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Complications of buccal fat removal: A Review

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Background
In recent decades, bichectomy has become a highly requested procedure in plastic surgery practices, which has led to a wide variety of physicians beginning to develop the technique. However, although at first glance it appears to be a simple procedure, the complexity of the region demands specific anatomical knowledge to prevent complications that, although generally mild, can become serious in the least of cases.

Keywords: Buccal fat removal, complications.

Review article

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The Bichat fat pad (BFP) is a fatty body present in the cheeks, which was first identified by the German Laurentius Heister, who considered it a gland, but it was not until 1802, when the French Marie François Xavier Bichat delved into its study, discarding Heister's hypothesis and found that its nature is merely adipose[1-2]. This anatomical structure has a close relationship with the masticatory muscles, performing a cushion function between them. Structurally, the BB is limited by a thin capsule of fibrous tissue and has a pyramidal shape. The BB derives its innervation from the buccal and zygomatic branches of the VII cranial nerve, as well as from the buccal nerve on its internal face, and its vascular supply comes from the superficial temporal arteries, the buccal branch of the maxillary artery, and the facial artery, whose vein homonym performs the venous drainage of the region[3].

In 1986, Tideman et al described its function as a vascular supply in the region of the cheek and cheeks and its usefulness as an anatomical resource for the management of oronasal and oroantral lesions, as well as anatomical graft, which gave it greater relevance in maxillofacial surgery[4-8]. However, despite its wide utility in different therapeutic procedures, this is not the reason why this anatomical structure has received so much attention, if not until the last 20 years, when its surgical removal (buccal fat removal) has increased its demand in recent years. reconstructive, aesthetic, maxillofacial and even dental surgery offices in all parts of the world[9]. Although at first glance it might be thought that it is a simple procedure performed in expert hands, the complexity of the region demands specific anatomical knowledge to prevent complications that become serious in the least of cases[10].

HISTORICAL EVOLUTION IN BFP SURGERY

Extraction via the intraoral route through incisions through the cheek, which represents the traditional technique and the most widely used worldwide, was first described for aesthetic purposes in 1989, after dissecting and studying 15 cadavers[11]. The purpose of this removal is to decrease the volume of the oral region, achieving a safe facial contouring, achieving at the same time an increase in malar prominence, giving a younger and more aesthetic appearance with very low morbidity and a high rate of patient satisfaction patient[12].

In Dentistry, the clinical application of the buccal fat pad has an aesthetic purpose and can be removed or repositioned[13]. Its extraction has been described in order to avoid intraoral trauma to the cheek and the repositioning of the pedicle has been described for protection or to be used as a graft. Complications from surgical removal of the buccal fat

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	Subcutaneos emphysema	Bleeding/hematoma	Infection	Exacerbated edema	Paresthesia	No major complication	Total
Bandage	1	2		8	1	534	546
No bandage	1	2	2	12		80	97

Table 1. Incidence of complications with use and no use of bandage after buccal fat removal[14].

pad are rare, however, bruising, infection, facial nerve and facial vessel injury may occur. The therapies involved in it include drug therapy, drainage, laser therapy, and compression bandaging[14].

SURGICAL TECHNIQUE OF THE INTRAORAL APPROACH

The most critical landmark to identify before making an incision during the intraoral approach is the papilla of Stensen's canal, located in the vestibule at the level of the maxillary second molar. Before incision, cleaning of the oral cavity with an antiseptic chlorhexidine mouthwash is recommended, followed by injection of lidocaine mixed with epinephrine 1:100,000 into the gingivobuccal sulcus at the level between the first and second upper molars. A 1.5 cm intraoral incision is then made approximately 1 cm below the ampulla of Stensen's duct[1,11].

Blunt dissection is continued downward through the mucosa and buccinator muscle, while the fascia is gently extended until the fat pad is evident. The fat pad can be exteriorized in the mouth by gentle traction coupled with the application of external pressure to the cheek and gentle dissection with sterile cotton-tipped applicators[15,16].

By avoiding excessive pulling or pulling, the surgeon can avoid resection and/or injury to the parotid duct or adjacent branches of the facial nerve.

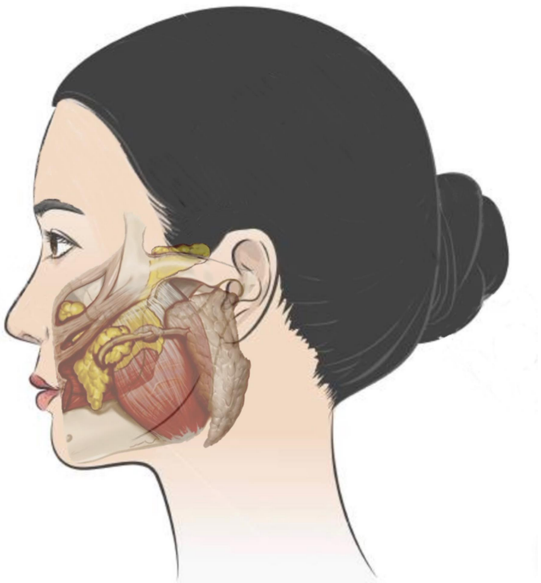

Figure 1. Schematic representation about BFP anatomy and its relationships.

Excessive traction or aggressive dissection will likely result in removal beyond the buccal extent of the buccal fat pad, which may contribute to an over-dug appearance. Electrocautery is used to cauterize the base of the fat pad prior to resection to ensure that the pedicle and base are cauterized.

In most publications it has been documented that the typical volume of fat resected ranges from 3 to 5 g per side, however it varies according to the characteristics of the patient and may not be the same on both sides depending on the appearance. preoperative, trying to achieve facial symmetry. The incision is closed with 4-0 absorbable chromic sutures and patients are kept on a bland diet for approximately 48 – 72 hours.

COMPLICATIONS

The anatomical structures most closely related to Bichat's fatty ball and most frequently involved in surgical complications are the parotid gland duct, facial nerve branches, blood vessels, and muscle tissues, which coincide with the most common complications. frequently described, which are: extensive hemorrhage, facial nerve impairment, facial asymmetry, and trismus[17].

Despite the fact that there are few statistics on the complications described in buccal fat removal because most of the procedures are performed in private health services, one of the cohorts with the largest number of patients is that of Grillo et al.[14], who reports the following data in a group of patients in whom a bandage was used after surgery vs. the control group in whom no prophylactic measure was used after surgery [Table 1].

Section of parotid duct

One of the most frequent complications and the most complex management is the complete section or partial lesion of the Stensen's duct (or parotid duct), due to its proximity to the initial incision site; however, its incidence has not been accurately documented. The manifestations that we can identify in the patient in whom Stensen's duct has been injured generally presents with a soft, painless and mobile mass within the parotid region (sialocele), and possibly also intraoral serous drainage from the wound. Patients may also experience cheek swelling or increased drainage with ingestion of food.

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The initial step is to confirm that the manifested volume increase corresponds to a sialocele, which can be determined indirectly by measuring amylase in the aspirated fluid with a value greater than 1000 U/L[18]. However, the method that helps us confirm the lesion and determine its situation is the sialogram, a radiological study, in which the parotid duct is cannulated with a retrograde injection of contrast medium and its extravasation is evaluated, locating the site of the lesion[19-21].

Treatment of iatrogenic parotid duct injury is generally performed in a stepwise and standardized manner, from the most to the least invasive. Starting with antisialagogue drugs such as glycopyrrolate, atropine, ipratropium bromide and scopolamine, however, these drugs frequently present adverse effects typical of their pharmacodynamics, such as constipation, mucosal sequelae, vision disturbances, drowsiness, headache, nausea and vomiting and visual disturbances[22-24].

Although there is no consensus on treatment modalities, pharmacological control with isolated antisialagogues, pharmacological therapy with serial percutaneous needle aspiration added to compression bandages, antibiotic therapy, botulinum toxin and surgical treatment have been described. which may consist of duct repair, bypass, ligation, stenting and drainage and in some cases even parotidectomy[20].

Bleeding or haematoma

It is important to remember that the irrigation of the Bichat fatty ball comes from branches of the maxillary, superficial temporal, and facial arteries, all of which originate in the external carotid, so its flow is high, producing profuse bleeding that is difficult to reduce in the case of any of them is injured. It is possible to identify these types of lesions when a deep dissection is performed in the bed of the PBF or if a vascular avulsion by traction is performed during the blunt dissection[25].

Initially, local measures are recommended, such as compression and suturing of the blood vessels, however, if hemostasis is not achieved, measures must be implemented to avoid the loss of blood volume that has hemodynamic repercussions in the patient. To achieve hemostasis, techniques have been described such as the prophylactic placement of compression bandages in patients in whom profuse bleeding has been identified during the procedure or despite not having documented bleeding, the classic vessel ligation techniques, and even in one case reported by Mourat et al[26], in a patient who underwent transoral buccal fat removal that required angiography and embolization secondary to massive hemorrhage from the left sphenopalatine artery.

Conclusion

Due to the fact that the procedures that involve the mobilization or the partial or complete resection of the BFP are mostly carried out for aesthetic purposes and in the private environment, there are not numerous statistics on the incidence or management of complications, however the most frequently detected are hemorrhage, lesion of the parotid duct and involvement of the branches of the facial nerve. However, all these complications can be observed in other types of surgery that involve the submaxillary region, so management can be similar to that established for other scenarios. The location of the BFP gives it important anatomical relationships on its anterior and lateral faces and although its transoral approach seems simple, the surgeon must know the three-dimensional anatomy of the structure on which he is working to avoid patient morbidity.

Conflicts of interests

There was no conflict of interest during the study, and it was not funded by any organization.

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References

1. Matarasso A (1991) Buccal fat pad excision: aesthetic improve- ment of the midface. Ann Plast Surg 26(5):413-418.
2. Shoja, M. M.; Tubbs, R. S.; Loukas, M.; Shokouhi, G. & Ardalan, M. R. Marie-François Xavier Bichat (1771-1802) and his contributions to the foundations of pathological anatomy and modern medicine. Ann.Anat., 190(5):413-20, 2008.
3. HERNÁNDEZ, O.; ALTAMIRANO, J.; SOTO, R. & RIVERA, A. Relaciones anatómicas del cuerpo adiposo de la mejilla asociadas a complicaciones de bichectomía. A propósito de un caso. Int. J. Morphol., 39(1):123-133, 2021.
4. Egyedi P (1977) Utilization of the buccal fat pad for closure of oro-antral and/or oro-nasal communications. J Maxillofac Surg 5(C):241–4
5. Dean A, Alamillos F, García-López A, Sánchez J, Penãlba M (2001) The buccal fat pad flap in oral reconstruction. Head Neck 23(5):383–388
6. Flis DW, Burke JF, Benet A, Theodosopoulos P, Aghi M, El-Sayed IH (2018) The endoscopic buccal fat pad flap for closure of skull base defects: a report of 5 cases. World Neurosurg 110:e42–e45.
7. Esen A, Akkulah S (2021) Management of large oroantral fistulas caused by medication-related osteonecrosis with the combined sequestrectomy, buccal fat pad flap and platelet-rich fibrin. J Maxillofac Oral Surg 20(1):76–82

 DOI 10.5281/zenodo.7894249

8. Altschiller-Mardones, J.; Noguera-Pantoja, A.; Muñoz-Zavala, T.; Pooley- Donoso, P. & Sole-Ventura, P. Buccal fat pad indications as a flap and autologous graft in maxillofacial surgery. Narrative review. Int. J. Odontostomatol., 12(4):362-7, 2018.
9. Rohrich RJ, Stuzin JM, Savetsky IL, Avashia YJ, Agrawal NA, Prada M. The role of the buccal fat pad in facial aesthetic surgery. Plast Reconstr Surg. 2021;148(2):334-338. doi: 10.1097/PRS.0000000000008230.
10. Zhang HM, Yan YP, Qi KM, Wang JQ, Liu ZF. Anatomical structure of the buccal fat pad and its clinical adaptations. Plast Reconstr Surg. 2002;109(7):2509-18 discussion 2519-20. doi: 10.1097/00006534-200206000-00052]
11. Stuzin JM, Wagstrom Lk, Kawamoto HK, Baker TJ, Wolfe SA (1990) The anatomy and clinical applications of the buccal fat pad. Plast Reconstr Surg 85(1):29–37
12. Guerrerosantos J, Manjarrez-Cortes A (1989) Cheek and neck sculpturing: Simultaneous buccal fat pad removal and subcutaneous cheek and neck lipoplasty. Clin Plast Surg 16(2):343–353
13. Martin-Granizo R, Naval G, Costas Um, Goizueta C, Rodriguez F, Monje F, et al. Use of buccal fat pad to repair intraoral defects: review of 30 cases. Br J Oral Maxillofac Surg. 1997;35(2):81-4.
14. Grillo, R. De la Puente, JL. Et al. Effectiveness of bandage in the incidence of major complications on buccal fat removal: literature review and case series of 643 bichectomies. Oral and Maxillofacial Surgery (2022) 26:511–517.
15. Matarasso A. Managing the buccal fat pad. Aesthet Surg J. 2006;26(3):330-336. doi: 10.1016/j.asj.2006.03.009
16. Matarasso A. Commentary on: The excision of the buccal fat pad for cheek refinement: volumetric considerations. Aesthet Surg J. 2019;39(6):593-594. doi: 10.1093/asj/ sjy260
17. Pimentel T, Hadad H, Statkievicz C, Alcantara-Júnior AG, Vieira EH, Souza FÁ, Garcia-Júnior IR. Management of Complications Related to Removal of the Buccal Fat Pad. J Craniofac Surg. 2021 May 1;32(3):e238-e240. doi: 10.1097/SCS.0000000000006964. PMID: 32868718.
18. Doctor VS, Rafii A, Enepekides DJ, Tollefson TT. Intraoral transposition of traumatic parotid duct fistula. Arch Facial Plast Surg. 2007;9(1):44-47. doi: 10.1001/archfaci.9.1.44
19. Gordin EA, Daniero JJ, Krein H, Boon MS. Parotid gland trauma. Facial Plast Surg. 2010;26(6):504-510. doi: 10.1055/s-0030-1267725
20. Capaccio P, Paglia M, Minorati D, Manzo R, Ottaviani F. Diagnosis and therapeutic management of iatrogenic par- otid sialocele. Ann Otol Rhinol Laryngol. 2004;113(7):562- 564. doi: 10.1177/000348940411300709
21. Van Sickels JE. Management of parotid gland and duct in- juries. Oral Maxillofac Surg Clin North Am. 2009;21(2):243- 246. doi: 10.1016/j.coms.2008.12.010
22. Arnaud S, Batifol D, Goudot P, Yachouh J. Nonsurgical management of traumatic injuries of the parotid gland and duct using type A botulinum toxin. Plast Reconstr Surg. 2006;117(7):2426-2430. doi: 10.1097/01. prs.0000219132.34809.ae
23. 24. Marchese-Ragona R, Marioni G, Restivo DA, Staffieri A. The role of botulinum toxin in postparotidectomy fistula treat- ment. A technical note. Am J Otolaryngol. 2006;27(3):221- 224. doi: 10.1016/j.amjoto.2005.09.009
24. Alcântara MT, Ribeiro NR, Abreu DF. Complications associated with buccal fat removal surgery: a literature review. Minerva Dent Oral Sci. 2021 Aug;70(4):155-160. doi: 10.23736/S2724-6329.20.04415-5. Epub 2020 Nov 3. PMID: 33138350.
25. Klüppel L, Marcos RB, Shimizu IA, Silva MAD, Silva RD. Complications associated with the buccal fat removal surgery. RGO, Rev Gaúch Odontol. 2018;66(3):278-284. http://dx.doi.org/10.1590/1981-86372018000300000143488
26. Moura LB, Spin JR, Spin-Neto R, Pereira-Filho VA. Buccal fat pad removal to improve facial aesthetics: an established technique? Med Oral Patol Oral Cir Bucal. 2018 Jul 1;23(4):e478-e484. doi: 10.4317/medoral.22449. PMID: 29924767; PMCID: PMC6051676.

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