9. Hemmig SB, Johnson RS, Farraro N: Management of a ruptured pseudoaneurysm of the sphenopalatine artery following a Le Fort I osteotomy. J Oral Maxillofac Surg 45:533, 1987
10. Newhouse RF, Schow SR, Kraut RA, et al: Life threatening haemorrhage after Le Fort I osteotomy. J Oral Maxillofac Surg 40:117, 1982
11. Welman K: On Le Fort I osteotomy. Scand J Plast Reconstr Surg [Suppl] 12:19, 1974
12. Brady S, Courtemandre A, Steinbok P: Carotid artery thrombosis after elective mandibular and maxillary osteotomies. Ann Plast Surg 6:121, 1981
13. Lanigan DT, Romanchuk K, Olson CK: Ophthalmic complications associated with orthognathic surgery. J Oral Maxillofac Surg 51:480, 1993
14. Uttley D, Moore A, Archer DJ: Surgical management of midline skull-base tumor: A new approach. J Neurosurg 71:705, 1989

J Oral Maxillofac Surg
53:467-469, 1995

Cavernous Hemangioma of the Masseter Muscle:

Report of a Case

BRIAN HART, DDS,* AND HARRY C. SCHWARTZ, DMD, MD†

Intramuscular hemangiomas are relatively rare, accounting for less than 1% of all hemangiomas.[1] Of these, 14% occur in the head and neck. The masseter and trapezius muscles are the most common sites of involvement.[2-5] Because of their infrequency, deep location, and unfamiliar presentation, these lesions are seldom correctly diagnosed clinically. The following report describes a case that clinically resembled unilateral benign masseteric hypertrophy.

Report of Case

A 9-year-old Hispanic girl was referred to our service by Pediatric Surgery in June 1983 with a complaint of a painless swelling of the left cheek causing facial asymmetry. Her parents had first noticed the swelling when she was 2 years of age.

Examination showed a fullness in the left buccal region below the zygomatic arch (Fig 1A). The area was nonpulsitile and there were no bruits present on auscultation. When the patient clenched her teeth, a firm bulge appeared along the superior aspect of the masseter muscle just inferior to the zygomatic arch (Fig 1B). This association with contraction of the masseter muscle led to a clinical diagnosis of unilateral benign masseteric hypertrophy. The patient's parents were concerned about the cosmetic deformity caused by this lesion and at their request, she was electively admitted for surgical exploration and probable partial resection of the left masseter muscle. Admission laboratory examination included a complete blood count, coagulation screen, and urinalysis that were within normal limits.

Under general anesthesia using endotracheal intubation, an incision was made in the left retromandibular area from the tragus of the ear to approximately the antegonial notch. The dissection was carried anteriorly and superiorly just superficial to the masseter muscle. As in many children, the parotid gland was not well developed. The branches of the facial nerve were clearly identified in the surgical field. The dissection was continued to the area where most of the swelling was noted on clinical examination. At this point, near the origin of the masseter muscle on the zygomatic arch, a vascular lesion was noted to be protruding in an aneurysmal fashion between the muscle fibers (Fig 2). Compression of the inferior portion of the masseter caused a ballooning effect, which corresponded to the area of tumescence observed clinically. It was evident that this was a true vascular lesion located within the substance of the masseter muscle rather than masseteric hypertrophy. By careful blunt dissection of the muscular fibers, it was found that much of the lesion, aside from the obvious aneurysmal dilatation, arose from beneath the anterosuperior aspect of the muscle. It was believed that the remainder of the lesion would not be surgically accessible without risking serious hemorrhage. Therefore, the aneurysmal portion was cross-clamped, excised, and sent for histologic examination. The lumen of the lesion was oversewn with vascular sutures. Closure of the wound was accomplished without difficulty.

The patient had an uneventful postoperative course. On the second postoperative day, angiograms were performed on the left internal and external carotid arteries and no abnormality was noted. This suggested a low-flow lesion with slow filling. Magnetic resonance imaging (MRI) was not available at that time. The histologic appearance was consistent with a diagnosis of cavernous hemangioma (Fig 3).

The patient was offered additional treatment in the form of sclerotherapy or embolization, but her parents were concerned with potential risks and opted against doing anything further. An MRI was carried out in 1987. It showed a mass

* Attending Surgeon, Harbor-UCLA Medical Center, Torrance, CA, and in private practice, Los Angeles and Bellflower, CA.
† Chief, Maxillofacial Surgery, Southern California Permanente Medical Group; Associate Professor, University of California, Los Angeles, CA.
Address correspondence and reprint requests to Dr Schwartz: 4900 Sunset Blvd, Los Angeles, CA 90027.

0278-2391/95/5304-0019$3.00/0

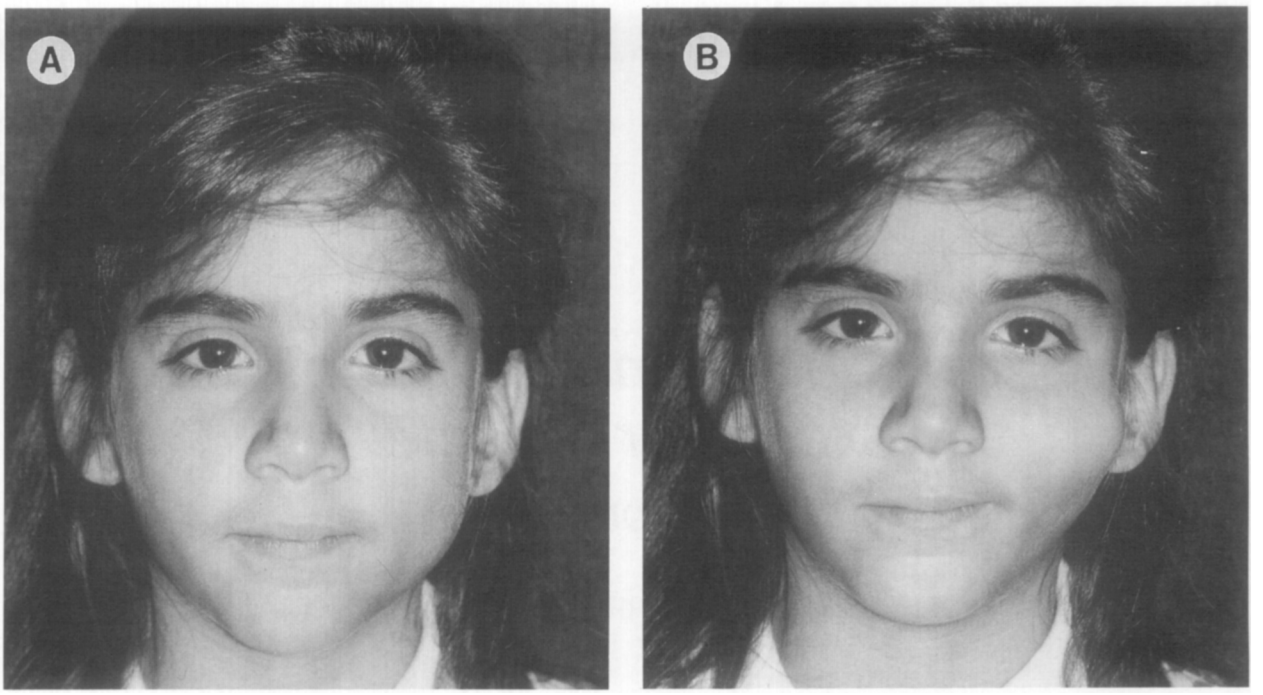

FIGURE 1. A 9-year-old Hispanic girl referred for evaluation of a swelling in the area of the left masseter muscle. *A,* Patient with mandible at rest. *B,* A firm bulge appears beneath the zygomatic arch at the anterior aspect of the masseter muscle when the patient clenched her teeth.

of uniformly high signal intensity within the left masseter muscle, consistent with an intramuscular hemangioma. She has now been followed for 11 years and there has been little change clinically. She continues to decline further treatment.

Discussion

The diagnosis of intramuscular hemangioma can be difficult. With the rarity of these lesions, their deep location, and their variable clinical presentation, previous investigators acknowledge that the preoperative diagnosis is rarely accurate.[4,6]

Although intramuscular hemangiomas, in general, show an equal sex distribution, involvement of the masseter muscle has a definite male predominance (3:1). Approximately 90% of these lesions develop before the age of 30 years.[2] Pain is the most common symptom, present in about 60% of all patients. Thrills, bruits, and pulsations are uncommon findings and usually indicate large vessel involvement. Occasionally, maneuvers that increase venous pressure or contract

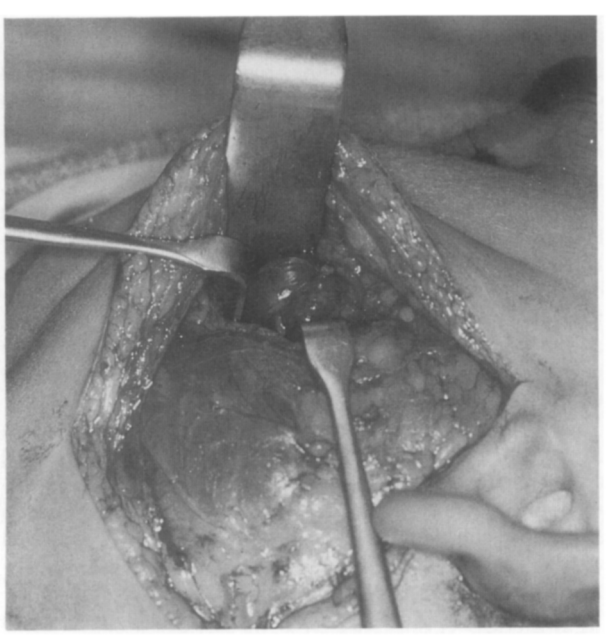

FIGURE 2. A lesion that resembles a large dilated vein protrudes along the anterior edge of the masseter muscle.

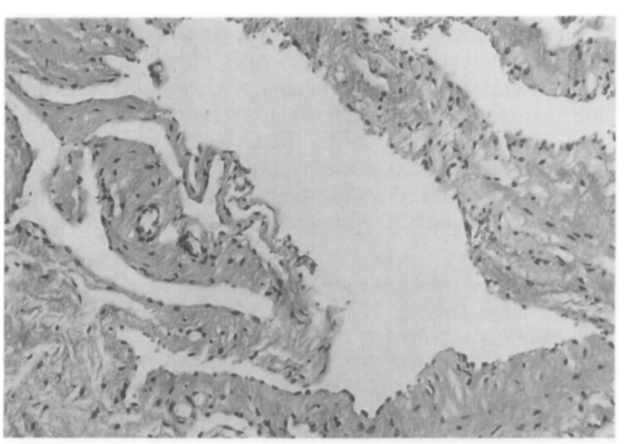

FIGURE 3. Photomicrograph showing multiple vascular lumens lined by endothelial cells, consistent with cavernous hemangioma (hematoxylin-eosin stain, original magnification ×440).

the musculature may disclose the lesion clinically.[6] Because of their location, masseteric lesions have been commonly mistaken for parotid masses.[3]

This case clinically resembled benign masseteric hypertrophy (BMH). BMH is an uncommon lesion that must be included in the differential diagnosis of masses found in the cheek. Although the average age of patients with BMH is 30 years, occasional cases have been reported in children.[7] Forty percent are unilateral in nature. Clenching the teeth usually converts these swellings into firm masses attached to the underlying mandible. Often flaring or "spurs" are seen at the angle of the mandible in posteroanterior radiographs.[7,8]

In general, once parotid pathology or an infectious process has been ruled out, BMH, a neoplasm, or a vascular lesion must be suspected in all swellings of the cheek. Although Finn et al[9] reviewed 375 vascular lesions and found that 96% could be diagnosed by history and clinical examination alone, intramuscular lesions remain elusive. Contrast-enhanced computed tomography or MRI are excellent diagnostic modalities in such situations. They enable the clinician to differentiate between neoplastic and vascular processes and have been cited as being extremely effective in establishing the diagnosis of benign masseteric hypertrophy.[7] Although angiography is useful in the diagnosis of vascular formations,[10] it may not be helpful for imaging lesions that do not contain large vessel connections.[2]

References

1. Watson WL, McCarthy WD: Blood and lymph vessel tumors: Report of 1056 cases. Surg Gynecol Obstet 71:569, 1940
2. Welsh D, Hengerer AS: The diagnosis and treatment of intramuscular hemangiomas of the masseter muscle. Am J Otolaryngol 1:186, 1980
3. Stofman GM, Reiter D, Feldman MD: Invasive intramuscular hemangioma of the head and neck. Ear Nose Throat J 68:612, 1988
4. Wolf GT, Daniel F, Krause CJ, et al: Intramuscular hemangioma of the head and neck. Laryngoscope 95:210, 1985
5. Broniatowski M: Intramuscular hemangioma of the masseter and sternocleidomastoid muscles. Ear Nose Throat J 72:303, 1993
6. Conley JJ, Clairmont AA: Intramuscular hemangioma of the masseter muscle. Plast Reconstr Surg 54:121, 1977
7. Iizuka T: Excessive transverse facial width: Surgical correction of masseteric muscle hypertrophy, *in* Bell WH (ed): Modern Practice in Orthognathic and Reconstructive Surgery. Philadelphia, PA, Saunders, 1992, pp 426-439
8. Riefkohl R, Georgiade G, Georgiade NG: Masseter muscle hypertrophy. Ann Plast Surg 12:528, 1984
9. Finn MC, Glowacki J, Mulliken JB, et al: Congenital vascular lesions: Clinical application of a new classification. J Pediatr Surg 18:894, 1983
10. Yeoman CM: Management of hemangioma involving facial, mandibular, and pharyngeal structures. Br J Oral Maxillofac Surg 25:195, 1987

J Oral Maxillofac Surg
53:469-473, 1995

Sphenoid Carcinoma:
Report of a Case

GREGORY J. LUTCAVAGE, DDS,* SIEGFRIED J. SCHABERG, DDS, PHD,* AND DEBORAH K. FULBRIGHT, MD†

Carcinoma of the paranasal sinuses accounts for 0.2% of all neoplasms.[1] Primary carcinoma of the sphenoid sinus is an extremely rare tumor that can be very difficult to diagnose unless the clinician maintains a high degree of suspicion during the time of the diagnostic evaluation. The purpose of this report is to present a patient who had a primary sphenoid sinus carcinoma.

Received from Wayne Memorial Hospital, Goldsboro, NC.
* Attending Oral and Maxillofacial Surgeon, Department of Surgery; in private practice, Goldsboro, NC.
† Attending Anatomical and Clinical Pathologist, Department of Surgery, Section of Pathology.
Address correspondence and reprint requests to Dr Lutcavage: 2400 Wayne Memorial Dr, Goldsboro, NC 27534.

0278-2391/95/5304-0020$3.00/0

Report of Case

A 38-year-old black man reported for follow-up 12 days after having undergone treatment for an apparent dental infection at Wayne Memorial Hospital (Goldsboro, NC). He had initially seen his family physician 2 months prior to this admission for mandibular pain, limitation of mandibular motion, and a prominent right neck swelling. He was placed on an oral antibiotic regimen and his symptoms had partially resolved. However, a recurrence necessitated a visit to the Emergency Department where an oral and maxillofacial surgery consultation was obtained. The patient was admitted, placed on parenteral antibiotic therapy, and had multiple abscessed root tips removed. He was subsequently dis-