Facial nerve dissection and formal parotid surgery

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Contents

Principles and justification 467
Pre-operative investigations 468
Imaging 468
Cystotomy 468
Surgical removal of parotid stones 468
Anaesthesia 468
Incision 469
Exposure of the parotid duct 469
Identification of the parotid duct 469
Retrieving the stone 470
Closure 470
Post-operative care 470
Complications 470
Superficial parotidectomy 470
Indications 470
Surgical anatomy 470
Anaesthesia 471
Incision 471
Identifying the trunk of the facial nerve 472
Removal of the superficial lobe 472
Partial superficial parotidectomy 472
Total parotidectomy 473
Closure 473
Post-operative care 474
Complications 474
The superficial SMAS flap 474
Tumour spillage 474
Advanced malignant tumours 475
Extensive deep lobe and other parapharyngeal tumours 476
Transpharyngeal approach to the deep lobe 476
Incision 476
Exposure 476
Closure 477
Complications 477
Suggested readings 478

Principles and justification

The parotid gland is subject to acute ascending bacterial infection from the oral cavity. Provided the infection is controlled with antibiotics, the gland will usually make a complete functional recovery. In a few cases, the gland becomes chronically infected with recurrent acute flare-ups leading ultimately to sialocele and duct changes.
Chronic infection is particularly common when salivary flow rates are reduced, such as in Sjogren’s syndrome or following radiotherapy. In this situation, it is best to remove the superficial lobe of the parotid and to tie off the main duct as far distally as possible. It is not usually necessary to remove the deep lobe, which accounts for only 20% of parotid mass, as this undergoes spontaneous atrophy following superficial lobectomy and duct tie.

Calculi in the parotid duct system are uncommon. The majority impact is at the parotid papilla and is readily released by papillary dilatation with lachrymal probes or fine bougies. Failing this, a papillotomy can be performed under local anaesthesia. Calculi in the intra-glandular part of the duct are usually located at the junction of the main duct and the first-order tributaries, the stone mimicking a staghorn calculus is seen in the renal pelvis (see also Chapter 45).

The majority of salivary tumours (75%) are found in the parotid gland. The overwhelming majority present as slow-growing painless masses within the parotid capsule. Of these tumours, 85% will be benign, mostly pleomorphic salivary adenomas. When skin fixation, ulceration or fungation, facial nerve weakness or lymphatic metastasis is present, and the tumour is clearly malignant. The absence of these signs does not exclude malignancy. The majority of malignant parotid tumours are clinically indistinguishable from benign tumours.

In recent years, there has been a move to more conservative procedures and in particular extracapsular dissection. However, it remains essential that any surgeon dealing with parotid pathology remains competent in the technique of facial nerve dissection and formal parotidectomy. These techniques are required when operating for malignancy, tumour recurrence (benign and malignant) and deep lobe tumours.

### Pre-operative investigations

Routine surgical biopsy is not indicated. The majority of intrinsic parotid masses will be pleomorphic adenomas. These tumours are tense and poorly encapsulated. Rupture, either at the time of biopsy or surgery, leads to widespread spillage of clumps of cells resulting in multiple recurrences which may be very difficult to control. If the tumour remains intrinsic within the parotid at the time of surgery, the exact histological diagnosis is unlikely to influence the definitive surgical procedure. However, if the tumour is obviously malignant and has extended beyond the anatomical boundaries of the parotid, open surgical biopsy is indicated.

Fine needle aspiration biopsy has been widely advocated in the pre-operative diagnosis of parotid masses. Although it is safe, oral pathologists find it difficult to make a definitive diagnosis based on a few aspirated clumps of cells, because the architecture of the tumour is lost, many parotid tumours are heterogenous in appearance and the aspirated sample may not be representative. Furthermore, there is the risk of sampling error although this is reduced when using ultrasound guidance. The newer technique of fine needle core biopsy, particularly when performed using ultrasound guidance, offers hope of more accurate diagnosis.

### Imaging

Conventional sialography is the investigation of choice in chronic inflammatory disease, autoimmune disease and duct obstruction. The post-stimulation emptying film is most valuable as it is a good measure of function and will often determine if surgical excision is indicated.

For the imaging of parotid masses, either computed tomography (CT) scanning or magnetic resonance imaging (MRI) are equally useful. MR imaging avoids the use of ionizing radiation, but CT is better tolerated by patients. Both techniques give a good anatomical image of the region, but can neither reliably demonstrate the plane of the facial nerve nor confidently distinguish intrinsic malignant tumours from benign.

Ultrasound imaging is indicated in acute parotid swellings as it will reliably demonstrate obstruction and collections of pus. In chronic infection, it will show advanced sialo- tasis and duct dilatation. It will also characterize calculi if they are calcified. Warthins tumours are echo poor and show posterior acoustic enhancement whereas pleomorphic adenomas are echogenic.

### Papillotomy

Although readily performed under local anaesthesia, the operation must be performed carefully in order to avoid subsequent stricture formation. A fine metal probe is passed through the papilla into the parotid duct. Using the probe as a guide, one blade of a pair of sharp pointed scissors is inserted into the duct and the wall of the duct is laid open. The cut should be extended posteriorly until the point of the scissors enters the dilated part of the duct proximal to the site of obstruction. A 6-0 resorbable suture is used to sew the cut edge of the duct lining on to the adjacent mucosa of the cheek. This results in the formation of a funnel-like opening of the duct on to the cheek and avoids subsequent stricture formation.

### Surgical removal of parotid stones

### Anaesthesia

The operation is performed under general anaesthesia. The patient is positioned supine with moderate neck extension and the head turned away from the operative side. Head-up tilt on the table helps to prevent venous congestion and ooze. Some anaesthetists are willing to moderately lower
the blood pressure, which reduces arteriolar and capillary bleeding.

The hair in front of the ear is either shaved or gathered into a tuft which can be taped down on to the skin of the cheek. The area is infiltrated with conventional dental local anaesthetic containing 2% lignocaine hydrochloride and 1:80,000 epinephrine (adrenaline). The external auditory meatus is plugged with a small piece of Vaseline-impregnated tulle to prevent blood entering the meatus and irritating the drum. The surface markings of the parotid duct are marked on the skin of the face at the start of the operation and can be readily transposed to the surface of the parotid fascia once the flap has been raised. A line is drawn from the lowest point of the alar cartilage to the angle of the mouth. This line is bisected and the midpoint is joined by a straight line to the most posterior point of the tragus. The line is then divided into three equal parts. The middle section corresponds to the position of the parotid duct (Figure 46.1).

Incision

The incision starts in the hairline running downwards and backwards to the junction of the pinna and the temple. The incision then follows the pre-auricular attachment of the pinna skimming across the free edge of the tragus, following the attachment of the lobe posteriorly and then swinging gently down into a neck crease. Alternatively, the incision behind the attachment of the earlobe may be extended posteriorly into the hairline as with a facelift incision. This variation results in a less visible scar, but surgical access to the parotid region is slightly more difficult. The incision is made either with a No. 15 blade or preferably with a very fine diathermy needle or ceramic blade. The incision is made through the skin just into the underlying fat.

Exposure of the parotid

The flap is raised either using a scalpel or by blunt dissection with scissors over the surface of the investing layer of the deep cervical fascia which in this region splits to encapsulate the parotid (Figure 46.2). In this situation, the dissection can be deep to the superficial musculo-aponeurotic system (SMAS) as this layer will be returned to its anatomical position at the end of the operation. At the superior and anterior margins of the parotid gland, great care must be taken not to damage branches of the facial nerve which in these areas become very superficial. The flap must be raised just beyond the anterior border of the parotid. The flap is held forwards by suturing the flap to the head drapes with mattress sutures.

Identification of the parotid duct

The duct is identified where it emerges from the anterior border of the parotid. The surface marking of the duct is transferred on to the fascia. The fascia is incised along the line of the duct and, by careful blunt dissection, a search is made for the duct which is pinkish grey and covered with a fine capillary network. The branch of the facial nerve supplying the upper lip runs parallel with the duct either on its surface or a few millimetres superior to the duct. If the duct is not readily identifiable, it is useful to pass a fine IV cannula through the parotid papilla into the duct. This splints the duct and it can be easily palpated within the parotid (Figure 46.3).
Retrieving the stone

Once the duct has been identified at the anterior border of the parotid gland, it is fairly simple and rapid to follow it back into the substance of the gland. With fine scissors, the tissues overlying the duct are progressively separated and divided. Stay sutures through the edges of the dissection are used to retract the parotid. Provided the dissection continues in the plane immediately above the duct and the branch of the facial nerve to the upper lip is kept in sight, there is no risk to other branches which at this point have fanned out. Several fine intercommunicating branches will be encountered crossing the surface of the duct. Tributaries of the posterior facial vein are carefully clamped, divided and tied.

Once the calculus has been reached, it can be palpated through the duct wall. A longitudinal incision is made in the duct wall and the calculus is carefully teased out of the duct (Figure 46.4). The duct is then carefully irrigated proximally and distally with sterile saline or water to flush out any associated ‘gravel’ which if retained acts as a focus for recurrent stone formation (Figure 46.5).

Closure

No attempt should be made to suture the duct wall as this results in stenosis. The stay sutures are removed and the parotid capsule closed with resorbable sutures. A small vacuum drain is inserted under the skin flap to avoid hematoma formation and the flap is closed in two layers.

Post-operative care

As the parotid gland is likely to be infected proximal to the site of the calculus, antibiotics are administered for 3 days post-operatively. The drain is removed at about 24 hours and the skin sutures are removed after 5 days.

Complications

Apart from anaesthesia in the territory of the skin flap, there are few complications. As the fascia forming the capsule of the parotid gland is closed, salivary fistula and Frey’s syndrome do not occur. The paraesthesia gradually resolves as the cutaneous sensory fibres regenerate from the periphery. If a face-lift incision has been utilized, healing is normally excellent and after 6 months the scar becomes almost invisible. However, if a conventional lazy-S incision has been used, hypertrophic scarring sometimes occurs in the cervical extension of the incision. For this reason, patients should be followed up carefully for the first 6 months so that, if hypertrophic changes are seen, the scar can be treated appropriately. Weekly infiltration with triamcinalone acetonide will usually prevent further scarring.

Superficial parotidectomy

Indications

Treatment of parotid tumours is classically by superficial lobectomy for all tumours within the superficial lobe and total parotidectomy for all tumours within the deep lobe. Such deep lobe tumours should never be approached from the pharyngeal aspect even when they present as lateral pharyngeal masses. The facial nerve, if not macroscopically invaded by malignant tumour, is preserved in all cases. For small tumours arising in the superficial lobe, careful extracapsular dissection may be undertaken (see Chapter 45).

Surgical anatomy

The key to successful parotid surgery is the observation of the two following anatomical features (Figure 46.6):

1. The parotid gland has two lobes (superficial and deep) united by an isthmus. The parotid gland is not embryologically a bilobed structure, but its developmental relationship to the facial nerve results in the two surgical lobes
2. The facial nerve and its branches are surrounded by these lobes, invested in loose connective tissue. The facial nerve, except when invaded by tumour, does not enter the substance of the gland.
The following are four anatomical landmarks leading to the identification of the trunk of the facial nerve as it leaves the stylomastoid foramen (Figure 46.7):

1. The cartilaginous external auditory meatus forms a ‘pointer’ its anterior inferior border indicating the direction of the nerve trunk.
2. Just deep to the cartilaginous pointer is a reliable bony landmark formed by the curve of the bony external meatus and its abutment with the mastoid process. This forms a palpable groove leading directly to the stylomastoid foramen. Unfortunately, this groove is filled with fibrofatty lobules that often mimic the trunk of the facial nerve, which can lie as much as 1 cm deep to this landmark.
3. The anterior superior aspect of the posterior belly of the digastric muscle is inserted just behind the stylomastoid foramen.
4. The styloid process itself can be palpated superficial to the stylomastoid foramen and just superior to it. The nerve is always lateral to this plane and passes obliquely across the styloid process. A branch of the post-auricular artery is usually encountered just lateral to the nerve.

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**Anaesthesia**

The operation is performed under general anaesthesia. The patient is placed supine with a sand bag or pad under the shoulder on the side of the operation. The neck is moderately extended and the head is turned to the opposite side. The table is tilted to reduce venous engorgement. The anaesthetist should be requested to drop the blood pressure to reduce capillary and artereolar bleeding. The incision line is infiltrated with lignocaine hydrochloride and 1:80,000 epinephrine (adrenaline).

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**Incision**

The incision starts in the temporal region and passes inferiorly in the pre-auricular crease, crossing the base of the tragus and passing posteriorly behind the lobe of the ear. It then either extends posteriorly into the hairline as in a face lift or alternatively swings down inferiorly from the mastoid to continue in a neck crease. The incision may be made either with a No. 15 blade or with fine needle diathermy or a ceramic blade. The skin flap may be raised in the plane of the pre-parotid fascia, but if it is raised superficial to the SMAS, this layer can be mobilized as a separate exercise and used to cover the raw surface of the parotid avoiding much of the cosmetic deformity and the incidence of Frey’s syndrome. The flap is held forward by suturing the margins of the flap to the adjacent head drapes (Figure 46.8).

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![Figure 46.6](image_url) Development of the parotid gland to engulf the branches of the facial nerve.

![Figure 46.7](image_url) Anatomical landmarks leading to the identification of the facial nerve trunk. 1 cartilagenous external meatus; 2 parotid gland; 3 sternocleidomastoid muscle; 4 tip of the mastoid process; 5 styloid process; 6 posterior belly of digastric muscle.

![Figure 46.8](image_url) Flap elevated to expose the superficial lobe of the parotid gland.
**Identifying the trunk of the facial nerve**

The routine use of a nerve stimulator as a guide to the position of the facial nerve is not advocated as it may be misleading due to tissue conduction or fatigue of the nerve. The blood-free plane anterior to the cartilaginous meatus is opened up by blunt dissection with scissors. This leads down to the base of the skull just superficial to the styloid process and the stylomastoid foramen and defines the depth of the dissection. This plane is then gently opened up in an inferior direction by blunt dissection until the trunk of the facial nerve is seen. It is usually possible to preserve the posterior branch of the great auricular nerve if care is taken to avoid dissecting too deep to the earlobe.

With large posterior tumours, this plane may be difficult to open up. In this situation, it is helpful to identify the posterior belly of the digastric muscle in the cervical extension of the incision. The anterior border of the sternocleidomastoid muscle is mobilized and retracted inferiorly to display the digastric muscle beneath it. This manoeuvre necessitates sectioning the great auricular nerve. The posterior belly of the digastric muscle is traced upwards and backwards to its insertion on to the mastoid process which lies immediately below the stylomastoid foramen, thus leading the operator to the facial nerve from below (Figure 46.9a and b).

Very rarely, most often after recurrent infection with fibrosis or previous radiotherapy, the trunk of the facial nerve cannot be confidently identified. In this situation, the peripheral branches of the nerve at the anterior border of the parotid are identified and traced centrally towards the stylomastoid foramen.

**Removal of the superficial lobe**

Once the facial nerve trunk has been identified, the superficial lobe of the parotid can be ‘exteriorized’ by opening up the plane in which the branches of the facial nerve run between the two lobes using blunt dissection. Initially, as it leaves the stylohyoid foramen, the trunk of the facial nerve turns abruptly to become more superficial and also divides into the larger zygomaticofacial trunk and smaller cervicofacial trunk. The five main branches of the nerve are then followed centrifugally through the parotid until the superficial lobe is completely freed. This part of the operation is performed using fine scissors, opened up in the plane of the facial nerve branches, with care always taken to identify the nerve fibre before dividing parotid tissue (Figure 46.10a and b). During the lower part of the dissection, branches of the posterior facial vein will be encountered immediately deep to the marginal mandibular branch of the facial nerve. Great care must be taken when vascular clamps are applied to these branches to avoid damaging the facial nerve. If the superficial parotidectomy is being performed for chronic infection, the duct should be tied off as far forward as possible to prevent recurrent ascending infection.

**Partial superficial parotidectomy**

When the tumour lies within the tail of the parotid gland, there is no necessity to dissect all the branches of the facial nerve nor to remove the entire superficial lobe. Once the main division of the nerve trunk has been identified, only the cervicofacial trunk needs to be followed and the inferior part of the superficial lobe is mobilized and ultimately removed. Similarly, if the tumour lies above the level of the meatus, only the zygomaticofacial trunk should be dissected and the corresponding part of the superficial lobe is removed.
If the tumour lies in the deep lobe of the gland, a conventional superficial parotidectomy is performed as described. Next, the branches of the facial nerve are mobilized and lifted on nylon tapes to enable the deep lobe to be freed around its margins and removed by dropping it downwards (Figure 46.11). As this space is wedge-shaped with its apex superior, it is almost invariably possible to do this. The deep lobe is covered by a capsule (the deep layer of the deep cervical fascia which splits to envelope the parotid) and is surrounded by the parapharyngeal fat. Thus, it is relatively easy to mobilize the deep lobe by blunt dissection either with scissors or with a finger (Figure 46.12). Only very rarely it is necessary to perform a mandibulotomy (either vertical sub-sigmoid or angle) to gain access to the deep lobe.

**Figure 46.11** Mobilization of the branches of the facial nerve to gain access to the deep lobe.

**Figure 46.12** Mobilization of the deep lobe of the parotid gland.

**Figure 46.13** Two-layer closure with a single vacuum drain prior to the application of a pressure dressing.

**Total parotidectomy**

If the tumour lies in the deep lobe of the gland, a conventional superficial parotidectomy is performed as described. Next, the branches of the facial nerve are mobilized and lifted on nylon tapes to enable the deep lobe to be freed around its margins and removed by dropping it downwards (Figure 46.11). As this space is wedge-shaped with its apex superior, it is almost invariably possible to do this. The deep lobe is covered by a capsule (the deep layer of the deep cervical fascia which splits to envelope the parotid) and is surrounded by the parapharyngeal fat. Thus, it is relatively easy to mobilize the deep lobe by blunt dissection either with scissors or with a finger (Figure 46.12). Only very rarely it is necessary to perform a mandibulotomy (either vertical sub-sigmoid or angle) to gain access to the deep lobe.

**Closure**

Following the removal of the parotid, the blood pressure is returned to normal and the head-up tilt returned to horizontal. All bleeding points must be meticulously controlled. A vacuum drain is inserted under the flap and the wound carefully closed in two layers (Figure 46.13).
A firm pressure dressing will help to prevent any collection of blood or saliva under the flap.

**Post-operative care**

The pressure dressing, if used, is removed at about 12 hours and the vacuum drain at 24 hours if the wound is no longer draining. Skin sutures are removed after 5 days.

**Complications**

Permanent facial nerve paralysis following superficial or total parotidectomy is very rare, except when branches of the facial nerve have been deliberately sacrificed. When the facial nerve or its branches are sacrificed as a result of macroscopic tumour involvement, an immediate nerve graft may be undertaken using conventional microneural techniques. Temporary weakness due to neuropaia occurs in approximately 20% of operations, but recovers usually within 6 weeks.

Anaesthesia of the skin flap slowly resolves as the sensory nerves regenerate from the periphery over a 4-month period. Anaesthesia of the earlobe due to sectioning of the great auricular nerve can develop on the stump of the sectioned nerve and requires excision.

Frey’s syndrome (gustatory sweating) is a regular sequel to parotidectomy occurring in more than half the patients if looked for carefully. The only effective way to control the symptoms if troublesome is to map out the area of sweating and then infiltrate the subcutaneous plane with botulinum toxin. This will need to be repeated at intervals of 4–6 months.

Other rare complications, such as sialocoele or salivary fistula, occasionally follow parotidectomy. Both complications are managed conservatively and resolve spontaneously after days or weeks. Very rarely, a parotid fistula persists despite attempts at surgical closure. In this situation, post-operative radiotherapy will destroy any residual functioning glandular tissue and allow the fistula to close.

Parotidectomy can result in a significant cosmetic defect with hollowing of the facial contour behind the mandible. Where this is likely to be a problem, the superficial part of the sternocleidomastoid muscle can be mobilized, transacted inferiorly and swung up to cover the defect (Figure 46.14). The flap must be anchored in place with non-absorbable sutures as it tends to pull down into the neck.

**The superficial SMAS flap**

The superficial SMAS can be elevated as a separate flap if the skin flap is raised in the subcutaneous layer (Figure 46.15a). On completion of the parotidectomy, the SMAS layer can be mobilized to cover the defect behind the mandible by suturing its free edge posteriorly to the anterior border of the sternocleidomastoid muscle and periosteum of the zygomatic buttress (Figure 46.15b). This will also partially advance the skin flap and excess tissue may need to be trimmed. Great care must be taken when a tumour lies very superficially within the parotid. Mobilizing the SMAS flap can very easily rupture the tumour capsule and it is better to buttonhole the flap overlying the tumour rather than risk rupture. The evidence suggests that not only does the use of the SMAS flap improve the cosmetic result, but it also dramatically reduces the incidence of Frey’s syndrome.

**Tumour spillage**

Spillage of a benign pleomorphic adenoma should not occur if a formal parotidectomy is undertaken. However, the following are four circumstances where even with meticulous surgical technique this can happen:

1. Extremely large pleomorphic adenomas occupying the entire superficial lobe making mobilization of the gland difficult. In this circumstance, it may be better to dissect the facial nerve from the periphery.
2. Tumours that are intimately associated with branches of the facial nerve requiring very delicate dissection along the capsule of the tumour to release the nerve.
3. Tumours with lobular extensions extending beneath the mastoid, zygomatic arch or mandible.
4. Some tumours that are abnormally friable with even routine retraction of the superficial lobe resulting in rupture.

If rupture does occur, an extremely careful inspection of the wound must be undertaken and the area thoroughly...
irrigated. The circumstances should be discussed subsequently at the head and neck cancer multidisciplinary team (MDT) meeting for consideration of prophylactic post-operative radiotherapy to prevent multiple recurrences due to tumour seeding.

**Advanced malignant tumours**

In a small proportion of cases, the subsequent histopathological diagnosis will be of malignancy. Provided the tumour was intrinsic to the parotid and the tumour was not ruptured during parotidectomy, no other surgery is necessary or desirable. Each case should be discussed at the MDT meeting and considered for post-operative radiotherapy. In general, all high-grade tumours should be treated with radiotherapy and also those where there is any doubt about the margins being clear.

Patients with advanced disease with extension beyond the parotid capsule into adjacent tissues or with lymphatic metastasis should be treated by a sound oncologic technique according to the specific circumstances (Figure 46.16a and b). Often this will include mandibular resection, clearance of the infratemporal fossa and neck dissection and on occasion resection of the temporal bone (Figure 46.17a and b). If any of the branches of the facial nerve are functioning pre-operatively, they may be preserved as

**Figure 46.15** (a) Area of undermined superficial musculoaponeurotic system (SMAS) flap. The ‘hinge’ is indicated by the dotted line. (b) Re-attachment of the SMAS flap to the zygomatic buttress and sternocleidomastoid muscle.

**Figure 46.16** (a) Malignant parotid tumour with cervical metastasis. (b) Total parotidectomy and neck dissection with preservation of the facial nerve.
evidence suggests that radical sacrifice of the facial nerve does not improve survival.

**Extensive deep lobe and other parapharyngeal tumours**

On occasion, very extensive deep lobe parotid tumours develop with minimal signs and symptoms. In such circumstances, a transpharyngeal approach using a lower lip split and mandibulotomy with mandibular swing will give adequate access to the deep lobe and infratemporal fossa.

**Transpharyngeal approach to the deep lobe**

Although this approach is mostly used for large extraparotid masses, it is occasionally indicated for the exceptional tumour arising in the deep lobe (Figure 46.18). After anaesthetic induction, an elective tracheostomy is performed as there can be considerable swelling in the oropharynx post-operatively.

**Incision**

A skin crease incision is made from the level of the hyoid bone and extended forward towards the chin point. At this point, the incision is continued either around the chin point or vertically in the midline. The decision is dictated according to the local anatomy. In patients with a pronounced chin cleft, it is best to use a midline vertical incision and for those with a well-developed chin button dictate it is preferable to incise around this (Figure 46.19). The lower lip is split in the midline, but a notch should be incorporated in the incision line at the vermilion border. These help with the aligning of the vermilion border at skin closure and also acts as a Z-plasty to prevent tethering of the lower lip.

**Exposure**

After retraction of the sternocleidomastoid muscle posteriorly, the carotid sheath is isolated and traced upwards to the skull base. Vascular slings are placed around the internal and external carotid arteries in case either vessel

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**Figure 46.17** (a) Recurrent high-grade mucoepidermoid carcinoma causing intractable pain. (b) Radical tumour resection including the mandibular ramus and temporal bone.

**Figure 46.18** Computed tomography scan showing an extensive deep lobe tumour requiring a transpharyngeal approach.
is ruptured later in the operation and urgent control is required. Often it is sensible to clamp, divide and ligate the external carotid at this stage.

The dissection is then continued forward deep to the submandibular salivary gland. It must be carefully freed from the underlying hyoglossus and mylohyoid muscles, whilst remaining attached to the lower border of the mandible.

The surgeon should then return to the chin incision and expose the buccal aspect of the mandible from the midline back to the premolar region carefully isolating the mental nerve as it exits the foramen between the premolar roots.

The mandibulotomy is then marked running between the first premolar and canine teeth (Figure 46.20). Two microplates are then adapted to the buccal aspect of the mandible and the screw holes drilled. The plates are then carefully put aside, care being taken to mark them for position and orientation.

The mandibulotomy cut is then made with a reciprocating saw. Great care must be taken between the two adjacent teeth so as not to damage the roots. It may be wise to cut just through the buccal cortex with a bur and continue the mandibulotomy with a very fine osteotome at this level. The mandible is then retracted laterally and the mucosal incision extended posteriorly along the floor of the mouth medial to the submandibular duct. The incision should extend up the anterior pillar of the fauces to the upper pole of the tonsil.

During this stage of the operation, the lingual nerve and the hypoglossal nerve must be identified. The hypoglossal nerve can be readily displaced medially and protected, but it may be difficult to release the lingual nerve sufficiently. In this case, the nerve should be cleanly divided with a blade and the ends tagged, so that an anastomosis can be performed at the end of the operation.

At this stage of the operation, the parapharyngeal space can be opened through the incision and the tumour mobilized and delivered by blunt dissection.

**Closure**

Following meticulous haemostasis, a vacuum drain is inserted into the parapharyngeal space. The intra-oral incision is closed in at least two layers with the mucosa being closed with everting mattress sutures as it is important to achieve a watertight closure to prevent the formation of an orocutaneous fistula. At this stage, the lingual nerve should be repaired with micro neural techniques if it has been previously divided. Once the floor of the mouth has been repaired, the previously adapted microplates are screwed into their previously drilled holes and mandibular continuity is restored without any disturbance to the occlusion.

The skin incision is closed in two layers. Great care must be taken with the lip closure. The orbicularis muscle should be repaired with resorbable sutures before commencing a two-layered closure of the skin. It is very important to achieve perfect alignment of the vermillion as failure to achieve this result in a very unsightly scar. The skin sutures are removed usually at 24 hours and the skin sutures at 7 days.

**Complications**

The greatest risk with this operation is the development of an orocutaneous fistula. Watertight closure of the mucosal incision is vital. Should a fistula develop, it is worth returning the patient to the operating theatre and resutting the mucosa where it is leaking. If this is done, the drainage through the neck will close spontaneously.

Damage to the teeth adjacent to the mandibulotomy can be prevented by careful technique at the time of the operation. The lingual nerve repair will normally give useful function, but sensation almost never returns completely. The patient should have been warned of this pre-operatively.
Top tips

- Surgical biopsy of an intrinsic parotid tumour carries a severe risk of seeding tumour cells into the adjacent tissues and rarely affects the definitive surgical procedure.
- Although embryologically composed of a single lobe, the parotid gland consists of two surgical lobes separated by the facial nerve which is enclosed in loose connective tissue.
- The trunk of the facial nerve is very constant anatomically. It should be identified before any facial nerve dissection, except when a centripetal approach is to be used. The anatomical landmarks are 100% reliable.
- The great majority of deep lobe tumours may be safely removed without dividing the mandible.
- Preserving the SMAS and re-attaching it at the end of a parotidectomy improve the cosmesis and dramatically reduce the incidence of Frey’s syndrome.
- The only reliable way of controlling Frey’s syndrome is the subcutaneous infiltration of botulinum toxin into the affected area.

Suggested readings