharp dissection with the Dean scissors should be considered. Also, the assistant could apply pressure from the cheek skin, above the zygomatic arch, downwards [1,8,11].

Whenever enough flap is available to cover the defect without tension, it must be gently immobilized using the DeBakey forceps and secured in place with interrupted sutures. Since there is poor collagen network in the BFP, big suture bites as well as multiple mattress sutures may be useful to minimize their probability to pull through the adipose tissue [1,4,10].

It is not necessary to cover the flap pad with mucosa for healing. The epithelialization processes starts whenever the fat is replaced by granulation tissue, which will be further replaced by Para keratinized stratifies squamous epithelium by the fourth week after the surgery [1,6,11] (Images 2 and 4).

Vestibular approach

Advantages are: can be used for autologous transfer as it is a wide source of robust and high-quality autologous fat, suitable for transfer. The dissection and collection of Bichat fat is very simple and reliable. The incision, bleeds very little, is simply irrigated with saline/betadine solution and left open, it heals asymptotically and fairly quickly [1,7,9,12].

The disadvantages have not yet been reported due to the little application of this technique [1,7,11].

In this surgical technique with a vestibular approach, it begins by injecting 5 cc of lidocaine and epinephrine into the gingivobuccal space, approximately between the first and second upper molars. After local anesthesia, an incision of 0.5 to 1 cm is initiated, preserving a mucosal cuff for easier closure later. The incision is made cranial to Stensenduct, always preserving the integrity of this duct [1,7,12].

After the incision in the mucosa, with hemostatic forceps, blunt dissection is performed through the buccinator muscle. The last step is

carried out with the support of external pressure on the cheek, at the level of the buccal fat pad, with which the Bichat fat is easily extracted [1,7-9] (Images 1 and 3).

Conclusions

The best approach is the one that gave us lesser complications during the plastic surgery residency; like in this study: vestibular approach. The surgeons were in the second or in the fourth year of his residency, and one of the main objectives were when you use the same approach your skillfulness improve (the buccal).

During the vestibular approach, all residents went more comfortable, safer, and made them faster than buccal, because having the Stensen duct nearly made them insecure and increase the average time of 10 minutes.

In the vestibular approach the edema and soreness where present if the surgery went more than 10 minutes, we could conclude that independent the approach if the bichectomy went more than 10 minutes, soreness, oedema, and bleeding could be present in 56% of the cases.

Bichat surgery has a scientific foundation in various issues, both aesthetic and functional, in this article we describe and compare two different surgical techniques that help us better understand the operation before, during and after surgery. Surgical procedure with which we reach the conclusion that with respect to these two surgical techniques, buccal and vestibular approach the best surgical technique is buccal approach and may be considered as the best treatment option.

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