Chapter 17

Management of the Mass in the Buccal Space

17

Rohan R. Walvekar and Eugene N. Myers

Contents

Core Features

- To provide a concept of the three-dimensional anatomy of the buccal space.
- To describe the clinical presentation and specific features of buccal space tumors.
- To discuss the advantages, disadvantages, and rationale for various surgical approaches to the tumors of the buccal space.

Complications to Avoid

- Excellent exposure of the mass and buccal branches of the facial nerve will help to avoid damage to the facial nerve.
- Damage to Stensen's duct with resultant sialocele can be avoided by using the external approach.

Introduction

The mass in the substance of the cheek, also known as the "buccal space" presents a diagnostic and therapeutic challenge. A mass appearing in the buccal space usually suggests a tumor arising in the buccal space or the accessory lobe of the parotid gland. These tumors are unusual and present in a unique fashion. The diagnosis of these lesions is often difficult to make. A detailed clinical examination and imaging studies are helpful in defining the location and extent of these tumors. However, the definitive diagnosis of a mass in the buccal space is obtained by excision of the mass and histopathological evaluation. A variety of benign and malignant lesions may arise within

the buccal space. Some more commonly occurring lesions include benign and malignant tumors of salivary gland origin, lymphoma, lipomas (see Fig. 17.1), and metastasis from a distant site. There are many reports describing various masses in the buccal space and several surgical approaches have been described in the literature [10, 18–20, 25, 26, 29, 34, 40]. Table 17.1 lists lesions reported within the buccal space [1–6, 8, 10, 14–16, 21–23, 26–28, 32, 33, 35–40]. The surgical management of these tumors is challenging because the operative technique must provide good exposure, prevent damage to the facial nerve and Stensen's duct, and have a good cosmetic result.

Anatomy of the Buccal Space

The head and neck surgeon must have an understanding of the three-dimensional anatomy of the buccal space, in order to provide safe surgical therapy [10, 34]. Madorsky and Allison mention that the buccal space was first described in 1935 by Coller and Yglesias, and Kostrubala in 1945 further subdivided the masticator space into temporal, infratemporal, retrozygomatic, and buccal, describing the extent of these spaces [25]. Kostrubala described the buccal space as being a fascial space in the mid-cheek, anterior to the masticator space and anterior to and separate from the parotid gland [18]. Figure 17.2 is a schematic illustration of the buccal space and its contents. The anatomical boundaries of the buccal space include the buccinator muscle medially with its overlying fascia, extending superiorly to the zygoma and inferiorly to the mandible [10]. The anterolateral wall of the buccal space is formed laterally by the skin and superficial layer of the deep cervical fascia and medially by the muscles of facial expression [15]. The anterior limit of the buccal space is defined by the orbicularis oris muscle [10]. The posterior wall of the buccal space is formed by the masseter muscle, mandible, lateral and medial pterygoid muscles, and the parotid gland. The buccal space frequently communicates posteriorly with the masseteric space through deficiencies in the parotidomasseteric fascia [15]. There are no true superior or inferior boundaries to the buccal space, however, these are formed as the superficial layer of the deep cervical fascia attaches to the periosteum of the zygomatic arch and mandible, respectively [10, 15].

Most of the buccal space is filled with adipose tissue that has been termed the "buccal fat pad" and lymph nodes. The buccal fat pad has also been described as "Bichat's

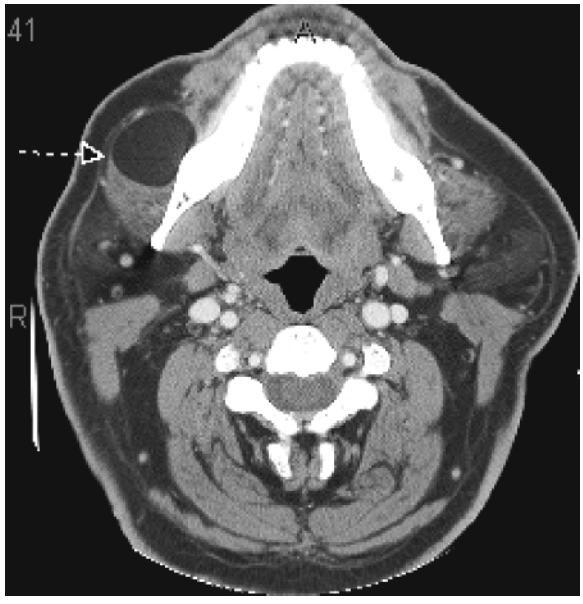

Fig. 17.1: Lipoma of the buccal space

fat pad" or the "suctorial fat pad" and has been studied in great detail by Gaughran in 1957 [25]. The buccal fat pad with its extensions can serve as a conduit for the spread of infections or tumors originating in the oral cavity or parotid gland [10, 15]. Other important contents of the buccal space include the parotid duct (Stensen's duct), as it passes anteriorly from the gland to pierce the buccinator muscle opposite the second maxillary molar. The duct separates the buccal space into two equal-sized anterior and posterior compartments. Moving laterally, the anterior facial vein, the facial artery, and the lymphatic channels are encountered. Even more laterally, the branches of the facial nerve can be located as they pierce the medial surface of several muscles of facial expression which form the deep portion of the lateral wall, such as the risorius, zygomaticus major, and levator labii superioris along with their fascia [10].

Superficial Musculoaponeurotic System (SMAS)

The SMAS was first described by Mitz and Peyronie in 1976 [29]. The SMAS is thought to be a fibrous degeneration of the platysma, or a distinct fibromuscular layer

Table 17.1. Lesions reported in the buccal space

Glandular	Vascular	Lymph node	Connective	Muscular	Inflammatory	Neural	Miscellaneous
Accessory parotid or aberrant salivary gland tumors	Hylanized thrombus[a]	Calcified node	Fibromatosis	Myositis ossificans	Abscess formation	Neurofibroma	Foreign body granuloma e.g., paraffinoma [15]
Mixed tumors (benign[a] and malignant)	False aneurysm	Benign reactive node	Lipoma	Masseteric hypertrophy	Bacterial abscess	Neuroma	Kimura disease [15]
Mucoepidermoid carcinoma (low- and high-grade)	Hemangioma	Lymphoma[a]	Liposarcoma		Aspergilloma		
Acinic cell carcinoma	Recurrent juvenile nasopharyngeal angiofibroma [3]	Lymphosarcoma	Spindle cell lipoma[a]		Sarcoidosis[a]		
Adenoid cystic carcinoma		Metastatic nodal involvement	Fibroma		Polymorphic low-grade adenocarcinoma [21]		
Carcinoma ex-pleomorphic adenoma		Lymphangioma	Fibrosarcoma		Tuberculous granuloma and adenoid cystic carcinoma presenting as a single buccal space mass [22]		
Metastatic clear cell carcinoma			Solitary fibrous tumor [5]		Clear cell carcinoma metastatic from kidney		
Chronic sialadenitis[a]			Rhabdomyosarcoma				

[a] Identifies the diagnoses of 10 patients treated between 1975 and 1985

Table 17.1. *(continued)* Lesions reported in the buccal space

Glandular	Vascular	Lymph node	Connective	Muscular	Inflammatory	Neural	Miscellaneous
Oncocytoma[a]			Pseudoherniation of buccal fat pad [27]				
Papillary cystadenoma lymphomatosum			Nodular fasciitis[a]				
Sebaceous adenoma[a]			Alveolar soft-part sarcoma of the head neck [16]				
Parotid duct tumor or calculus							
Minor salivary gland calculus							

[a] Identifies the diagnoses of 10 patients treated between 1975 and 1985

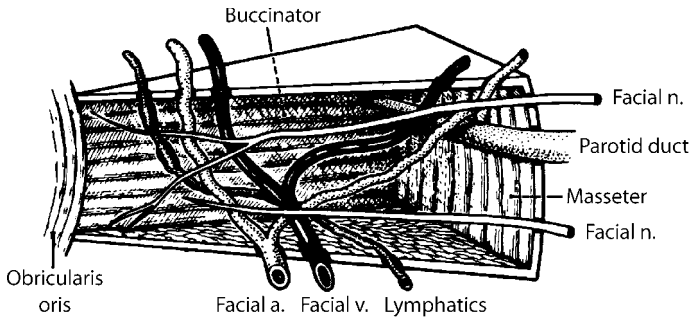

Fig. 17.2: Schematic illustration in oblique lateral view of left buccal space and its contents [10]. [Reprinted with permission from: Rodgers GK and Myers EN (1988) Surgical management of the mass in the buccal space. Laryngoscope 98:749–53]

composed of platysma muscle and parotid fascia, or an extension of the cervical fascia. There are several other explanations of the origins of the SMAS. The SMAS splits the subcutaneous layer in the face into a superficial layer that contains tenuous fat lobes interspersed with fibrous septa that insert into the dermis and a deeper layer which extends to the facial muscles and contains fat which is more abundant and less organized due to the absence of fibrous septation [7]. The SMAS is lateral to the facial nerve and the facial vessels. It is thicker over the parotid gland and is thinner in the mid-cheek area. It reinforces the contour of the face, and identification and repair of this layer is essential to minimize facial deformity following surgery for tumors in the buccal space [25].

Accessory Lobe of the Parotid Gland

One of the important differential diagnoses of a mass presenting in the mid-cheek area is the accessory lobe of the parotid gland. The accessory lobe of the parotid gland is an island of salivary gland tissue found anterior to and separate from the main parotid gland. Anterior processes or extension of the main parotid gland are not considered to be accessory parotid tissue [17]. Frommer, in cadaver studies, demonstrated that the accessory lobe of the parotid gland is found in approximately 21% of the population [9]. The accessory lobe is found along the line of the Stensen's duct in the soft parts of the cheek and is usually separated from it by an average of 6 mm [24, 31]. As a result a mass arising in the accessory parotid tissue presents in the central one third of a line drawn from the middle of the tragus to a point midway between the ala of the nose and the vermillion border of the upper lip, about a fingerbreadth below the zygomatic arch [31, 32]. The accessory lobe of the parotid gland drains through one or more ducts into the nearby Stensen's duct, and is usually closely related to the buccal space and zygomatic branches of the facial nerve [31]. The normal size of an accessory lobe of the parotid gland, when present, is described to be "pea-sized" or "lima bean-sized" varying from 0.5 to 2.5 cm in diameter, and is spheroidal in shape, firm in consistency, and separate from the overlying skin [14, 31].

One to eight percent of all parotid neoplasms arise within the accessory lobe of the parotid gland. The rate of malignancy has been reported to be from 26% to 50% [24]. The histology, variety, and distribution of neoplasms within the accessory lobe of the parotid gland are similar to those occurring within the main parotid gland. As with the main parotid gland, pleomorphic adenoma is the most common benign tumor. Most malignant tumors of the accessory lobe of the parotid gland are cancers of salivary gland origin. There are, however, a few reports of metastases to this site from primary tumors in the head and neck or distant sites [11, 17]. We recently encountered a case of metastasis of a renal cell carcinoma to the accessory lobe of the parotid gland (Fig. 17.3).

Preoperative Evaluation

Clinical Presentation and Physical Examination

A mass within the substance of the cheek poses a diagnostic problem. It may arise from any of the several types of tissues present in the buccal space. A detailed history, clinical examination, and imaging studies may suggest a specific etiology, however, the final diagnosis of buccal space masses is often elusive and must be confirmed by surgical removal and histopathological evaluation [10]. An accurate history and physical examination helps to

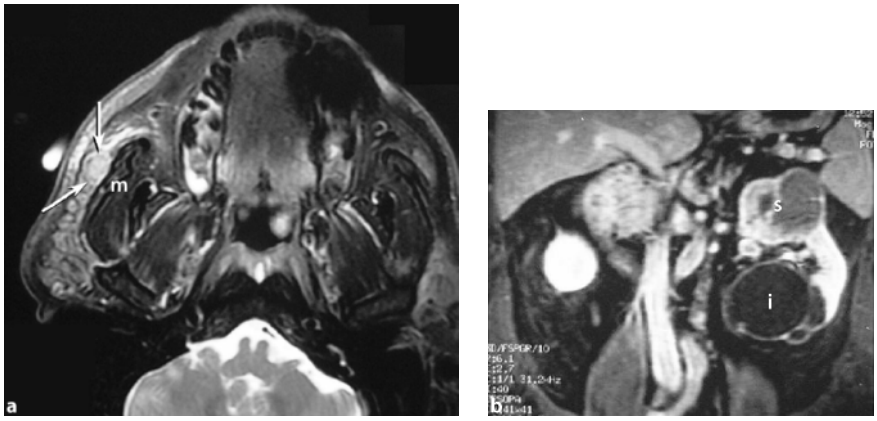

Fig. 17.3: **a** T2-weighted axial MRI through the parotid gland demonstrates a round 10-mm mass (*arrows*) overlying the masseter muscle (*m*). The mass has signal intensity slightly higher than the adjacent gland, but not high enough to be definitive for pleomorphic adenoma. This proved to be renal cell carcinoma metastatic to the accessory lobe. **b** Sagittal postcontrast spoiled-gradient MRI of the abdomen with T1 weighting shows two distinct masses in the left kidney. The superior mass (*s*) has cystic and solid components. The inferior mass (*i*) is predominantly cystic and has extensive septations

localize the site of the lesion as originating in the buccal space. Buccal space masses present in a unique fashion. The lesions in the buccal space are readily apparent because they are easily palpated just beneath the buccal mucosa or the skin of the cheek (see Fig. 17.4) [13]. The typical history encountered in patients with a mass in the buccal space is that of a slowly growing painless mass in the cheek, which disturbs the facial symmetry. These lesions are typically nontender and can be best assessed by a bimanual examination. They are not always well circumscribed and are often ill-defined merging with the adjacent buccal fat pad [10]. The mass may lie closer to the oral mucosa and the patient may be able to feel the intraoral mass with the tongue. When the mass presents in the oral cavity, the patients are often seen initially by their dentist or an oromaxillofacial surgeon. Skin involvement, facial nerve paralysis, Stensen's duct obstruction, and pain often all suggest indications of a malignant tumor within the buccal space, as benign tumors almost never produce pressure or obstructive symptoms [10].

Imaging

Imaging studies can provide valuable information that can help to limit the differential diagnosis of a mass in the buccal space. Kurabayashi et al. evaluated the computed tomography (CT) features of a buccal space mass in 53 patients [20]. CT images were assessed for the number, location, internal architecture, and margin of the lesions and their relation to the surrounding structures. Their series included 44 tumors (33 benign and 11 malignant) and 9 masses which were not tumors. The criteria used to diagnose malignant tumors included, ill-defined margins, violation of fascial planes, and aggressive bone destruction. CT was useful in demonstrating the presence and location of the masses in the buccal space, and sometimes aided in the differential diagnosis. However, the study concluded that CT had a limited value in differentiating malignant from benign lesions. Only 7 out of 11 malignant tumor were correctly identified (sensitivity 64%) [20].

Kurabayashi et al. also studied 30 patients with benign and malignant lesions in the buccal space using magnetic resonance imaging (MRI) [19]. The authors evaluated the MRI characteristics of lesions in the buccal space. They concluded that MRI was useful in demonstrating the extent of lesions in the buccal space because of its excellent soft tissue contrast, however, the sensitivity of predicting malignancy was very poor (29%). This was especially true for malignant tumors of minor salivary gland origin, which were typically seen as well-defined masses without infiltration into surrounding structures on MRI [19]. Table 17.2 lists the CT and MRI characteristics of tumors encountered commonly in the buccal space [15, 19, 20].

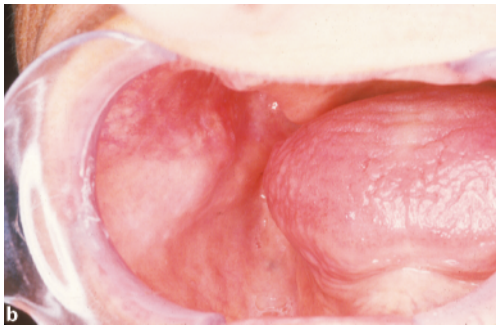

Fig. 17.4: **a** External view of a right buccal space mass. **b** Internal view. Note the intraoral bulge produced by the mass. [Reprinted with permission from: Rodgers GK and Myers EN (1988) Surgical management of the mass in the buccal space. Laryngoscope 98:749–53]

Positron emission tomography (PET) as well as PET-CT can also be useful in defining the location of the lesions and in forming the differential diagnosis. PET-CT scanning can also add valuable information that may alter management. Gomes et al. reported a case of high-grade mucoepidermoid carcinoma of the accessory lobe of the parotid gland in which the CT and MRI did not show any abnormality other than the primary lesion. However, an 18F-fluorodeoxyglucose (FDG) PET-CT scan showed multiple distant metastases. In view of this finding, curative treatment was deferred and the patient was offered palliation only [12].

Fine-needle Aspiration Biopsy (FNAB)

Fine-needle aspiration biopsy provides a valuable tool in the evaluation of a mid-cheek mass [24]. Johnson and Spiro [14] studied 23 patients having a mass in the mid-cheek arising from the accessory parotid gland. Aspiration biopsy was done in 8 patients, yielding the diagnosis in 7. They concluded that FNAB can be useful in selected cases of buccal space masses, however the authors did not routinely employ the use of FNAB in such cases. FNAB does have certain disadvantages, such as possible facial nerve damage, introduction of infection, hemorrhage, tumor spillage, and possible scarring of tissue planes around the facial nerve, which increases the chances of facial nerve paresis during surgical excision. These complications can be minimized by using image guidance for this procedure. However, since FNAB does not alter the management of these lesions, we do not advocate routine FNAB as a routine diagnostic tool in the evaluation of buccal space masses.

Surgical Approaches to the Buccal Space Masses

Several surgical approaches to the buccal space have been described (Fig. 17.5, Table 17.3) [10].

Internal or Intraoral Approach

The approach used most commonly is a direct intraoral, transmucosal incision with dissection and removal of the mass. This approach is appealing because the bulging of the tumor into the intraoral area appears to lend itself to easy excision and of course eliminates a skin incision with its inevitable scar. The transoral approach has several advantages, such as it limiting the area of dissection and hence the potential area of tumor implantation. It is quicker owing to lesser dissections. A transmucosal

Table 17.2. Characteristic radiographic features of buccal space lesions

Tumor type	CT findings	MRI findings
Accessory parotid tissue	• Identified better by CT • Location: separate from main parotid gland, lateral to the masseter along its anterior margin	
Hemangiomas	• Adjacent to buccinator • Phleboliths are characteristic	• Homogenous internal architecture • Higher signal intensity on T2-weighted images • Enhancement with contrast is a typical feature
Vascular malformations:		
• Venous malformations	• Presence of phleboliths	• Discrete areas of high signal intensity representing venous lakes
• Arteriovenous malformations		• Serpiginous flow voids
• Lymphatic malformations	• Smooth, irregular • Adjacent to the buccinator muscle	• Cystic and septated lesions with fluid-fluid levels
Infection and inflammatory lesions	• Inflammatory changes in the fat planes • Abscess appears as a single or multiloculated low-density area with peripheral rim enhancement	• Edema within surrounding fat • Rim enhancement
Tumors of minor salivary gland origin[a]:		
• Benign: pleomorphic adenoma[b]	• Smooth margins	• Rounded appearance • Low signal intensity on T1-weighted images • High signal intensity on T2-weighted images
• Malignant: adenoid cystic carcinoma[c]	• Invasion of surrounding tissue suggests malignant tumor	• Tumors with high signal intensity on T2-weighted images—better prognosis • Tumors with low/intermediate intensity on T2-weighted images—poor prognosis • Invasion of surrounding tissues—poor prognosis
Rhabdomyosarcoma	• Appear as muscle density masses • Show soft tissue and bone infiltration	• Signal intensity is greater that muscle on T2-weighted images • Bone destruction is characteristic

[a] CT/MRIhave limited value in differentiating malignant versus benign tumors—small malignant salivary gland tumors may have a sharp margin mimicking a benign tumor
[b] Pleomorphic adenoma is the most common benign salivary gland tumor
[c] Adenoid cystic carcinomas form 25% of malignant minor salivary gland tumors

Table 17.2. *(continued)* Characteristic radiographic features of buccal space lesions

Tumor type	CT findings	MRI findings
Neurofibroma		• Low intensity signal on T1-weighted images, high intensity on T2-weighted images • Single neurofibroma: target sign—peripheral hyperintensity with central hypointensity
Lipoma	• Internal architecture shows fat density	• T1/T2-weighted signal intensity in high/high
Metastatic lymph node	• Well-circumscribed mass with rim enhancement and central low attenuation	• High signal intensity on T2-weighted images

[a] CT/MRIhave limited value in differentiating malignant versus benign tumors—small malignant salivary gland tumors may have a sharp margin mimicking a benign tumor
[b] Pleomorphic adenoma is the most common benign salivary gland tumor
[c] Adenoid cystic carcinomas form 25% of malignant minor salivary gland tumors

Table 17.3. Surgical approaches to the buccal space

Internal/intraoral approach External approaches:
• Direct approach
• Paranasal approach
• Preauricular approach
• Submandibular approach
• Preauricular-suborbital approach
• Extended parotid-submandibular approach
• Rhytidectomy approach

incision eliminates the complications associated with raising skin flaps, such as flap necrosis. The intraoral approach, however, does not provide adequate exposure to the branches of the facial nerve, which is at greater risk while using this approach, especially since branches of the facial nerve are always closely associated with or actually incorporated into the capsule on the lateral aspect of the tumor, which cannot be visualized well through the intraoral approach. Stensen's duct is also closely associated with these tumors, which increases the risk of injury to the duct and sialocele. Transoral excision may only be suitable for an oral submucosal lesion located medial to the buccinator muscle [10, 25].

External Approaches

The transcutaneous direct external approach has similar advantages to the transoral approach. However, the transcutaneous incision leaves a highly visible scar and the limited exposure makes it difficult to use local tissue to fill any resultant depressed areas [25].

The preauricular approach provides access to superficial tumors that are located posteriorly in the buccal space while the submandibular approach provides access to the lower buccal space. The paranasal approach with its extensions provides excellent exposure but does not permit identification and dissection of the facial nerve. The preauricular-suborbital approach leaves a visible scar along the upper limb of the incision [25].

Essentially most other external approaches described in the literature are suboptimal as they also provide limited exposure for tumor removal or do not allow identification and dissection of the facial nerve.

We have designed the extended parotid-submandibular incision specifically for use in the removal of tumors of the buccal space because it provides excellent exposure and minimizes the risk of complications, such as injury to Stensen's duct or the facial nerve during excision of these tumors [10, 34]. We have found that this technique also provides an excellent cosmetic result. Patients are counseled that the buccal branch of the facial nerve will be dis-

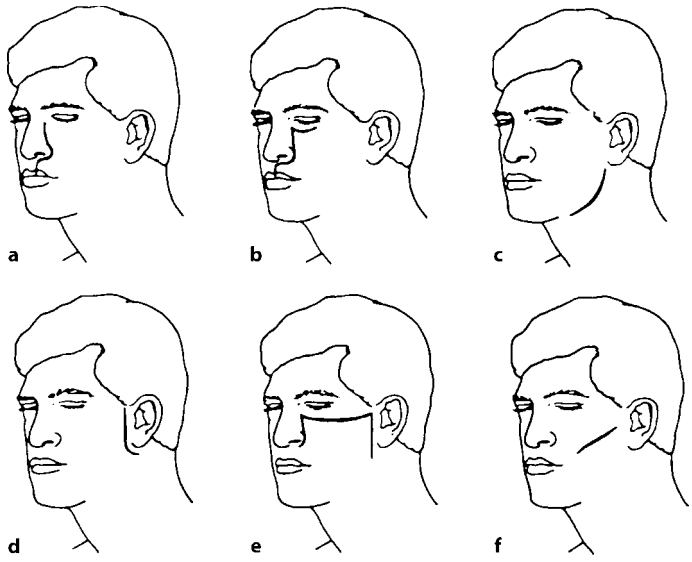

Fig. 17.5: Approaches to the buccal space. **a** Paranasal. **b** Paranasal with suborbital extension. **c** Submandibular. **d** Preauricular. **e** Suborbital-preauricular. **f** Direct cutaneous. [Reprinted with permission from: Rodgers GK and Myers EN (1988) Surgical management of the mass in the buccal space. Laryngoscope 98:749–53]

Fig. 17.6: Extended parotid-submandibular incision. [Reprinted with permission from: Rodgers GK and Myers EN (1988) Surgical management of the mass in the buccal space. Laryngoscope 98:749–53]

sected and elevated off the tumor and is therefore vulnerable to intraoperative injury and postoperative weakness from dissection and stretching of the nerve. The use of intraoperative facial nerve stimulators facilitates the accurate identification of the facial nerve and its branches. The rhytidectomy approach also has advantages similar to the parotid-submandibular approach. The latter leaves a scar in the neck, which normally can be masked in the horizontal skin folds. In our experience, this has proved to be a very effective technique providing excellent masking of the cervical limb of the incision. Though the rhytidectomy incision avoids the neck scar it does not allow access for cervical lymphadenectomy if required [25]. We recommend the extended parotid-submandibular approach and the rhytidectomy approach for management of the buccal space tumors. These two procedures and associated complications are described here.

Extended Parotid-Submandibular Incision

The incision is a modification of the standard parotidectomy incision (Fig. 17.6). Extension of the preauricular incision somewhat superiorly and extension of the cervical incision into a skin crease in the submandibular space allows for wide undermining of the flap, which is necessary in order to gain exposure anterior to the parotid gland to expose the tumor. It is not necessary to carry out a formal parotidectomy or to identify the facial nerve at the stylomastoid foramen because the tumor is located anterior to the anterior border of the parotid gland therefore only the buccal branches of the nerve are anatomically associated with these tumors.

The skin flap is elevated anterior to the anterior border of the parotid gland where the mass begins to be encountered. Further evaluation of the flap provides exposure of the entire mass. The location of the buccal

branches of the facial nerve is easily identified, usually during blunt dissection of the mass, and confirmed with a facial nerve stimulator (Fig. 17.7a–d). Stensen's duct may also be identified during this phase of the dissection. Dissection of the branches of the nerves somewhat anterior and posterior to the mass itself will allow undermining and mobilizing the nerve. A small nerve retractor is then used to retract the branches of the nerve away from the mass. The nerves once dissected may be marked with arterial loops. The mass itself may be made more prominent and easier to dissect by inserting a sponge into the oral cavity adjacent to the buccal mucosa. The mass is then removed by sharp and blunt dissection. After removal of the mass, the nerves are returned to their normal anatomical position. Removal of the tumor leaves a noticeable defect in the facial contour, which is eliminated by approximating the superficial musculoaponeurotic system (SMAS).

Hemostasis is obtained, the wound is irrigated, and a Hemovac drain is inserted under the skin flap and brought

Fig. 17.7: **a** Left cheek mass (frontal view). **b** Left cheek mass (lateral view). **c** Surgical exposure of a buccal space tumor demonstrating the facial nerve branches adherent to the lateral aspect of the mass (*black arrow*). **d** Postoperative picture showing the closure of the standard extended parotid-submandibular incision

out through the skin 1 cm posterior to the incision. The skin flap is closed with subcutaneous chromic sutures and then continuous closure with 6-0 fast absorbing catgut suture. Steri-Strips and a pressure dressing are applied. The patient is allowed to recover from anesthesia. Within 24 h the drainage has usually stopped, the pressure dressing and the drain are removed, and the patient is discharged. The Steri-Strips and sutures are removed within 5–7 days.

Rhytidectomy Approach

Mitz and Peyronie, in 1976, described the rhytidectomy approach and how this technique allows for reconstruction of the contour defect associated with tumor extirpation using the SMAS interposition [29]. The incision employed in these cases is the one used for cosmetic rhytidectomy (Fig. 17.8). The incision begins at the temple and continues in a preauricular crease, and then is posttragal. The incision is carried inferior to the ear lobe and up to the level of the posterior auricularis muscle and posteriorly into the hairline. The skin is undermined anterior to the tumor, mobilized, and retracted away from the tumor. The tumor is then excised as described above. After removal of the tumor, the SMAS is closed directly to give sufficient support to the cheek to avoid deformity. Rotation of a flap of SMAS has been recommended for defects that are too large for direct closure or advancement closure. This technique distributes the volume defect over a wider area and makes the depression of a gradual transition, and therefore less noticeable [25].

Complications

Complications of the extended parotid-submandibular approach are similar to those associated with rhytidectomy and are listed in Table 17.4 [34]. The most common perioperative complication is hematoma occurring with a frequency of 1–15%. This was also the only complication that we had in our series of buccal space tumors. The incidence of large hematomas requiring surgical intervention ranges from 1.9% to 3.6%. Other important complications include injury to the facial nerve and to the parotid gland or the parotid duct which may result in facial asymmetry and parotid pseudocysts (sialocele) or parotid fistulas [30]. Care must be taken in undermining the superior aspect of the flap because the zygomatic branch of the upper division of the facial nerve is superficial in this area and the branch could be injured with resultant facial nerve paralysis.

Fig. 17.8: Standard rhytidectomy incision (*blue line*) and hairline (*dotted line*). [Reprinted with permission from: Lin DT, Coppit GL, Burkey BB, and Netterville JL (2004) Tumors of the accessory lobe of the parotid gland: a 10-year experience. Laryngoscope 114:1652-5]

Complications can be minimized by excellent exposure, meticulous dissection, and identification of important structures, which is exactly why we use the parotid-submandibular approach, which is a systematic surgical approach for the management tumors in the buccal space. The experience of caring for a patient who had a mass previously removed through an incision in the buccal mucosa, sustaining injury to the facial nerve and developing a sialocele in the buccal space due to inadvertent injury to Stensen's duct, was the incentive to design the extended parotid-submandibular incision.

Conclusions

Tumors arising in the buccal space are rare tumors that present in a unique fashion. Clinical examination and

Table 17.4. Complications associated with extended parotid-submandibular approach/rhytidectomy approach

Hematoma
Nerve injury: facial nerve, greater auricular nerve
Necrosis of skin flap
Hair loss
Infection
Parotid injury: salivary fistula, sialocele
Contour deformity
Pigmentary changes in the skin
Keloid/scar formation

radiological correlation provide valuable information regarding the location and extent of these tumors. FNAB may provide additional information in certain cases. However, the only way to characterize these tumors is by excision and pathological evaluation. Surgery is both diagnostic as well as therapeutic in this situation. The parotid-submandibular is a systematic, versatile, and cosmetically acceptable approach that provides excellent exposure to the buccal space and allows identification of the facial nerve branches.

Take Home Messages

- Surgical management and treatment planning through a rigorous evaluation including imaging studies and FNAB. In patients suspected to have a malignant tumor, PET-CT may provide valuable information that could alter the treatment plan.
- Educating the patient regarding postoperative appearance and possible complications is critical. Evaluate the patient's needs as to cosmetic appearance. The modified parotid incision leaves a visible scar so for the female patient a rhytidectomy approach should be considered, whereas the incision in the male patient is usually hidden in the beard line hair and is acceptable.
- Undermine in the plane between the subcutaneous tissue and the SMAS.
- Begin to look for the branches of the buccal branch of the facial nerve once the soft tissues have been undermined to the anterior border of the parotid gland.
- Identify the branches of the facial nerve using the nerve stimulator and dissect them off the tumor.
- Retract the branches of the nerve away from the tumor in order to excise it without nerve injury.
- Closing the SMAS either primarily or with a flap will prevent an unsightly depression in the cheek.

References

1. Allan JH, Finch LD, Chippendale I (1969) Sialolithiasis of the minor salivary glands. Oral Surg Oral Med Oral Pathol 27:780–785
2. Barnard JD (1975) Primary clinical manifestation of bronchial carcinoma as a buccal metastasis. Br Dent J 138:174–176
3. Berger SB, Chaloupka JC, Putman CM, Citardi MJ, Lamb T, Sasaki CL (1996) Hypervascular tumor of the buccal space in an adult as a late recurrence of juvenile angiofibroma. AJNR Am J Neuroradiol 17:1384–1387
4. Calhoun NR (1963) Lipoma of the buccal space. Report of a case. Oral Surg Oral Med Oral Pathol 16:246–249
5. Dunfee BL, Sakai O, Spiegel JH, Pistey R (2005) Solitary fibrous tumor of the buccal space. AJNR Am J Neuroradiol 26:2114–2116
6. Ewbank RL, Mitchell DF (1964) Hyalinized thrombi of the cheek: report of case. J Oral Surg Anesth Hosp Dent Serv 22:456–459
7. Ferreira LM, Hochman B, Locali RF, Rosa-Oliveira LM (2006) A stratigraphic approach to the superficial musculoaponeurotic system and its anatomic correlation with the superficial fascia. Aesthetic Plast Surg 30:549–552
8. Fritz GW, Petti NA, Abitbol A, Thelmo WL (1980) Extranodal malignant histiocytic lymphoma of the cheek: report of case. J Oral Surg, 38(3):200–202
9. Frommer J (1977) The human accessory parotid gland: its incidence, nature, and significance. Oral Surg Oral Med Oral Pathol 43:671–676
10. Gallia L, Rood SR, Myers EN (1981) Management of buccal space masses. Otolaryngol Head Neck Surg 89:221–225
11. Goldberg JA, Georgiade GS (1990) Accessory parotid glands as a site of metastases from outside the head and neck: case report. Head Neck 12:421–425
12. Gomes M, Pepe G, Bomanji J, Al-Salihi O, Du Y, Gacinovic S, Ell P (2006) High-grade mucoepidermoid carcinoma of the accessory parotid gland with distant metastases identified by 18F-FDG PET-CT. Pediatr Blood Cancer
13. Harnesberger HR (1995) The masticator space. In: Harnsberger HR (ed) Handbook of Head and Neck Imaging. Mosby Year Book, St Louis, pp 46–59
14. Johnson FE, Spiro RH (1979) Tumors arising in accessory parotid tissue. Am J Surg 138:576–578
15. Kim HC, Han MH, Moon MH, Kim JH, Kim IO, Chang KH (2005) CT and MR imaging of the buccal space: normal anatomy and abnormalities. Korean J Radiol 6:22–30
16. Kim HS, Lee HK, Weon YC, Kim HJ (2005) Alveolar soft-part sarcoma of the head and neck: clinical and imaging features in five cases. AJNR Am J Neuroradiol 26:1331–1335

17. Klotz DA, Coniglio JU (2000) Prudent management of the mid-cheek mass: revisiting the accessory parotid gland tumor. Laryngoscope 110:1627–1632
18. Kostrubala JG (1945) Potential anatomical spaces in the face. Am J Surg 68:28
19. Kurabayashi T, Ida M, Tetsumura A, Ohbayashi N, Yasumoto M, Sasaki T (2002) MR imaging of benign and malignant lesions in the buccal space. Dentomaxillofac Radiol 31:344–349
20. Kurabayashi T, Ida M, Yoshino N, Sasaki T, Kishi T, Kusama M (1997) Computed tomography in the diagnosis of buccal space masses. Dentomaxillofac Radiol 26:347–353
21. Kwong MD, Bert RJ (1999) Neuroradiology case of the day. Polymorphous low-grade adenocarcinoma of a minor salivary gland in the right buccal space. AJR Am J Roentgenol 173:805, 808–809
22. Landa LE, Kathju S, Nepomuceno-Perez MC, Gordon C, Sotereanos GC (2002) Tuberculous granuloma and adenoid cystic carcinoma presenting as a single buccal space mass. J Craniofac Surg 13:533–537
23. Larsson A, Svartz K (1976) Nodular fascitis in the oral cavity. Int J Oral Surg 5:122–127
24. Lin DT, Coppit GL, Burkey BB, Netterville JL (2004) Tumors of the accessory lobe of the parotid gland: a 10-year experience. Laryngoscope 114:1652–1655
25. Madorsky SJ, Allison GR (1999) Management of buccal space tumors by rhytidectomy approach with superficial musculoaponeurotic system reconstruction. Am J Otolaryngol 20:51–55
26. Maguire CP, Horton CE, Pickrell KL (1955) Tumors of the cheek; observations on etiology, differential diagnosis, and methods of surgical approach. AMA Arch Surg 71:869–906
27. Matarasso A (1997) Pseudoherniation of the buccal fat pad: a new clinical syndrome. Plast Reconstr Surg 100:723–730; discussion 731–736
28. Merchant NE (1972) Cavernous haemangioma of the cheek. Dent Pract Dent Rec 22:436
29. Mitz V, Peyronie M (1976) The superficial musculo-aponeurotic system (SMAS) in the parotid and cheek area. Plast Reconstr Surg 58:80–88
30. Moyer JS, Baker SR (2005) Complications of rhytidectomy. Facial Plast Surg Clin North Am 13:469–478
31. Perzik SL, White IL (1966) Surgical management of preauricular tumors of the accessory parotid apparatus. Am J Surg 112:498–503
32. Polayes IM, Rankow RM (1979) Cysts, masses, and tumors of the accessory parotid gland. Plast Reconstr Surg 64:17–23
33. Robbins JP, Fitz-Hugh GS, Constable WC (1971) Involvement of the buccinator node in facial malignancy. Arch Otolaryngol 94:356–358
34. Rodgers GK, Myers EN (1988) Surgical management of the mass in the buccal space. Laryngoscope 98:749–753
35. Rodriguez V, Bardwil JM, Bodey GP (1971) Primary aspergilloma cured with amphotericin B. South Med J 64:396–398
36. Smith JF (1967) Nodular fasciitis of the buccal pad. Arch Otolaryngol 86:217–218
37. Tate RJ (1971) Unusual facial abscess. Report of a case. Br Dent J 131:504
38. Tomizawa M, Nakajima T, Fukushima M (1979) False aneurysm of the cheek: report of two cases. J Oral Surg 37:515–518
39. Trester PH, Markovitch E, Zambito RF, Stratigos GT (1969) Myositis ossificans, circumscripta and progressiva, with surgical correction of the masseter muscle: report of two cases. J Oral Surg 27:201–205
40. Weaver DF (1964) Tumors of the cheek. Arch Otolaryngol 79:229–238