



Major clinical approaches at the aesthetic level and complications of bichectomy: a systematic review

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Abstract

Introduction: According to the Brazilian Society of Plastic Surgery in 2016, 7,362 people underwent bichectomy (BC), which represents 0.5% of the total number of aesthetic surgeries. In an attempt to achieve facial harmonization, BC surgery presents little complexity and is based on some well-defined steps. Even when appropriately indicated, it is still a controversial procedure, as there is no surgical technique adequately systematized in current literature, aiming to make it safe and reproducible. **Objective:** It was to present the main aesthetic considerations and complications of bichectomy, as well as discuss its safe management to avoid and treat problems. **Methods:** The PRISMA Platform systematic review rules were followed. The search was carried out from November 2023 to February 2024 in the Scopus, PubMed, Science Direct, Scielo, and Google Scholar databases. The quality of the studies was based on the GRADE instrument and the risk of bias was analyzed according to the Cochrane instrument. **Results and Conclusion:** A total of 96 articles were found, 40 articles were evaluated in full and 28 were included and developed in the present systematic review study. Considering the Cochrane tool for risk of bias, the overall assessment resulted in 12 studies with a high risk of bias and 10 studies that did not meet GRADE and AMSTAR-2. Most studies did not show homogeneity in their results, with $X^2=67.9\%>50\%$. It was concluded that on an aesthetic level, performing a bichectomy thins the middle third of the face, outlining and highlighting the bone angulations of the zygomatic region, contributing to a more pleasant

facial aesthetics. Surgical removal of the Bichat ball induces a mild inflammatory process controlled by rescue medication, significantly reduces facial volume, and improves the quality of life and satisfaction with facial aesthetics 3 months postoperatively. Several studies have presented the importance of using the Bichat ball as an oral layer to close fistulas and also to cover bone grafts in implant dentistry.

Keywords: Facial aesthetics. Bichat's fat ball. Bichectomy. Complications.

Introduction

According to the Brazilian Society of Plastic Surgery in 2016, 7,362 people underwent bichectomy, which represents 0.5% of the total number of aesthetic surgeries [1]. To correct facial imbalances, bichectomy (BC) is one of the most sought-after solutions, consisting of a set of surgical techniques that aim at people's physical and psychological well-being, improving facial aesthetics, so that they can work together with other surgical practices, such as rhinoplasty, blepharoplasty and malarplasty to improve BC [2].

The cheek, being bilateral, requires the search for symmetry between them, being limited in its upper part by the infraorbital groove and zygomatic arch and in the lower part by the lower edge of the mandible [3]. The midline is limited by the nasolabial and labiogenian folds, while laterally it is represented by the pre-auricular region [4-6].

In this context, BC is based on the partial removal

of the adipose body (Bichat ball), located in the cheek area [7]. The main eligibility for this practice is for patients who have a pronounced linea alba or trauma to the buccal mucosa, however, this technique has been more sought after for aesthetic purposes. The cheek fat pad, first described by Marie François Bichat in 1802, is a spherical mass of encapsulated fat located between the buccinator and masseter muscles [7].

Thus, their mechanical function serves as a cushion to facilitate sucking and chewing muscular movements [5]. Bichat's fat ball has six extensions spread across the masseteric, superficial temporal, deep temporal, pterygomandibular, sphenopalatine, and inferior orbital areas. And, it resembles other fat deposits in the body, and also without being consumed by the metabolism. Because the Bichat's fat ball gives a rounded facial appearance to some people, it can cause an imbalance in the facial contour [8,9].

In this context, in an attempt to achieve facial harmonization, BC surgery presents little complexity and is based on some well-defined steps. Initially, it is necessary to make a small incision in the soft tissue to gain access to the Bichat's fat ball [10]. A blunt dissection is achieved with fine scissors or hemostats in the fat pocket that is located under the zygomatic arch that extends to the most anterior aspect of the cheek. The fat portions are squeezed and gently pulled until the entire fat pad is removed. A simple seam is performed to close the incision and the surgery is completed [11].

In this sense, Bichat's fat ball of fat has attracted the attention of anatomists and facial surgeons. Its peculiar anatomy and the possibility of using this structure for aesthetic or reconstructive purposes have already been studied by several authors. Satisfactory aesthetic results can be obtained through the manipulation of buccal fat, either through its transposition as a graft or flap for filling or through its resection, the so-called bichectomy [1,12].

Thus, the removal of the Bichat's fat ball has been increasingly sought after in the practice of dental surgeons [13]. The search for reducing the volume of the cheeks leads to a thinning of the face with emphasis on the zygoma. Thus, the removal of buccal fat allows results in volumetric reduction of the lower third of the face and definition of the aesthetically pleasing contours and angulations of this region [14].

Even when appropriately indicated, it is still a controversial procedure, as there is no surgical technique adequately systematized in current literature, aiming to make it safe and reproducible, given the intricate and challenging anatomy of the region. Furthermore, removing the Bichat's fat ball can greatly impair repairs and make the region vulnerable [15,16].

Therefore, the present work aimed to present the

main aesthetic considerations and complications of bichectomy, as well as discuss its safe management to avoid and treat complications.

Methods

Study Design

The present study followed the international systematic review model, following the rules of PRISMA (preferred reporting items for systematic reviews and meta-analysis). Available at: <http://www.prisma-statement.org/?AspxAutoDetectCookieSupport=1>. Accessed on: 02/10/2024. The methodological quality standards of AMSTAR-2 (Assessing the methodological quality of systematic reviews) were also followed. Available at: <https://amstar.ca/>. Accessed on: 02/10/2024.

Data Sources and Research Strategy

The literary search process was carried out from November 2023 to February 2024 and was developed based on Scopus, PubMed, Lilacs, Ebsco, Scielo, and Google Scholar, covering scientific articles from various to the present. The descriptors (MeSH Terms) were used: "*Facial aesthetics. Bichat's fat ball. Bichectomy. Complications*"; and using the Boolean "and" between the MeSH terms and "or" between historical discoveries.

Study Quality and Risk of Bias

Quality was classified as high, moderate, low, or very low in terms of risk of bias, clarity of comparisons, precision, and consistency of analyses. The most evident emphasis was on systematic review articles or meta-analyses of randomized clinical trials, followed by randomized clinical trials. The low quality of evidence was attributed to case reports, editorials, and brief communications, according to the GRADE instrument. The risk of bias was analyzed according to the Cochrane instrument by analyzing the Funnel Plot graph (Sample size versus Effect size), using the Cohen test (d).

Results and Discussion

Summary of Findings

A total of 96 articles were found that were subjected to eligibility analysis, with 27 final studies being selected to compose the results of this systematic review. The studies listed were of medium to high quality (Figure 1), considering the level of scientific evidence of studies such as meta-analysis, consensus, randomized clinical, prospective, and observational. The biases did not compromise the scientific basis of the studies. According to the GRADE instrument, most studies showed homogeneity in their results, with $X^2=67.9\%>50\%$. Considering the Cochrane tool for risk of bias, the overall assessment resulted in 12 studies

with a high risk of bias and 10 studies that did not meet GRADE and AMSTAR-2.

Figure 1. Article selection and exclusion process.

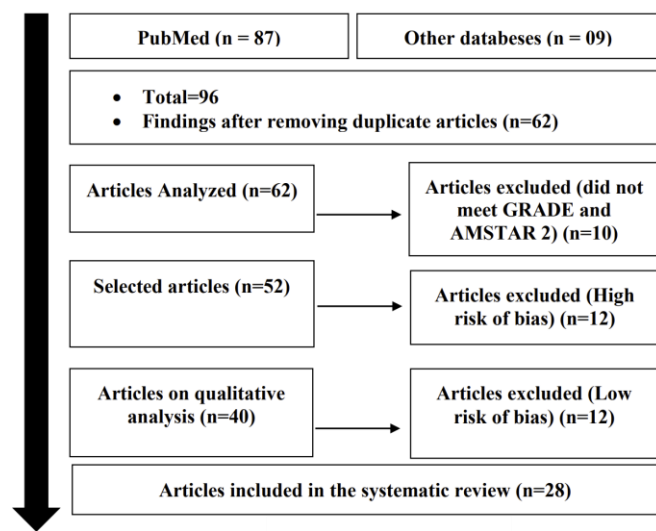
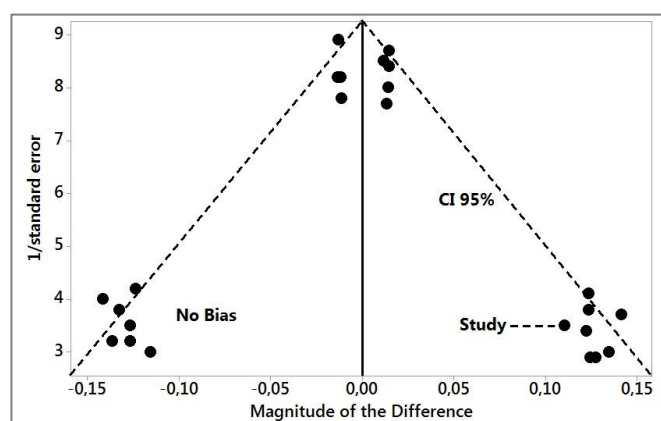


Figure 2 presents the results of the risk of bias of the studies using the Funnel Plot, showing the calculation of the Effect Size (Magnitude of the difference) using the Cohen Test (d). Precision (sample size) was determined indirectly by the inverse of the standard error (1/Standard Error). This graph had a symmetrical behavior, not suggesting a significant risk of bias, both between studies with a small sample size (lower precision) that are shown at the bottom of the graph and in studies with a large sample size that are presented at the top.

Figure 2. The symmetric funnel plot suggests no risk of bias among the small sample size studies that are shown at the bottom of the graph. High confidence and high recommendation studies are shown above the graph (n=28 studies).



Source: Own authorship

The number of people seeking to undergo the bichectomy (BC) procedure to acquire a younger-

looking face, with a harmonious pattern, has increased significantly. However, there are few studies on tissue behavior with post-operative patient follow-up [1,2].

In this sense, in the literature, studies that describe the management of the Bichat's fat ball with the objective of facial harmonization are restricted to case reports or series of cases [1-3]. Although there are reports of late postoperative monitoring and evaluation, none of the studies statistically evaluate tissue behavior. However, several studies have presented the importance of using Bichat's fat ball as an oral layer in the closure of fistulas and also to cover bone grafts in implant dentistry, as well as for the reconstruction of extensive defects caused by tumors in the maxillofacial region, aiming to avoid its removal [2-5].

Within facial surgeries, BC is a surgical procedure with an aesthetic-functional purpose that removes the structure known as Bichat's fat ball, which in some cases makes the patient appear to be overweight and without harmony in the facial shape/contour in the latero-lateral axis, as well as helping to reduce the successive trauma caused by dental occlusion in the oral mucosa in the cheek area [5,16-20].

At an aesthetic level, performing BC thins the middle third of the face, outlining and highlighting the bone angulations of the zygomatic region, contributing to more pleasant facial aesthetics. However, there are few studies clearly describing the intraoral bichectomy technique, the main one being the study published by Matarasso in 2006 [21].

The most complete anatomical study carried out suggests that deficient development of facial ligaments, ligament laxity secondary to facial aging, and/or rupture of the fat pad could cause the prolapse or fall of Bichat's fat into the mouth or subcutaneous tissue [13].

There is still no assessment of the degree of satisfaction obtained through satisfaction questionnaires after facial procedures. Therefore, objective studies are necessary to quantify and qualify the degree of satisfaction obtained after BC. Furthermore, most patients who undergo BC also combine other complementary procedures, which can influence the final quality of the result and the level of patient satisfaction [5].

This fact can be evidenced by the application of Botox in the cheek muscles (masseter muscle), filling with Hyaluronic Acid in lip filling, filling in the Malar region (zygomatic or cheekbones), and filling the edges of the jaw, application of PRP (Platelet Rich Plasma), Placement of Support Wires [2,5].

In this sense, some authors described that the removal of the oral fat pad for aesthetic purposes highlights the superiority of results with associated procedures [2,4,6]. According to Jackson et al. (2003)

[16], the results of Bichat's fat ball removal alone can produce practically imperceptible results when not indicated correctly. Therefore, more studies are needed to evaluate the results of isolated BC.

In a case series study, a rate of 7.5% of complications was analyzed, all of which were reversed in less than two weeks after surgery. No major complications were observed, such as definitive nerve injuries or bleeding, requiring reintervention or the use of electrocautery, proving the safety of the procedure when performed under appropriate conditions [9]. Furthermore, it is believed that performing the surgery under general anesthesia and in a hospital environment, with adequate visualization of the dissection and intraoperative blood pressure control, additionally contributes to the safety of BC [9,21-24].

In this context, to avoid complications, scissors or sharp instruments should not be used inside the "tunnel" [25]. The dissection must be carried out bluntly and delicately, as a direct injury due to transfixion of buccal branches or the parotid duct is very unlikely, as is more significant bleeding due to injury to the transverse facial vein or artery. Therefore, BC should never be trivialized, and the delicate anatomical region in which it is performed must always be respected, as well as its appropriate indication [22,25].

To corroborate this, Montero et al. (2018) [22] stated that knowledge of the anatomy around the Bichat fat pad, as well as its clinical applications, is essential to indicate and safely perform its removal. This surgery is indicated not only for aesthetic purposes but also for functional reasons. When used appropriately, Bichat's fat pad is composed of stem cells that have a similar phenotype to adipose stem cells, useful in the treatment of pathologies and/or complications such as perforation of the maxillary sinus membrane, oroantral/oronasal communications, peri-implantitis, ulcers, fibrosis of the oral mucosa, reconstruction of soft tissues, among others.

In this sense, due to its location, it is prone to suffering clinically significant pathologies, as well as constant trauma [26]. Therefore, to indicate and/or perform surgical procedures involving the Bichat fat pad, it is essential to know its anatomy and possible applications, not only for aesthetic purposes but also for functional purposes. The application of Bichat fat and its removal should be evaluated, being an alternative in patients who constantly suffer mucosal damage during masticatory function [22,27].

As an indication for the treatment of complications, super selective microcatheter angiography and embolization are an effective modality for immediate treatment of bleeding from facial injury and refractory epistaxis when local methods fail to achieve hemostasis,

avoiding the need for further surgical exploration and providing accurate diagnosis and therapeutic modalities in a minimally invasive manner. Super-selective angiography was used to study branches of the internal maxillary artery. Super-selective embolization using microspheres was then performed to control bleeding [2,3].

Therefore, in the case of refractory surgical measures, super-selective micro-catheter angiography and embolization provide an alternative to localizing and controlling severe small artery bleeding. This may be ideal in cases that would otherwise require extensive dissection and in regions of complex anatomy, which may compromise aesthetic results [3].

Reports in the literature are scarce regarding the removal of Bichat's fat ball from the face and its relationship with successive trauma events to the buccal mucosa [20]. In this sense, oral submucous fibrosis is a serious, chronic, and disabling condition, where the use of Bichat's fat ball makes up the range of procedures that can be performed to treat this pathology. Several authors sought to evaluate the use of different techniques in comparison with Bichat's fat ball removal to minimize the main symptom of this condition [10,20,22,26].

Finally, a randomized clinical study carried out by the authors Pimentel et al. (2023) evaluated the influence of removing the Bichat ball on postoperative inflammatory parameters (pain, edema, and trismus), reduction in facial volume, facial aesthetic satisfaction, and quality of life-related to oral health. A total of 21 patients underwent Bichat ball removal. The peak of pain occurred after 2 hours and, 10 hours later, levels returned to baseline values. Rescue medication consumption peaked in the first 24 hours, reducing significantly after 72 hours. Mean mouth opening decreased after 24 hours and returned to baseline levels after 1 month, and all linear facial measurements reduced significantly after 1 or 3 months. OHIP-14 and FACE-Q SFAOS scores showed significant improvement after 1 month, but patients aged > 25 years showed a significant reduction in FACE-Q SFAOS at the end of the study [28].

Conclusion

It was concluded that on an aesthetic level, performing a bichectomy thins the middle third of the face, outlining and highlighting the bone angulations of the zygomatic region, contributing to more pleasant facial aesthetics. Surgical removal of the Bichat's fat ball induces a mild inflammatory process controlled by rescue medication, significantly reduces facial volume, and improves the quality of life and satisfaction with facial aesthetics 3 months postoperatively. Several

studies have presented the importance of using the Bichat ball as an oral layer to close fistulas and also to cover bone grafts in implant dentistry.

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Ethical Approval

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Informed consent

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Data sharing statement

No additional data are available.

Conflict of interest

The authors declare no conflict of interest.

Similarity check

It was applied by Ithenticate®.

Peer Review Process

It was performed.

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