

Endovascular Treatment of Tonsillar Artery Pseudoaneurysm Causing Recurrent Hemorrhages after Tonsillectomy

José E. Cohen MD^{1,2}, J. Moshe Gomori MD² and Eyal Itshayek MD¹

¹Department of Neurosurgery and ²Division of Endovascular Neurosurgery and Interventional Neuroradiology, Hadassah-Hebrew University Medical Center, Jerusalem, Israel

KEY WORDS: embolization, hemorrhage, pseudoaneurysm, tonsillectomy

IMAJ 2015; 17: 453–454

Removal of the adenoids and tonsils remains one of the most commonly performed surgeries in children and young adults. Criteria for tonsillectomy due to recurrent tonsillitis were established by prospective studies in the pediatric population and are applied to adults as well [1]. The most common postoperative complication is post-tonsillectomy and adenoidectomy hemorrhage (PTAH) [2-4], which can be life threatening. We present a case of severe PTAH refractory to cauterization and ligation. Hemorrhage was caused by a tonsillar artery pseudoaneurysm and ascending palatine artery injury; it was ultimately controlled using endovascular techniques.

PATIENT DESCRIPTION

A 30 year old man underwent tonsillectomy after recurrent tonsillitis. The surgical procedure was uneventful. Three days after surgery he reported a major bleed from the left tonsillar bed. He was taken to the operating room and his tonsillar bed was cauterized. Two days later he presented with repeated episodes of tonsillar bleeding, with suspected arterial origin. He again was taken to the operating room and his tonsillar bed was “aggressively” cauterized. Parenteral oxytocin was administered. His

hematocrit dropped from 40% to 33%. Four days later, the patient presented with repeated and massive tonsillar hemorrhages. At this stage, postoperative pseudoaneurysm was suspected and he was taken to the interventional neuroradiology suite.

Using local anesthesia, a 5 Fr femoral introducer was placed into the right femoral artery. After access was obtained, 2500 units of heparin were administered. Angiogram of the left internal carotid artery was normal. Angiogram of the left external carotid artery (ECA) confirmed the presence of a small tonsillar artery pseudoaneurysm and irregularities of the ascending palatine artery, but no active source of bleeding [Figure 1A and B]. A 5F guiding catheter was placed at the proximal left ECA. Coaxially, a microcatheter was navigated through the tonsillar artery. Selective microangiogram revealed a small tonsillar pseudoaneurysm [Figure 1C]. The microcatheter was occlusive at the tonsillar artery and ECA angiogram showed no collateral supply to the pseudoaneurysm. The tonsillar artery was occluded with detachable coils at the origin of the aneurysm. The procedure was complemented with selective injection of 300–500 μ polyvinyl alcohol (PVA) particles through the ascending palatine artery. Post-embolization left ECA angiogram showed exclusion of the tonsillar artery pseudoaneurysm and distal occlusion of the ascending palatine artery [Figure 1D and E].

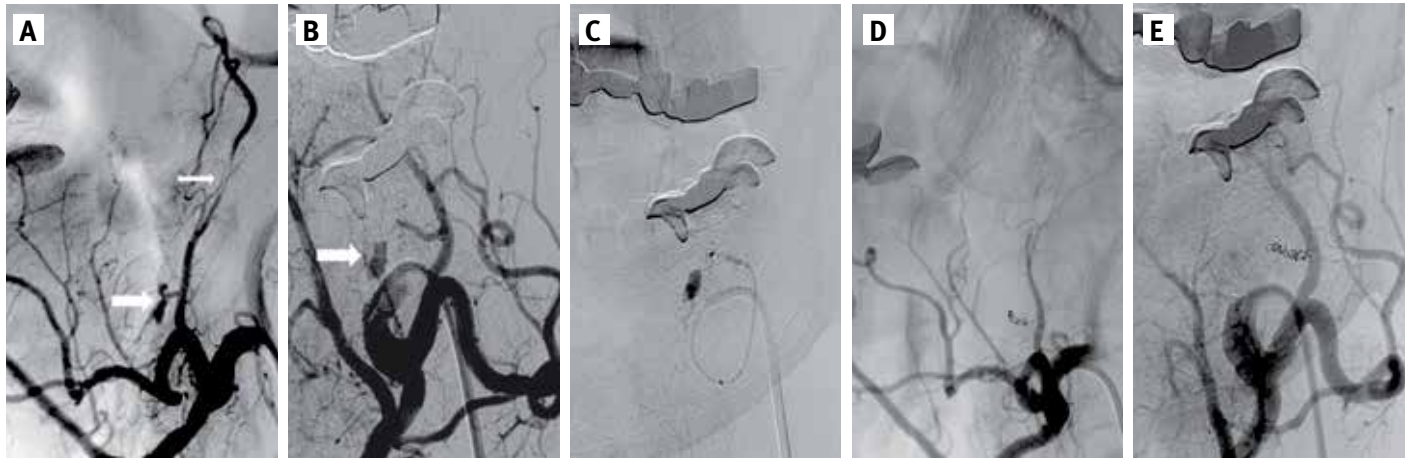
After embolization, the patient remained stable and tolerated a full oral diet. He was discharged 4 days after embolization, and no subsequent bleeding episodes were reported.

COMMENT

A study of post-tonsillectomy hemorrhage reported bleeding in 1.93% of patients. Among those who bled, 12% had a subsequent hemorrhage and 47% required surgical intervention [5]. This complication accounts for the majority of fatalities arising from tonsillectomy and adenoidectomy and represents the most common cause of prolonged post-procedure hospitalization. Different strategies for the management of PTAH have been described, including clot removal, silver nitrate or electrocautery, injection of vasoconstricting drugs, local pressure, suture ligation of bleeding vessels in the tonsillar bed, parenteral oxytocin, and, as a last resort, ligation of the ECA or its branches [3,4]. The case reported here exemplifies the successful management of PTAH by endovascular embolization techniques. Following routine tonsillectomy, the patient was returned to the operating room for three attempts at cauterization due to heavy bleeding from the tonsillar bed. Failed surgical control of the hemorrhage source led to the indication for diagnostic angiogram followed by endovascular embolization. Few descriptions of this potentially life-saving intervention have appeared in the literature [3].

Achieving complete hemostasis after tonsillectomy or adenoidectomy has traditionally been considered a challenge. This is due in part to the generous arterial supply to the palatine tonsils, which includes the descending palatine artery arising from the internal maxillary artery, the ascending pharyngeal artery, the dorsal lingual artery arising from the lingual

Figure 1. A 30 year old man presented with repeated episodes of tonsillar bleeding following tonsillectomy. Selective angiograms of the left facial-lingual common trunk show the tonsillar artery pseudoaneurysm (thick arrows) and ascending palatine artery irregularities (thin arrow) on [A] lateral and [B] modified antero-posterior views. [C] Microangiography of the tonsillar artery shows the tonsillar pseudoaneurysm. Post-embolization angiograms of the left facial-lingual common trunk on [D] lateral and [E] modified antero-posterior views show occlusion of the tonsillar artery pseudoaneurysm by proximal coiling, and occlusion of the distal ascending palatine artery after selective injection of 300–500 μ polyvinyl alcohol (PVA) particles



artery, and the ascending palatine artery and tonsillar artery originating from the facial artery. Diagnostic angiogram should include examination of all these potential arterial sources. Every attempt should be made to comprehensively study the ECA and its branches. Selective arteriograms of the internal maxillary, facial and lingual arteries are obtained when necessary. As with other types of endovascular embolization procedures of the ECA territory (i.e., epistaxis), it is possible to encounter a situation where no definitive source of hemorrhage can be identified despite clinical evidence of continued bleeding. Delicate vascular irregularities such as spasm and vessel interruption, dense mucosal blush, and pseudoaneurysm should be regarded as potential sources of PTAH.

The case described here involves two potential sources for PTAH: a tonsillar artery pseudoaneurysm and ascending palatine artery irregularities [Figure 1A]. Different embolization agents are available

and include coils, PVA particles, and liquid agents. In this patient, the tonsillar pseudoaneurysm was treated by proximal coiling and the ascending palatine injury was treated with PVA particles. The optimal embolization agent depends on the specific situation and therapeutic objectives.

Endovascular treatment with an acceptable rate of complications is possible when performed by a team with experience in ECA embolization. Possible complications of the procedure include ischemic injury to mucosal surfaces and cranial nerves, inadvertent embolization of the ICA, induced vasospasm, and pain. Endovascular intervention in the setting of refractory PTAH will most likely prove to be an important and commonly used adjunct in the management of this potentially life-threatening complication.

Acknowledgement

The authors wish to thank Mrs. Shifra Fraifeld, a research associate in the

Departments of Radiology and Neurosurgery, for her editorial assistance in the preparation of this manuscript.

Correspondence

Dr. J.E. Cohen

Dept. of Neurosurgery, Hadassah-Hebrew University Medical Center, P.O. Box 12000, Jerusalem 91120, Israel

Phone: (972-2) 677-7092

email: jcohen@s@yahoo.com

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“Patriotism is combustible rubbish ready to the torch of any one ambitious to illuminate his name. In Dr. Johnson’s famous dictionary, patriotism is defined as the last resort of a scoundrel. With all due respect to an enlightened but inferior lexicographer I beg to submit it is the first”

Ambrose Bierce (1842-1914), American editorialist, journalist, short story writer and satirist