

Pseudoaneurysm of the Greater Palatine Vessel Following Subepithelial Connective Tissue Graft

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Subepithelial gingival connective tissue grafts are a common surgical procedure performed in periodontal and implant surgery. This versatile procedure has many indications including tooth root coverage, thickening of gingiva, and improvement of the quality of the crestal gingiva. Several techniques have been described for graft harvest from the palate. Reported complications from these techniques include pain, inflammation, bleeding, flap necrosis, and infection in the donor site. We report a previously unpublished complication following subepithelial gingival connective tissue graft from the palate: pseudoaneurysm of the greater palatine vessel.

Key Words: case report/series, connective tissue graft, pseudoaneurysm, embolization, greater palatine vessel

CASE REPORT

A 77-year-old female was brought in by Emergency Medical Services to the emergency department (ED) reporting 24 hours of intermittent bleeding from her oral cavity. On presentation in the ED, the patient was found to be hypotensive with a systolic blood pressure of 60 mmHg, although she was alert and oriented. The patient had a medical history of atrial fibrillation (she was taking apixaban [Eliquis] for an unknown duration of time, but had decided on her own to discontinue the medication for the 24 hours before presentation) and hypertension. One week earlier a dental practitioner had taken a connective tissue graft from the patient's left palate. Apixaban was not discontinued for the surgical procedure. The patient states that she had a normal postoperative course until experiencing bleeding on postoperative day 6.

In the emergency department, no active bleeding was initially noted but multiple clots and several episodes of coffee ground emesis occurred. Initial labs revealed a hemoglobin of 6 g/dL. Fluid resuscitation including administration of packed red blood cells was initiated. During the ED course, the patient began to have pulsatile bleeding from the oral cavity and the Oral and Maxillofacial Surgery Service was consulted. Finger pressure was applied to the palate and the oropharynx was suctioned free of blood. Finger pressure on the anterior left hard palate stopped the bleed. In addition a palpable thrill was felt. Because the bleed appeared to be originating from the

greater palatine artery, a 3-0 chromic suture was placed through the posterior hard plate. When secured, the suture temporarily stopped the bleeding and pulsation (Figure 1). The patient was admitted to the medical service and continued to be followed. Approximately 3 hours later the anterior palate began to rebleed in a fashion similar to that previously observed. Another suture was placed in the posterior hard palate as before and the bleeding stopped.

To better evaluate the nature of the bleed, the patient was taken for maxillofacial computerized tomography (CT) angiography. The study was limited by the ligation of the greater palatine vessels, but did reveal a small hyperdense focus within the anterior left palate, which had not been previously observed. This raised the possibility of a small area of contrast extravasation (Figure 2). The Neuroendovascular Surgery department at an affiliate hospital was consulted for angiography and embolization of a presumed ruptured pseudoaneurysm of the left greater palatine vessel. The patient was transferred in stable condition to the angiography suite. Under monitored anesthesia care, angiogram demonstrated pseudoaneurysm of the distal aspect of the left greater palatine artery (Figure 3), which was managed by embolization of the greater palatine artery with N-butyl cyanoacrylate glue (Figure 4). The patient tolerated the procedure well and had no rebleeding postembolization. The patient has been seen for follow-up and the palatal site is healing well.

DISCUSSION

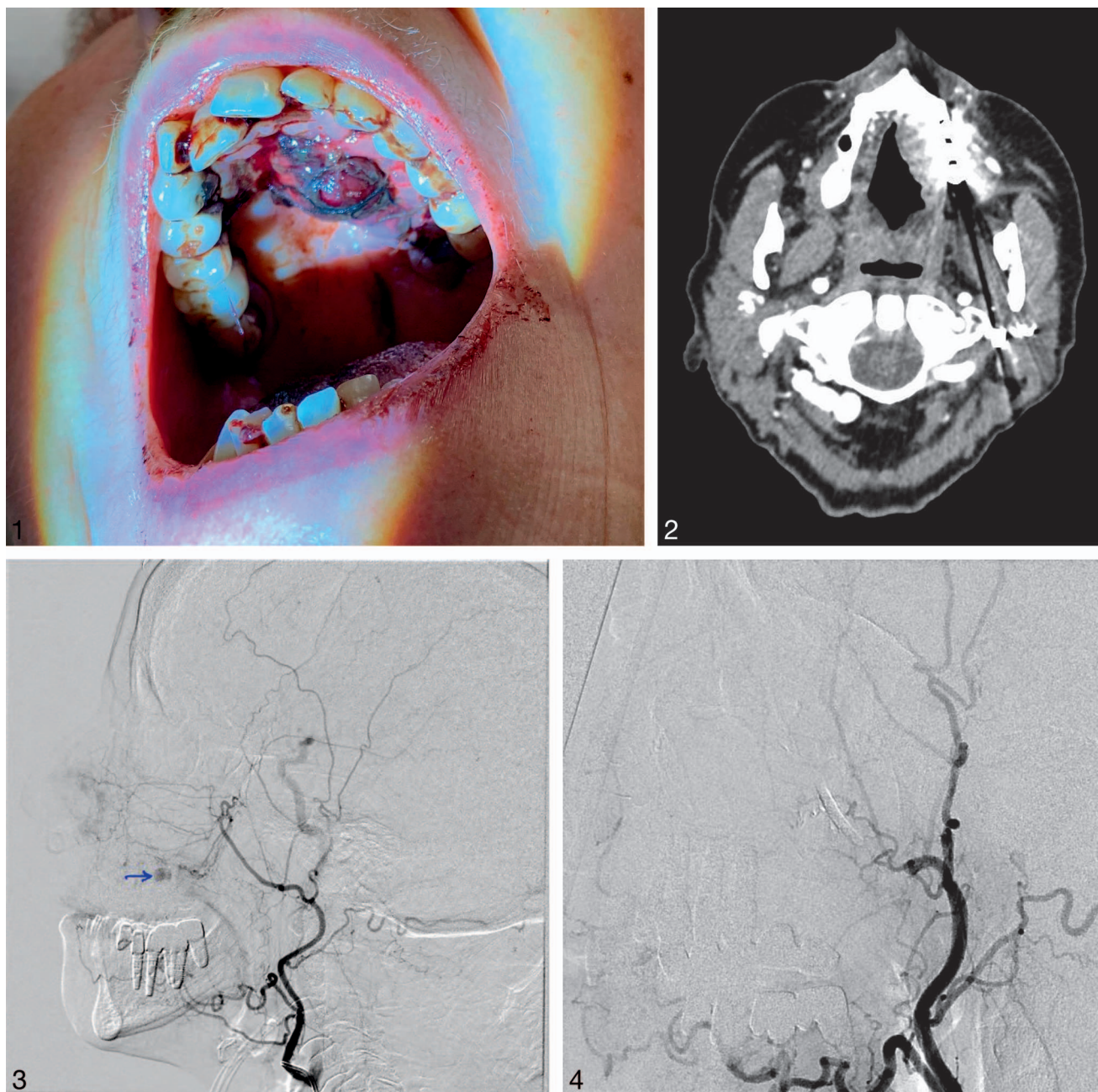
Gingival connective tissue graft is a procedure commonly performed to obtain tissue for a variety of applications, including root coverage and thickening of gingival tissue at the recipient site. The technique was first introduced for root coverage by Langer and Langer.¹ Numerous harvest techniques have been proposed to decrease donor site morbidity.^{2,3}

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FIGURES 1–4. **FIGURE 1.** Clinical appearance after ligation of greater palatine artery. **FIGURE 2.** Computerized tomography angiography following ligation with possible contrast extravasation (red arrow). **FIGURE 3.** Angiogram demonstrating pseudoaneurysm of the greater palatine vessel. **FIGURE 4.** Postembolization angiogram.

One major anatomic structure that may be encountered during the procedure is the greater palatine neurovascular bundle. This structure branches off of the descending palatine and courses anteriorly from the greater palatine canal along the junction of the hard palate and alveolar process.⁴

The most commonly cited complications from the subepithelial connective tissue donor site include pain, bleeding, infection, and necrosis. Bleeding from the greater palatine vessel generally will occur during the procedure or in the immediate postoperative period. In this case, bleeding began spontaneously at 1 week after the procedure. This is consistent

with the presentation of ruptured pseudoaneurysm. Pseudoaneurysms are vascular lesions that occur secondary to blunt or penetrating trauma leading to an extravasation of blood. In the oral and maxillofacial surgery field, they have been reported to occur after orthognathic surgery, temporomandibular joint surgery, maxillofacial fractures, and tooth extraction.⁵ We did not find any reports indicating an increase in pseudoaneurysm formation in patients taking apixaban. In a true aneurysm, all 3 layers of the vessel wall (tunica intima, tunica media, and tunica adventitia) are weakened to form a blood-filled sac. In a false aneurysm, or pseudoaneurysm, blood accumulates only in the

outer 2 layers of the vessel wall (tunica media and tunica adventitia), forming a pulsatile mass.⁶ Clinical signs usually arise several weeks or even months after initial trauma. Pseudoaneurysms of branches of the internal maxillary artery are uncommon and because of its location, rupture and hemorrhage of such lesions cannot be easily managed by digital pressure alone. Contrast-enhanced CT and angiography are the gold standards in diagnosis and excellent outcomes are seen with selective vessel embolization by an endovascular catheter through the femoral artery to the external carotid artery and its branches. This technique allows for a less invasive approach that can be immediately verified through angiography. To perform this technique the endovascular surgeon guides a catheter from a major proximal artery to the region of concern. Then (in this case) an embolization glue is injected into the vessel proximal to the bleed. The glue occludes the vessel and stops the bleeding. This is confirmed with postembolization angiography of the vessel. If there is recurrent bleeding after embolization, surgical exploration may be performed to excise the pseudoaneurysm.⁷ To our knowledge this extremely unusual case is the first report of a ruptured pseudoaneurysm of the greater palatine artery after subepithelial connective tissue graft from the palate. Unlike the immediate perioperative bleeding more commonly associated with this procedure, the pseudoaneurysm has an indolent presentation and can be seen a week or even months postoperatively. Depending on the clinical scenario, the pseudoaneurysm can be managed either

by direct surgical intervention or angiography with selective embolization.

NOTE

There are no conflicts of interest or disclosures for related to this manuscript from these authors.

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