The Buccal Fat Pad in the Closure of Oro-Antral Communications: An Illustrated Guide

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Abstract: **This article is intended as an illustrated, step-by-step guide in the use of the pedicled buccal fat pad in the closure of oro-antral communications. The advantages and disadvantages of its use are discussed, along with its basic anatomy.**

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Clinical Relevance: **The oro-antral communication is a significant complication following maxillary molar and premolar extractions.**

The oro-antral communication is a well-documented postoperative complication associated with the extraction of maxillary molar and premolar teeth.

The buccal fat pad (BFP) had a limited clinical importance for many years and was usually considered a surgical nuisance because of its accidental encounter either during various operations in the pterygomaxillary space or after injuries to the maxillofacial region.[1,2]

The use of the BFP to close oro-antral defects as a pedicled flap was first documented by Egyedi,[3] in 1977, and has been shown to be extremely successful in numerous cases since.[4,5]

The BFP is a biconvex disc of vascularized fat lying behind the zygomatic arch. There are four processes, the buccal process, the pterygoid process, the superficial process and the deep temporal process. These extend from the body to the surrounding tissue spaces such as the pterygomandibular space and the infra-temporal space.[6] The arterial supply to the BFP depends on small branches of the maxillary, superficial temporal and facial arteries. The size of the BFP is fairly constant among individuals, regardless of the overall body weight and fat distribution.[7]

Since 1998, the BFP flap has been used extensively within the Oral and Maxillofacial Department of Mid-Yorkshire Hospitals for the closure of oro-antral communications and in the reconstruction of minor oral defects under both general and local anaesthesia; no flaps have failed with only minor postoperative complications noted.

As the general dental practitioner or surgical dentist may well be faced with the need to close an oro-antral communication created during removal of maxillary molar teeth, it may be helpful to understand this simple, but effective, technique for repair.

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PROCEDURE

- The sinus tract is identified (Figure 1). Following identification, the sinus tract is excised (Figures 2 and 3). The sinus specimen should be sent for histology as, although very rare, malignancy has been found in the lining of an oro-antral communication in our experience.
- A full thickness buccal

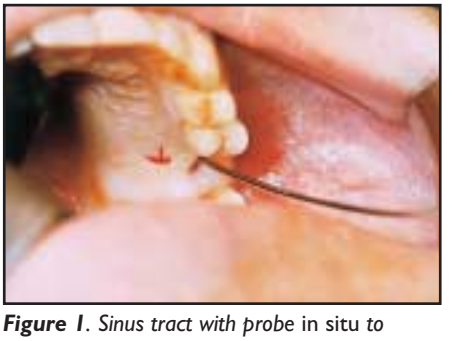

***Figure 1**. Sinus tract with probe in situ to demonstrate defect.*

***Figure 2.** Initial incisions for excision of sinus tract and mucoperiosteal flap.*

***Figure 3**. Excised sinus tract specimens.*

***Figure 4**. Raised mucoperiosteal flap and resultant oro-antral communication.*

***Figure 5**. Incising the periosteum of the reflected flap.*

mucoperiosteal flap is now raised (Figure 4).

- The BFP is now approached by horizontal incision through the periosteum after the mucoperiosteal flap has been reflected (Figure 5). The incision within the periosteum, as well as providing access to the BFP, also increased the mobility of the flap (Figure 6). An artery clip is now introduced through the periosteal incision aiming cranially in the third molar or disto-cranial in the region of the first molar tooth. The clip is opened and withdrawn creating a submucosal tunnel until the BFP appears (Figure 7). The first layer of fat seen is dark yellow and has small lobulations. This is not the buccal fat pad which lies slightly deeper and is more pale and smooth in appearance.
- The BFP is now teased out carefully into the oral cavity until sufficient is obtained to obturate the defect. Care must be taken when removing the BFP only to clasp it at its most distal aspect so as not to damage its blood supply (Figure 8).
- The wound edges around the defect are now excised to produce raw edges overlying bone. The BFP is secured in position by 4/0 Vicryl vertical mattress sutures with the knot on the palatal aspect. Further suspensory sutures can be placed through the palatal mucosa and the BFP to provide extra support and prevent the BFP from being pulled buccally. The buccal mucoperiosteal flap can now be replaced in its original position if buccal sulcus depth is of concern (Figure 9) as the BFP has been shown to epithelialise readily within two to three weeks.[4] If buccal sulcus loss is of no concern, an additional layer can be provided by a Rehrmann buccal advancement flap. This is easily achieved owing to the elasticity of the flap, which has been created by the incision in the periosteal layer (Figure 10).
- Postoperatively, the patient is given antibiotics and decongestants (amoxycillin 500 mg tds and xylometazoline hydrochloride 0.1%, 2–3 drops into each nostril 3 times daily for 1 week) and advised not to blow his/her nose. Mucosal healing is normally complete within 3–4 weeks.

DISCUSSION

It is hoped that this article with its illustrations and explanations has shown the BFP technique to be a simple but useful tool in the armamentarium of the operator attempting to close an oro-antral communication. In our hands it has had a 100% success to date in over 50 cases. It is recommended where loss of sulcus depth is of concern, or where the buccal advancement flap has failed. It also has much to commend it as a primary measure, particularly with large

***Figure 6.** Demonstrating the increased mobility of the flap once periosteum incised.*

***Figure 7.** Buccal fat pad delivered into the oral cavity.*

***Figure 8.** Buccal fat pad fully delivered into the oral cavity.*

***Figure 9.** The buccal fat pad secured in place with no mucosal covering.*

defects. The lack of any failure may suggest it should be used in all cases, as one could be confident of a successful closure in almost every case and therefore expose the patient to only one procedure. A possible disadvantage of this approach is (on our anecdotal observation alone) the slight increase in swelling patients get when compared to

Figure 10. *The buccal fat pad secured with additional Rehrmann buccal advancement flap.*

a buccal advancement flap only. In conclusion, however, the PFP is an extremely reliable and versatile flap for use in intra-oral surgery and, in particular, for the successful closure of the oro-antral communication.

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BOOK REVIEW

Tip-Edge Orthodontics. By Richard Parkhouse. Elsevier Science, London, 2003 (185 pp., £95.00). ISBN 0723432287.

The preface outlines that the impetus for this book was world wide demand for a comprehensive textbook outlining the use and possibilities of a relatively new appliance system. The Tip-Edge bracket was invented by Dr Peter Kesling by modification of a .022 slot simple Edgewise bracket so as to allow differential tooth movement within an Edgewise based bracket system. The concept of differential tooth movement is explained in Chapter 2. It involves first tipping the crown in the direction of the desired movement, followed by root uprighting in the latter half of treatment. This principle, allied to the use of light continuous forces, is the essence of the Tip-Edge philosophy.

Chapter 3 describes Tip-Edge bracket and molar tube design with the aid of clear diagrams whilst the three main auxiliaries; the Side-Winder, the Power Pin and the Rotating Spring are covered in Chapter 4. The three main treatment stages outlined in Chapter 5 will be familiar to those who remember the Begg technique. It is here that the familiar chatty style first begins to be seen. This reader began to smile, rather like the audience in a Parkhouse lecture, knowing that I was in for a treat. Clinical tips abound, some obvious, others derived from a wealth of clinical experience, starting from the recommendation to cur away the horizontal section of a placement jig in order to permit correct bracket positioning. Why did the manufacturer not think of this? The 'Irish Jig' is another classic!

Begg philosophy and mechanics underpin the descriptions of Stage 1 treatment in Chapters 7–10, even to the use of Wilcock Special Plus wire which may challenge the rusty wire-bending skills of those who have become accustomed to fitting straight-wire arches directly from the packet. There is an excellent section on patient instruction at the end of Chapter 8.

The use of Side-Winders to 'apply the brakes' and vary the anchorage during space closure, which was mentioned in Chapter 2, is further explained in Chapter 11 and root uprighting is covered in Chapters 14–18. Precision finishing takes up Chapter 19.

The text and occasional illustrations are supported by records of 11 treated cases. Each of the main malocclusion types is included and several cases are rather daunting. However, all end up with the 'film star smile' promised at the start of Chapter 14.

The beautiful presentation of the book makes it a pleasure to hold and to read. Layout and colour balance of photographs is first class and line diagrams are well drawn and of good size.

Book reviews can be a chore. This one was a delight, the text is well organized, concise and witty. It is all so clear and cross-referenced to straight-wire practise that many may feel sufficiently confident to have a go without further instruction. This may be an imprudent suggestion but the answers to most likely problems must lie within the pages of this book. Whether you use Tip-Edge at present, intend to do so, or practice orthodontics in any way, you should read it.

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