Surgical Treatment of a Giant Lipoma in the Parotid Gland

Sung-No Jung, MD

Abstract: Recently, a case of deep-lobe lipoma with enucleation was reported, but frozen-section biopsy for the confirmation of the malignancy was not done. It has been suggested that lipoma in the deeper tissues should be regarded as a well-differentiated liposarcoma and be treated with wide excision. Our experience is that of a 75-year-old woman who had a mass with fat density in the deep lobe of the right parotid gland, which extended through the parapharyngeal and the buccal spaces. Lymphangiography with frozen-section biopsy was performed, not only preserving branches of facial nerve but also ruling out the malignancy. Frozen-section biopsy showed a lipomatous lesion without malignancy, so further treatment such as total parotidectomy was not needed.

Key Words: Lipoma, parotid gland, deep lobe, lumpectomy

Lipomas are rarely found in the parotid gland. Among parotid tumors, the incidence of lipoma ranged from 0.6% to 4.4%. Because of their rarity, they are not often considered in the differential diagnosis of parotid tumors, and surgical management of lipomas in the parotid gland is controversial. Most authors suggest a formal superficial parotidectomy with full exposure of the facial nerve and its branches for deep parotid lobe lipomas. Enucleation or excision of the well-encapsulated tumor with a rim of parotid gland tissue is another surgical approach, and advocated for paraparotid or intraparotid lipomas. Regardless of its safeness and efficacy, total excision of deep-lobe lipomas by enucleation has not been done routinely because lipomas seated deep into the head and neck regions should be regarded as well-differentiated liposarcomas. We suggest intraoperative frozen-section biopsy to be considered in the selection of the surgical approach of this tumor.

PATIENT

A 75-year-old woman with a 3-year history of a swelling in front of her right ear was referred to our department. The swelling had grown slowly and had caused no other symptoms. Physical examination revealed an 8 × 8-cm-sized soft tender mass in the right parotid gland. There were no associated lymph nodes, and no facial palsy was observed. Computed tomography (CT) showed a fat density–lobulated mass involving the deep lobe of the right parotid gland, with extension into the parapharyngeal and the buccal spaces.

FIGURE 1. Computed tomographic scan showing a fat density–lobulated mass involving the deep lobe of the right parotid gland, with extension into the parapharyngeal and the buccal spaces.

DISCUSSION

Lipoma in the parotid gland can be difficult to diagnose clinically, but high-resolution CT or magnetic resonance (MR) imaging and ultrasonography can aid the diagnosis and the extension of the tumor. Lipoma can be diagnosed by CT scan, which shows a homogeneous and well-capsulated hypodense (50–150 IU) mass in contrast to the hyperdense normal parotid tissue.

Liposarcoma can be suspected if there is a heterogeneous density due to the intralobular hemorrhage and necrosis, irregular margin, and extension into the surrounding tissue. This tumor produced strong signals on T1- and T2-weighted MR images and weak signals on fat suppression images. In addition, MR imaging clearly showed the margin of the tumor that is expressed by a black halo, which enabled us to readily distinguish the tumor from the surrounding adipose tissue.

Neither intraoperative gross findings nor diagnostic imaging can rule out liposarcoma; hence, pathologic examination is necessary.
Several distinct microscopic variants of lipomas, for example, angiolipoma, fibrolipoma, pleomorphic adenoma, sialolipoma, fibrolipoma, spindle cell lipoma, and lipomatosis, have been reported.

Surgical management of the tumor is dependent on the location. Enucleation and superficial parotidectomy are usually done when the tumor involves the superficial lobe. Superficial and total parotidectomies are done when the tumor involves the deep lobe because of its high recurrence rate and the possibility of a liposarcoma. However, facial nerve dysfunction and the Frey syndrome may be encountered after surgery in case of a deep-lobe parotid lipoma. Recently, a case of a deep-lobe lipoma with enucleation was reported, but the frozen-section biopsy for the confirmation of the malignancy was not done.

It has been suggested that lipoma in the deeper tissues should be regarded as a well-differentiated liposarcoma and be treated with wide excision. In histologic sections, the presence of nuclear pleomorphism and multinuclear giant cells differentiated these lesions from benign lipomas.

We enucleated the giant lipoma of the deep lobe with preservation of the parotid gland and did intraoperative frozen-section biopsy to rule out the liposarcoma. It is suggested that the lipoma can be enucleated when the preoperative radiologic findings and the intraoperative finding that has a clear margin are benign; frozen-section biopsy was done intraoperatively to rule out malignancy.

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Paradoxical Vocal Cord Motion–Haloperidol Usage in Acute Attack Treatment

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Abstract: Paradoxical vocal cord motion (PVCM) is an uncommon disease characterized by vocal cord adduction during inspiration and/or expiration. It can create shortness of breath, wheezing, respiratory stridor, or breathy dysphonia. Possible etiological factors include asthma, underlying psychologic condition, gastroesophageal reflux disease, respiratory irritants exposure, central neurologic diseases, viral upper airway infections, and postsurgical procedures. Many treatment modalities were performed for acute attack of PVCM, including reassurance and onsite maneuvers, benzodiazepines, heliox, and so forth. We report a patient with PVCM who had stridor and dyspnea for 10 days and responded to intravenous haloperidol treatment.

Key Words: Paradoxical vocal cord motion, haloperidol, antipsychotics

Paradoxical vocal cord motion (PVCM) is a rare disease that is characterized by vocal cord adduction during inspiration and/or expiration. The possible causes include asthma, psychologic condition, gastroesophageal reflux disease, respiratory irritants exposure, central neurologic diseases, upper respiratory infections, and postsurgical procedures. Many treatment modalities were performed for acute attack of PVCM, including reassurance and onsite maneuvers, benzodiazepines, heliox, and so forth. We report a patient with PVCM who had stridor and dyspnea for 10 days and responded to intravenous haloperidol treatment.

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expiration. It was first described by Dunglison and was named as “hysterical croup” in 1842. The initial presentation may include shortness of breath, wheezing, respiratory stridor, or breathy dysphonia. Paradoxical vocal cord motion may be expedited by exercise and emotional mood, and it is usually misdiagnosed and mistreated as asthma. It affects mainly children and young adults with lower ages. It has a reported 2:1 female predominance.

In its long-term treatment, speech therapy, psychologic counseling, or other modalities may be used to avoid reattack. There are many treatment modalities for acute attack of PVCM, including reassurance and onsite maneuvers, benzodiazepines, heliox (gaseous mixture of oxygen and helium), and nebulized lignocaine.

In this article, we report an 18-year-old man with PVCM who had stridor and dyspnea for 10 days and responded to intravenous (IV) haloperidol treatment.

**CLINICAL REPORT**

An 18-year-old man was referred to our department with a 10-day history of stridor, dyspnea, shortness of breath, and hoarseness. These complaints disappeared while he spoke. The patient had been treated for asthma for the last 5 years in the Chest Diseases Department of our faculty, and he had experienced similar episodes. During his last attack, he was treated for asthma, as with previous episodes. Unlike the previous episodes, however, he did not respond to inhaled corticosteroids and bronchodilators and oxygen therapy in the current episode. Therefore, he was referred to our department to evaluate whether upper airway obstruction caused his condition.

Indirect laryngoscopy was performed, and persistent PVCM, with abduction in expiration and adduction in inspiration, was observed (Figs. 1 and 2). His chest radiograph result was normal. The arterial blood gas analysis showed mild acute respiratory alkalosis (pH 7.49; PO₂, 22.1 mm Hg, PO₂, 127 mm Hg). We investigated all possible etiological factors that can cause PVCM. He had no history of gastroesophageal acid reflux disease, extubation after any surgical procedure, or exposure to any respiratory tract irritants. He had no upper airway viral infection; his cranial magnetic resonance imaging result was completely normal, and no central neurologic diseases were found.

Inhaled corticosteroids and bronchodilators and oxygen therapy were started, but he did not respond to this treatment. We used 0.5 mg of diazepam IV to sedate him and relieve his anxiety because we observed that his dyspnea disappeared during deep sleep. Despite these treatments, his condition did not improve. Accordingly, continuous positive airway pressure (CPAP) was administered at the Chest Diseases Department. Although CPAP treatment reduced the patient’s complaints, he could not tolerate CPAP because of a severe headache and neck pain; thus, the CPAP was discontinued.

No specific condition was identified during a psychiatric consultation, such as depression or hysteria. Despite the absence of a specific psychiatric disease, the patient was considered to have a possible conversion disorder and the Psychiatry Department administered the antipsychotic haloperidol 10 mg IV to relieve his symptoms. He responded to this drug dramatically, and his complaints, including the stridor, dyspnea, and shortness of breath, were rapidly relieved. Unfortunately, we could not use this drug for long-term treatment because the patient did not tolerate the adverse effects of haloperidol, such as uneasiness, dizziness, and dystonic reactions.

Because we had no alternative medical therapy for the PVCM, we planned surgical treatment to relieve his symptoms. First, a percutaneous transcricothyroid botulinum toxin type A injection was performed under general anesthesia, but the patient showed no improvement after injection. While we were planning a second surgical procedure, the patient’s complaints increased gradually, which necessitated a tracheotomy under general anesthesia to secure his airway and reduce the dyspnea and stridor. After the tracheotomy, his dyspnea and stridor disappeared, although they would reappear while he was breathing and disappear when he spoke using the valve speaking tracheotomy tube.

The patient refused all other surgical treatments for his condition. We observed the patient for 6 months, and his condition did not improve.
DISCUSSION

Paradoxical vocal cord motion is an uncommon disease characterized by an inappropriate adduction of the vocal cords during inspiration. It is most commonly seen in women between 20 and 45 years. The etiology of PVCM is still authenticated. There are many possible etiological factors, including asthma, underlying psychologic condition, gastroesophageal acid reflux disease, respiratory irritants, exposure to central neurologic diseases, viral upper airway infections, and post-surgical procedures. Four pathogenic mechanisms have been suggested to underlie PVCM: laryngeal hyperresponsiveness, altered autonomic balance, direct stimulation of the sensory nerve endings in the upper or lower respiratory tract, and hyperventilation.

The diagnosis of PVCM can be established by indirect fiber-optic laryngoscopy during acute attack. The criterion standard for diagnosis is the direct visualization of the vocal cords when the symptoms appeared and a small posterior diamond-shaped glottal chink is diagnostic. Many methods can be used for treating PVCM, including reanastomosis and on-site maneuvers, benzodiazepines, heliox (gaseous mixture of oxygen and helium), nebulized lignocaine, inhaled corticosteroids and bronchodilators, and oxygen for symptomatic improvement. In addition, speech therapy, psychotherapy, hypnotic, and biofeedback are useful treatments of PVCM. Suture lateralization of the vocal cords and botulinum toxin type A injection are alternative surgical treatment methods.

Although many methods can be used for treating PVCM, we could find no report of antipsychotic drug usage, such as haloperidol, in the literature. Interestingly, our patient’s symptoms were relieved on administering haloperidol. A comprehensive review of haloperidol has found it to be an effective agent for treating symptoms associated with schizophrenia. We believe that haloperidol can be an alternative treatment method during an acute PVCM attack, when no other organic pathologic is found, such as gastroesophageal reflux disease, exposure to respiratory irritants, central neurologic diseases, or viral upper airway infections.

CONCLUSIONS

Further studies should explore the pathogenesis, etiology, and treatment of PVCM, and we suggest that haloperidol may be an alternative therapy for an acute attack of PVCM.

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smooth border, and an inhomogeneous aspect. The capsule could be detected in many cases on magnetic resonance images, whereas on computed tomographic images, it is rarely observed.

The therapeutic approach for the PA is exclusively surgical, and owing to the development of possible ramifications, conservative parotidectomy in parotid PA and excision with security margins in case of extraparotid PA are indicated to avoid risk of relapse. Elective localization of PA is observed in the parotid gland with more than 90% of all the cases, whereas the remaining are extraparotid PA, which, more often, were found to occur in the minor salivary glands of the palate with a rate of 2.7% of the whole PA cases and in the minor salivary glands of the lips in a rate of 1% of all PA cases.

The finding of a PA in the minor salivary glands of the cheek was described only in 2 cases during the last 24 years and represented an exceptional finding. The aim of this article was to illustrate a case of extraparotid PA developing at the salivary glands of cheek, a short distance from Stensen duct, and to report surgical strategy.

**CLINICAL REPORT**

On January 2007, at the Maxillo-Facial Surgery ambulatory, Sant’Andrea Hospital II, Faculty of Medicine and Surgery, “La Sapienza” University of Rome, a white woman aged 21 years was presented, complaining an indolent swelling at the right cheek, which started 7 months before. Since its appearance, no enlargement was noticed by patient.

Clinical examination revealed an asymmetry of the face caused by the presence of an enlargement at the right cheek. Intraoral evaluation of the right cheek found a swelling covered by the normal mucosa, having an approximate diameter of 2 cm. The mass was delimited by the Stensen salivary duct and masseter muscle and posteriorly by the upper fornix and lower fornix. Palpation found a mass of hard consistency, mobile from surrounding planes. Clinical maneuvers did not elicit pain.

Ultrasound examination was performed a few days later and referred a homogeneous hypoechic round solid mass with a well-defined lobulated margin. Surgical treatment was carried out on January 2007. After the Stensen duct was canalized, an intraoral incision of the overlying mucosa was made. Smooth dissection was gently carried out to expose the mass and the margin of masseter muscle. The surrounding vascular structure along with the Stensen duct was safely preserved. The neof ormation, along with its well-defined capsule, was excised (Fig. 1) and sent for definitive histologic examination. At the end of the surgical treatment, the catheter was removed from the salivary duct, and the integrity of the Stensen duct was successfully checked with digital compression. Suture with Vicryl (Johnson & Johnson, St Stevens-Woluwe, Belgium) 3.0 was finally performed.

Histologic examination diagnosed PA of the minor salivary glands, apparently capsulated, and all margins were free from neoplastic infiltration. Piperacilline and cortisone therapy was administrated to the patient, and on the third postoperative day, the patient was dismissed. Clinical follow-up is still ongoing, and at the 10th postoperative month, no relapse or postsurgical complications were found.

**DISCUSSION AND CONCLUSIONS**

Pleomorphic adenoma is a common benign neoplasm rising from the ductal epithelium of the salivary glands and is electively localized at the parotid gland. Only few cases of extraparotid localizations of PA were reported in literature: at the lips, of the tongue, the occipital area and of the nasal septum, retropharyngeal area, temporal bone, and the thyroglossal and pitiitary ducts.

The localization of PA at the cheek represents an exceptional finding and should be discriminated from other kinds of lesions affecting the cheek. The differential diagnosis includes other benign cystic adenoma and malignant cheek tumors as cystic adenoma, mucoepidermoid carcinoma and adenoid cystic carcinoma, and inflammatory lesions such as sialolithiasis of an accessory parotid gland. A benign tumor usually presents as an asymptomatic swelling, and ulceration or pain are more frequently associated with the malignant tumors. In the patient we described, the differential diagnosis was based on clinical findings and ultrasound evaluation, which reported eloquent documentation suggestive of PA.

Surgical treatment of PA is mandatory. It has been reported that PA in many patients has focally thin capsules or focal absence of capsule and can contain abnormalities such as satellite nodules or pseudopodia. Because of this finding, leading to a high risk of relapse, intraparotid PA requires conservative parotidectomy and extraparotid PA should be treated with surgical excision enlarged to a part of the same tissue.

In our patient, the removal of the neof ormations was challenging because dissection and surgical excision should preserve the masseter muscle, the Stensen duct, the traverse and facial arteries, and the facial veins. Moreover, canalization of the Stensen duct was performed before surgery to avoid the risk of damage during the maneuvers of mass cleavage.

In our patient, the PA had a complete capsule. Anyway, the mass was entirely removed, along with its capsule and a sufficient margin of healthy tissue, to avoid risk of eventual relapses or future malignant transformations.

**REFERENCES**

It is an extremely rare deformity. According to our present knowledge, approximately 16 cases have been reported in the international literature. In the present study, approximately 16 cases have been reported in the international literature. In the present study, 18 cases were between 1 week and 26 years.

A 2-month-old boy was admitted to our hospital with complaint of vomiting. He was born to a healthy mother at 33 weeks of an uneventful pregnancy. His weight was 2900 g (3–10 percentiles), and length was 49 cm (3–10 percentiles). Vital signs were within reference range. Physical examination revealed a fistula of the palate measuring approximately 5 mm in diameter in the central part of the soft palate (Fig. 1). There was no type of the cleft lip and palate accompanying the fistula. Other system examinations did not show abnormalities. Laboratory investigations showed blood count and biochemical values within reference ranges. There was no family history of cleft lip or palate. There were no radiation treatments, medications, smoking, or alcohol abuse recorded during the pregnancy. The infant had no previous history of serious illness, operation, or trauma to the palatal region. Echocardiographic study showed patent foramen ovale. There were no abnormalities seen in the barium esophagogram. Although surgical closure of the palatal fistula was planned, the family refused the operation. In the follow-up period of 10 months, the congenital fistula was still present, and the patient was then lost the follow-up. In 18 months, the palatal fistula was asked by the family to be closed spontaneously.

**DISCUSSION**

The congenital fistula of the palate was first reported by Veau in 1931. It is an extremely rare deformity. According to our present knowledge, approximately 16 cases have been reported in the international literature. Their ages were between 1 week and 26 years. For many years, several opinions concerning formation of the congenital palatal fistula have been suggested. According to Veau, it was believed that the fistula resulted from a prenatatal rupture of a submucous cleft palate. However, Lynch et al. reported that the submucous cleft of the palate was missing in some of the children with fistula. Fana reported that the fistula was defined as a postnatal appearance of the wide submucous cleft and collapse of the palatal tissue in the maximal tension area during the fetal period. Accidental

**Key Words:** Congenital, fistula of palate, child, spontaneous closure

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### Isolated Congenital Palatal Fistula Without Submucous Cleft Palate

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**Abstract:** Congenital fistula of the palate is a rare deformity. It has been generally associated with cleft palate. Treatment of cleft palate is surgical intervention. We present a child with congenital fistula of palate that was not associated with submucous cleft and closed spontaneously at 18 months.
or artificial intraoral trauma was also proposed. Cheng and Zhou recently suggested that congenital fistula of the palate should be accepted as a failure of the palatal differentiation of the human fetus, which is not caused by an accident or an artificial factor. The congenital fistula of the palate was suggested to occur in patients with the submucous cleft palate, and many authors agreed with this idea. In contrast with reported cases in the literature, our case was not associated with submucous cleft palate.

The aims of the treatment for congenital fistula of the palate are closure of the deformity, lengthening of the soft palate, and reconstruction of the palatal muscular connection, especially of the uvula muscles, as in a complete cleft palate repair. Of various surgical procedures, palatal push-back procedure and Furlow double-opposing Z-plasty technique are the most commonly used methods. Because Furlow's technique had a favorable speech outcome, and also overlapping of palatal musculatures in the midline obtained a durable fistula repair, this technique is recommended by many authors. In our patient, the congenital fistula was closed spontaneously at 18 months without the need of surgery.

In the follow-up period, to avoid nasal regurgitation, patients should be fed frequently, head position should be kept at an angle of 30 to 45 degrees, and feeding bottle with silicone nipple and palatal obturator should be used during feeding.

**CONCLUSION**

If the congenital fistula of the palate is not associated with submucous cleft palate as in our case, the defect may be managed conservatively, and the surgical intervention may be postponed up to 18 to 24 months, the ideal repair time in cleft palate surgery, because of likelihood of spontaneous closure.

**REFERENCES**


**Gossypiboma After Mandibular Contouring Surgery**

**Seung Yong Song, MD,† Jong Won Hong, MD,**
**Won Min Yoo, MD,‡ Kwan Chul Tark, MD, PhD†**

**Background:** *Gossypiboma* is derived from the Latin word *gossypium*, meaning cotton, and it means a postoperatively retained foreign body used in operations. Several cases of gossypiboma have been reported especially after abdominal surgery, but there has not been any reported case in plastic surgery. Mandibular contouring surgery cannot ensure a view wide enough to avoid injury to surrounding structures such as a facial artery and a retromandibular vein. In addition, many surgeons pack the sponge into the operative field to prevent bleeding, and surgeons may neglect remnant surgical materials. Recognition of gossypiboma is essential but is often considerably delayed and cause medicolegal problems. Therefore, it is important to ensure that every effort is made to prevent such occurrences. We had a chance to evaluate and treat gossypiboma, and in this paper, we want to share our experiences.

**Materials and Methods:** In circa 1999 to 2007, there were 3 cases diagnosed as gossypiboma after a mandible angle surgery. All patients were female, and some had signs of fever, swelling, tenderness, and purulent discharge of an oral wound. We performed a computed tomographic scan and blood test, and foreign body removal was done under general anesthesia. Intraoperatively, the diagnosis of gossypiboma was confirmed.

**Results:** All symptoms were reduced or subsided after surgery. It was noted that no postoperative infection remained.

**Conclusions:** Gossypiboma must be considered when fever, unilateral swelling, tenderness, or unhealed oral wound is sustained despite an antibiotic therapy and a drainage procedure after a mandible angle surgery. In that case, a computed tomographic scan can be recommended as an effective method for detection of gossypiboma.

**Key Words:** Gossypiboma, mandible contouring, sponge

**Gossypiboma** means retained foreign body used in operation postoperatively, and it is derived from the Latin word...
gossypium, meaning cotton, and from the Kiswahili word boma, meaning place of concealment. Several cases of gossypiboma were reported in other medical fields after extremity surgery, mainly laparatomy or chest surgery.¹ There has not been any reported case in plastic surgery.

In plastic surgery, mandibular contouring surgery cannot ensure enough view to avoid injuring major structures such as a facial or retromandibular vein. For this reason, many surgeons use sponge packing for bleeding control, and these sponges cannot be removed because of skin redundancy and poor view of the retromandibular area.

The diagnosis of gossypiboma is clinically important because it can lead to an infection, a sustained recovery period, and even a legal problem. In many cases, surgeons may confuse symptoms of gossypibomas with the normal process, diagnosis is delayed, and such problems are aggravated.

No report was documented about gossypiboma after a mandible angle surgery in plastic surgery until now. We experienced 3 cases of

Table 1. Patient Characteristics

<table>
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<th>Patient</th>
<th>Sex</th>
<th>Age</th>
<th>POD at Readmission</th>
<th>POD at Reoperation</th>
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<td>15</td>
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POD indicates postoperative day.

FIGURE 1. Computed tomographic images of case 1; preoperative axial (above, left) and preoperative coronal views (above, right). Note the retromandibular mass containing bubbles in the center and having the so-called spongiform appearance (arrows); postoperative axial (below, left) and postoperative coronal views (below, right).
gossypiboma during the past several years and want to provide guidance for its evaluation and treatment.

MATERIALS AND METHODS

Between January 1999 and October 2007, 3 cases diagnosed as gossypiboma among patients who were treated for postoperative infection after mandibular contouring surgery in the Severance Hospital and Yongdong Severance Hospital, Seoul, Korea, were reviewed retrospectively. All of the patients were female, with a mean age of 33 years (range, 27–45 y).

Two patients received only mandibular contouring surgery, and 1 patient underwent mandibular contouring surgery with zygoma reduction. These operations were done at local institutes. Two patients were admitted on postoperative days 14 and 25, and computed tomographic (CT) scans were performed. At approximately postoperative days 15 to 27 (mean, 21.7 d), foreign body removal was done and diagnosis was confirmed. One patient was not admitted and followed up in an outpatient clinic basis (Table 1).

An incision was made on the initial surgery site. After enough dissection, retained sponge was removed with a forcep or Kelly clamp. Curettage was done with a curet, and massive irrigation was done with Betadine and an isotonic sodium chloride solution. A closed drainage system was applied. The mucosa was repaired primarily after proper debridement.

RESULTS

The CT scans of the 2 patients revealed the typical pattern of gossypiboma; that is, an ill-defined mass of a low-intensity signal consisted of a spongiform air bubble. Intraoperative findings show purulent fluid collection. Granulation tissue was noted after sponge removal, and curettage was done. Swelling and tenderness were improved after surgery in all patients.

Patient 1

A 27-year-old female patient was discharged after a bilateral mandibular contouring surgery from a local clinic. Unilateral swelling of the mandible angle area was sustained despite oral antibiotics therapy and wound care at the initial hospital. The patient was admitted to our hospital on postoperative day 25. Dehiscence of an unhealed oral wound was noticed. Purulent discharge was noted from this area. Neither fever nor chill were noted, and there was only minimal tenderness on the swollen site. Unilateral prominent swelling of the mandible angle resulted in facial asymmetry. Blood test and CT were performed after admission. White blood cell count was 6200/μL, and no polymorphonuclear cell predominance emerged. C-reactive protein level was elevated to 38.9 mg/dL. The CT scan showed the typical pattern of gossypiboma, which is a low-intensity, ill-defined mass that contains a spongiform air bubble (Fig. 1). Foreign body removal was done under general endotracheal anesthesia. Swelling and tenderness were reduced after the removal. The patient was discharged after 1 week.

Patient 2

A 45-year-old female patient was admitted because of sustained swelling and tenderness after a mandibular contouring surgery. There was no improvement after intravenous antibiotics and incision and drainage procedure. Facial asymmetry was noted because of unilateral mandible area swelling. Neither fever nor chill was noted. A CT scan showed a typical gossypiboma (Fig. 2). Foreign body removal was done under general endotracheal anesthesia. Swelling and tenderness were reduced after the removal. The patient was discharged after 1 week.

DISCUSSION

Nowadays, increased aesthetic concerns lead to a wide spread of mandibular contouring surgery. A packed sponge during mandibular contouring surgery can be neglected because of the surgeon’s limited operative view. Many surgeons often pack sponges into the operative field during a mandible angle surgery to avoid injury to a facial artery and a retromandibular vein due to the same reason. In addition, if the masseter is injured during the operation, muscle bleeding can be induced. Even a small bleeding from an adjacent soft tissue cannot be controlled meticulously because of its limited view. Therefore, sponge packing is widely used in mandibular contouring surgery.

Moreover, the retromandibular area is characterized by a redundant space, so the remaining sponge cannot be suspected from an external view.

Swelling and tenderness after a mandibular contouring surgery can be observed in noncomplicated cases. Most patients were discharged in a condition that these symptoms and signs were not resolved completely. They were followed up in an outpatient clinic basis. In our experiences, swelling and tenderness were resolved after approximately 10 to 14 days to some extent, and it needs approximately several months for complete resolution.
These conditions can be sustained if there is infection, abscess, or hematoma. In case of infection or abscess, leukocytosis or elevation of an inflammatory indicator (C-reactive protein or erythrocyte sedimentation rate) will be presented. Continuous use of antibiotics and incision and drainage can be considered in this situation.

If these measures are not effective, we must suspect gossypiboma. The most effective method to diagnose gossypiboma is CT. In a CT scan, gossypiboma shows a low-intensity, ill-defined mass that contains a spongiform air bubble.

Ultrasonography can be another diagnostic method. In ultrasonography, gossypiboma shows a hypoechogenic mass that has a partial hyperechogenic region and an acoustic shadowing. In our cases, ultrasonography was not performed in our cases.

There was no report of gossypiboma in plastic surgery. However, there were cases of gossypiboma in other medical fields, mainly abdominal surgery of general surgery, obstetric or gynecologic surgery, and chest surgery. There was a report that diagnosis of gossypiboma was delayed up to 40 years. Rarely, they were also reported after shoulder or extremity surgery. The incidence in other medical fields is approximately 1 per approximately 100 to 5000 cases of surgeries. However, it may be underestimated because of legal problems.

According to Prasad et al, pathologically 2 types of reactions are described. One is an aseptic fibrinous response that results in adhesion or encapsulation leading to granuloma formation. The other is an exudative type leading to an abscess formation with or without bacterial superinfection. In our cases, a definite type of reaction cannot be determined because of early detection and treatment of these lesions. However, we think that they are more similar with the latter.

Gossypiboma can cause serious infection, asymmetry of the face, and even legal problems. It should be considered in sustained infection after a mandible angle surgery. Early detection and treatment can minimize an additional complication.

Surgeons must keep in mind the possibility of a remnant sponge in the operative field. Surgical sponges should contain radiopaque material. Accurate count of sponges used in the operation is also important. Above all, the surgeon should remember the presence and location of the sponge packing.

**CONCLUSIONS**

Gossypiboma must be considered if patients complain of sustained swelling, tenderness, and wound problems after a mandible angle surgery despite proper management. Computed tomography can be used as an effective diagnostic method. It showed a low-intensity, ill-defined mass that contains a spongiform air bubble. If gossypiboma is diagnosed, prompt removal and massive irrigation should be done.

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**Bleeding From Posterior Superior Alveolar Artery in Le Fort I Fracture**

**Kun Hwang, MD, PhD,** *Y* **Hyuk Gyooh Choi, MD, MS**

**Abstract:** This article describes a patient in whom significant oronasal bleeding developed after an injury to posterior superior alveolar artery of the maxillary artery in Le Fort I fracture.

A 34-year-old man had a facial injury after an explosion of a furnace. Computed tomography demonstrated Le Fort I fracture, right open zygomatic tripod fracture, and open nasal bone fracture. Blood pressure, hemoglobin, and hematocrit levels had fallen to 110/60 mm Hg, 5.7 mg/dL, and 16.1%, respectively, 10 hours after injury despite continuous blood transfusion. Selective digital angiography confirmed an injury to the posterior superior alveolar artery, with extravasated pooling of contrast material in the maxillary sinus. The distal internal maxillary artery was embolized with n-butyl cyanoacrylate and lipiodol. Postembolization angiogram showed resolution of the contrast leak, and the patient's oronasal bleeding resolved.

We suggest that if the oronasal bleeding continues in Le Fort fracture, bleeding from the posterior superior alveolar artery should be suspected. In case the vital sign is not stable, selective angiography should be performed before surgery.

**Key Words:** Maxillary fractures, maxillary artery, angiography, embolization therapeutic

Severe bleeding resulting from maxillofacial trauma is rare, and in most cases, its source can be readily determined, and the bleeding is controlled; however, in midfacial fracture, the extensive vascularity of the face causes massive blood loss and hemorrhagic shock. In life-threatening bleeding after facial fractures, angiographic embolization is preferred.

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FIGURE 2. Selected external carotid angiogram, right side. A, Scout image. Fracture is seen at the right zygomatic buttress (arrow). B, Angiogram before embolization. Right external carotid injection demonstrates extravasation of contrast medium (area between arrowheads) from the posterior superior alveolar artery. C, Angiogram after embolization of the right maxillary artery. Occlusion of the maxillary artery (arrow) and disappearance of the extravasation (area between arrowheads) are shown. E indicates external carotid artery; S, superficial temporal artery; M, maxillary artery; Mm, middle meningeal artery.

FIGURE 3. Pre-embolization and postembolization computed tomography images. A, Pre-embolization axial image shows fracture of the walls of the maxillary sinuses. B, Postembolization axial image. The arrow indicates the hyperdense embolus occluding posterior superior alveolar artery. C, Postembolization coronal image shows fractures of lateral margins of the nasal fossa and lateral wall of maxillary sinuses. The arrow indicates hyperdense embolus occluding posterior superior alveolar artery.
Isolated Lower Lip Fistulas in Van der Woude Syndrome

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Abstract: Van der Woude syndrome (VWS) is a dominantly inherited disease of orofacial region. Characteristic features of this syndrome are bilateral lower lip sinuses along with cleft lip or palate deformity. However, isolated lower lip pits in WVS without any cleft syndrome is uncommon. Lip pits in WVS are usually asymptomatic; however, patients may complain of watery drainage and/or infection. In this report, asymptomatic isolated lower lip sinuses without any cleft syndrome in a patient and his father are presented.

Key Words: Van der Woude syndrome, lower lip fistula, cleft syndrome

Van der Woude syndrome (VWS) is an autosomal dominant disorder that is characterized by bilateral symmetrical lower lip fistulas with concomitant cleft lip and/or palate. Whereas Demarquay was the first who introduced this syndrome, comprehensive determination of the clinical features of the disease-like coexistence of cleft lip or palate with lip sinuses was described by Van der Woude. Single-lip sinuses without any cleft syndrome are rare; lower lip fistulas in VWS are generally asymptomatic, and surgical management is usually accomplished because of aesthetic concerns. However, in some cases, patients may complain of watery drainage or

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hypotonia of the lower lip. In this report, surgical management of a patient with VWS with familial expression is presented.

CLINICAL REPORT

A 22-year-old otherwise healthy man applied to our department with complaint of congenital bilateral symmetrical lower lip pits (Fig. 1). The patient had no history of cleft lip and/or palate and hypernasal voice or dental abnormalities. Main complaint of the patient was poor cosmetic appearance. No history of infection or drainage was noted. The patient's father was also affected with the same disease without any cleft lip or palate (Fig. 2). Based on clinical and familial history of the patient, final diagnosis was made as VWS. Both patients were scheduled for operation; however, the patient's father denied surgery. The patient was operated on under local anesthesia. An incision including both lip pits was made, and lower lip fistulas were excised. Postoperative healing was uneventful, and aesthetic outcome of the patient was quite satisfactory (Fig. 3).

DISCUSSION

Van der Woude syndrome is a familial congenital disorder affecting 1:35,000 to 1:100,000 of the population and 2% among cleft patients without any sexual predomination. Although it has been reported that half of the patients with VWS have concomitant cleft lip or palate, most reported cases of VWS were associated with cleft lip and palate or submucosal clefts. Concomitant existence of the lower lip pits with cleft lip or palate is thought to be related with disruption of the fusion of both maxillary and lower lip processes during intrauterine life, which occurs simultaneously. The severity of the syndrome in parents is strongly correlated with severity in children. Both patients in the present report had no other congenital cleft deformity indicating a paternal inheritance.

Differential diagnosis of VWS should be done with popliteal pterygium syndrome and orofaciodigital syndrome. In popliteal pterygium syndrome, popliteal pterygia, phenotypical genital abnormalities, and syndactyly of fingers or toes may have been seen in addition to lower lip pits, whereas in orofaciodigital syndrome, orodigital abnormalities are more evident, and also, lower lip fistulas are uncommon.

Treatment of VWS is surgical excision of lower lip fistulas. It has been reported that surgical management is not always indicated especially for asymptomatic cases. However, aesthetic and functional improvement might be provided with meticulous surgery. Some authors used bacitracin ointment with methylene blue to
Prosthetic Rehabilitation of a Patient With a Mandibular Defect Caused by a Gunshot Wound

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Emrah Baca, DDS,* Deniz İşk, DDS‡ Uğur Meriç, DDS, PhD‡

Abstract: Injuries to the orofacial region may vary from localized injuries to extensive soft and hard tissue loss. In addition to physical and psychologic damages, functional and aesthetic aspects must be restored. This clinical report describes the rehabilitation of a patient with a mandibular defect caused by a gunshot wound. Rehabilitation of this patient, with the use of an overdenture prosthesis, was performed after mandibular surgical hard and soft tissue reconstruction. A maxillary total prosthesis and an implant-supported mandibular overdenture supported by 4 osseointegrated implants were fabricated. Despite limited mouth opening and anatomic deficiencies, the patient's aesthetic and functional demands were fulfilled.

Key Words: Trauma, dental implant, prosthesis

With the increase of weapon accessibility to the public, gunshot injuries have become a common cause of facial trauma. Although such injuries may not create life-threatening problems, they can result in serious functional disability, as well as significant psychologic and cosmetic deficiencies.

Discontinuity defects are usually treated with bone grafts in combination with flap constructions, nonvascularized flaps, or free tissue transfers. Surgical reconstruction may not always address the patient's aesthetic requirements, and prosthetic rehabilitation is usually required.

Bone and soft tissue loss makes overdentures the most effective treatment modality for patients with intraoral defects. This type of prosthesis provides improved support for the lips and soft tissues of the face, replacing the tissue loss in an easier and more aesthetic approach than do fixed restorations. Teeth may be compromised or may be lost during the reconstruction phases. Stability and retention problems are often encountered. The prosthetic rehabilitation can be accomplished with the placement of implants.

The purpose of this report was to present the prosthetic rehabilitation of a patient with a gunshot-related mandibular defect treated with an implant-supported overdenture. A 68-year-old man with a surgically reconstructed mandibular defect caused by a penetrating gunshot wound to the anterior mandible was referred to the Department of Maxillofacial Prosthetics. The patient had oral incompetence, and his history revealed a number of hard and soft tissue reconstructions. The patient had been shot with a short-barrel gun in October 2002. His anterior mandible and surrounding soft tissues had been injured; he had a large bony defect in his symphysis. According to his medical records obtained from his physician, shortly after his presentation to the hospital, he had required tracheostomy because of difficulty in obtaining an endotracheal route. Then, standard resuscitation protocols had been followed; an immediate reconstruction of the central mandibular discontinuity defect and soft tissue deficiency had been planned. After the stabilization of the general condition of the patient, he underwent surgery. An autogenous block graft harvested from the fibula had been performed, and local flaps had been used for the correction of the soft tissue defect. The patient had been discharged from the hospital and had been referred for a psychiatric consultation and for dental treatment. He was referred to the Department of Maxillofacial Prosthetics, and he received complete dentures in the upper and lower jaw. He did not attend his dental follow-up appointment or any of his control appointments by plastic and reconstructive surgery team for 8 months. When he had come to his surgeon because of pain in the anterior mandible, oroantral fistulae development had been determined. After the radiographic examination, the removal of the necrotic bone graft had been performed. The graft had been lost after 13 months. The mandibular fragments were maintained in position with reconstruction plates, and the soft tissues had been reconstructed at the time of surgery with pectoralis major myocutaneous flap (Fig. 1). He was referred to the Department of Maxillofacial Prosthetics for the second time. He explained that his main complaint was lack of stabilization and retention of the denture during function, and he strongly resisted wearing complete lower denture. A comprehensive treatment plan based on clinical and radiographic findings and specialty consultations with the head and neck surgeon and the oral surgeons was presented to the patient. Fabrication of an overdenture supported by

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osseointegrated implants in the mandible and a complete denture in the maxilla were planned, and the potential risks were explained to the patient. A written consent form was taken from the patient stating that he is taking the whole responsibility of the treatment.

The surgical procedure was conducted in 1 stage following the general guidelines defined by Brånemark and the specific indications recommended by Buser et al for ITI (Institut Straumann AG, Waldenburg, Switzerland) implants. A total of 4 ITI implants (Table 1) were placed (Figs. 2 and 3).

Implants were allowed to integrate for 6 weeks. At the end of this period, the stability of the implants was evaluated with a Resonance Frequency Analyzer/Ostell Mentor (Mentor Integration Diagnostics, Savedalen, Sweden); the measurements were sufficiently high for an abutment connection. The preliminary impressions were made with irreversible hydrocolloid impression material; custom impression trays were fabricated (Alginoplast, Heraeus Kulzer GmbH, Hanau, Germany). The accurate registration of the denture-bearing tissue and the peripheral anatomy was made with Kerr Impression Compound (Kerr Hawe SA, Bioggio, Switzerland) and SS White Impression Paste (White Group, Gloucester England) using the physiologic impression technique. The final impression was then completed with the injection of a light-body, vinyl impression material around each impression coping to record three-dimensionally accurate implant positions and individual implant trajectories to the master cast. The physiologic impression of the upper jaw was made with Kerr Impression Compound (Kerr Hawe) and also SS White Impression Paste. Master casts were obtained from these impressions.

Abutment selection was performed on the master cast. A final intraoral trial was made; acrylic resin teeth setup, extensions, and occlusion were controlled, and aesthetics was approved by the patient. Anatomic teeth were selected, and bilaterally balanced occlusion was applied (Dentatus USA, New York). The prostheses were processed with heat-polymerized acrylic resin (Meliodent Heat Cure; Heraeus Kulzer GmbH & Co, KG, Hanau, Germany) using a standard compression molding protocol (Fig. 4).

At the delivery appointment, the anterior intaglio portion of the mandibular overdenture where the reconstruction plate lies was so modified that the contacts between the denture and the underlying soft tissues were removed. The abutments were tightened to 35 N cm. The patient received strict oral hygiene instructions, and routine recall appointments were performed on a regular basis. Follow-up after 2 years showed no bone resorption and no inflammation around the fixtures. The patient was satisfied with the function and aesthetics of the denture.

**DISCUSSION**

Gunshot wounds to the face can cause serious problems in aesthetics and function. Bone grafting accompanied by free soft tissue grafting is frequently necessary to restore the tissue loss. Advanced surgical procedures have been proven to present satisfactory outcomes, but prosthetic rehabilitation is almost always required to replace tissue loss and to correct occlusal problems. This clinical case demonstrates implant-supported prosthetic rehabilitation of a patient with a traumatic gunshot defect.

When trauma causes significant defects in the maxillofacial region, fabrication of overdentures is preferred as both hard and soft tissue loss and lip support can be compensated by means of acrylic resin. The overdentures are usually supported with implants placed in the anterior mandible and show a high success rate. The residual alveolar bone shape is an important factor in determining the number of implants to be placed for overdenture support. Usually, the posterior region is not preferred because of excessive alveolar ridge resorption. In this clinical case, implants could not be placed in the anterior mandible because the bone graft used to reconstruct the anterior segment of the mandible failed because of

<table>
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<tr>
<th>Implant Location</th>
<th>Implant Diameter, mm</th>
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**FIGURE 2.** Pretreatment view of the patient. The soft tissue loss was corrected successfully.

**FIGURE 3.** The osseointegrated implants are placed in the posterior sides of the mandible.
A reconstruction plate is not the standard of clinical care today, fabrication of a mandibular prosthesis was the only treatment alternative for this patient. In such a case, reconstruction plates are prone to potential complications that may result in loosening of the screws and the resultant plate and/or fracture of the plate over time. Furthermore, there is the risk of dehiscence of the reconstruction plate through the soft tissues due to compression of the tissues against the plate by the denture base. To reduce the risk of failure, the intaglio surface of the denture was modified; any contact between the denture surface and the soft tissue overlying the plate was removed, and maximal extension of the prosthesis on the posterior soft tissues was preferred to distribute masticatory forces. Such a modification will reduce the compressive forces placed on the reconstruction plate.

Several different attachments are available for use with implant-supported overdentures. Four implants connected by a rigid bar would secure retention and stability and minimize the overload on vulnerable soft tissues. This approach could not be applied because the mesial implants on each mandibular fragment were too far from the midline. The implants on each fragment could have been connected with each other, but the interimplant distance was insufficient. An interim implant distance at a minimum of 12 mm is needed to provide sufficient space to accommodate the retentive components. As a result, Locator attachments (Zest Anchors, Inc, SA, Agno, Switzerland) were used.

The importance of appropriate hygiene procedures for the maintenance of the peri-implant tissues is strongly emphasized in the literature. The patient was given strict oral hygiene procedures. At the 3-month, 6-month, 1-year, and 2-year recall visits, no peri-implant problems were observed.

**CONCLUSIONS**

This case confirms the view expressed in the literature that patients with traumatic injuries have specific treatment needs, and osseointegrated implants can provide excellent support for dental rehabilitation of these patients, both functionally and aesthetically.

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