

Unusual Presentation of Traumatic Pseudoaneurysm of the Posterior Auricular Artery Manifesting by Massive Bleeding from the External Auditory Canal: A Case Report

Bartosz Sokol*, Katarzyna Stanislawska, Roman Jankowski, Włodzimierz Liebert and Robert Juszkat

Department and Clinic of Neurosurgery and Neurotraumatology, Poznan University of Medical, Poland

Abstract

Background: This report describes the unusual case of massive bleeding from the external auditory canal.

Results: We present a very rare mechanism of potentially fatal bleeding. We describe presentation, differential diagnosis, anatomy considerations and management options for this case.

Conclusions and relevance: Posttraumatic pseudoaneurysm is almost always a result of blunt trauma. When the pseudoaneurysm is bleeding, it requires urgent angiogram and occlusion.

Keywords: Posttraumatic aneurysm; Posterior auricular artery; Coil embolization

Background

To date only a few cases of posttraumatic pseudoaneurysm of the posterior auricular artery have been described [1,2] because they remain a rare entity [3,4]. We present posttraumatic pseudoaneurysm of the posterior auricular artery causing massive bleeding from the external auditory meatus successfully treated with endovascular coil embolization. Postembolisation digital subtraction angiography demonstrated complete exclusion of the pseudoaneurysm from circulation.

Case Report

We present a fifty-seven-year-old male was admitted to a maxillofacial ward two weeks after a motor vehicle car accident for the treatment of a mandible fracture by maxillofacial surgeons. Written informed consent was obtained from the patient for publication of this case report and any accompanying images. On admission he was alert and orientated. He had right sided facial weakness (House-Brackmann grade III). He had some blood-stained fluid discharge from the right external auditory meatus. A computed tomography (CT) scan of the head and neck were performed. There was no intracranial bleeding. There was no obvious skull base fracture but fluid within the petrous part of the temporal bone and right sided facial weakness suggested it [5]. A CT of the head also demonstrated fracture of the anterior and posterior walls of the maxillary sinus as well as fracture of the mandible. On the fourth day after admission he developed severe bleeding from the right external auditory meatus. A repeated CT scan of the head did not show any intracranial bleeding apart from the blood in the petrous bone. Ear, nose and throat examination demonstrated a ruptured tympanic membrane and bleeding from the middle ear. The bleeding was temporarily controlled with plugging of the external auditory canal. No obvious skull base fracture was demonstrated in the CT scan of the head (Figure 1). He had urgent angiography of the common, internal and external carotid arteries. The right femoral artery was punctured using the Seldinger method and a 6F vascular introducer was inserted (Balton, Warsaw, Poland). Selective angiogram of the external carotid artery demonstrated injury to the posterior auricular artery causing the formation of the pseudoaneurysm with dimensions of 29 mm and 22.5 mm. (Figure 2). The decision to embolize the distal segment of the posterior auricular artery was made. The guiding 6F catheter Casasco (Balt, Montmorency, France) was inserted into the trunk of the external carotid artery. Through it, the microcatheter Vasco 10 (Balt,

Montorency, France) was inserted into the target artery. There were six coils (Hydrogel Coils, MicroVention, USA) implanted into the posterior auricular artery trunk (Figure 3). The bleeding stopped immediately afterwards. The patient required transfusion of four units of blood but recovered well. Two days later he underwent surgical treatment of the fractured mandible and was discharged to the local hospital. He was readmitted seven months after treatment for a follow-up CT head scan with bone window and angiography. These demonstrated occlusions of the posterior auricular artery and no air within the right mastoid (Figure 4). He had right sided hearing loss with no facial weakness.

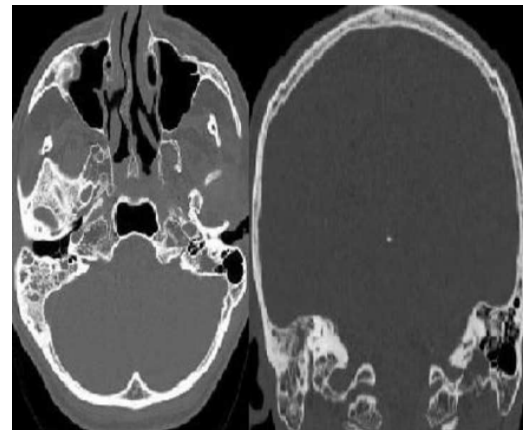


Figure 1: Initial CT scan of head demonstrating no obvious skull base fracture. There is apparent fluid in the right mastoid.

*Corresponding author: Bartosz Sokół, Department and Clinic of Neurosurgery and Neurotraumatology, Poznan University of Medical, Poland, Tel: 0048618691423; Fax: 0048618691430; E-mail: bartosz.sokol@ump.edu.pl

Received February 19, 2017; **Accepted** March 25, 2017; **Published** March 30, 2017

Citation: Sokol B, Stanislawska K, Jankowski R, Liebert W, Juszkat R (2017) Unusual Presentation of Traumatic Pseudoaneurysm of the Posterior Auricular Artery Manifesting by Massive Bleeding from the External Auditory Canal: A Case Report J Clin Case Rep 7: 937. doi: [10.4172/2165-7920.1000937](https://doi.org/10.4172/2165-7920.1000937)

Copyright: © 2017 Sokol B, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

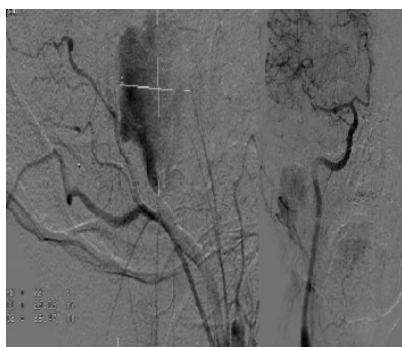


Figure 2: Digital subtraction angiography demonstrating anterior-posterior and lateral view of the pseudoaneurysm of the right posterior auricular artery.



Figure 3: Digital subtraction angiography demonstrating coiling of posterior auricular artery and occlusion of the pseudoaneurysm immediately after procedure.



Figure 4: Digital subtraction angiography demonstrating coiling of posterior auricular artery and occlusion of the pseudoaneurysm nine months after procedure.

Discussion

The posterior auricular artery arises towards the end of the external carotid artery and courses more superficially toward the outer orifice of the facial canal. It gives off four branches. Prior to the facial canal it gives off the auricular and cutaneous branches and near the stylomastoid foramen it gives off the stylomastoid and stylomuscular arteries. The posterior auricular artery, with the occipital artery, supply the posterior third of the scalp and are in hemodynamic balance [5]. The vertical part

of the facial nerve is supplied by the stylomastoid artery which lies on its anteromedial side as far as the upper third of the nerve. The artery then loops around the lateral or medial side of the nerve and divides into several branches. At the convex aspect of the genu, these branches anastomose with one another to form an arterial network, passing to the horizontal part [6]. All posttraumatic aneurysms are false aneurysms. Blunt force is the cause attributed in most cases where the small amount of underlying muscle tissue does not provide enough cushioning between vessel and bone [7]. It is also important to emphasise high-explosive military munitions used on battlefields which produce a variety of devastating injuries and are only rarely seen in civilian practices [8]. There are also cases of secondary infection and autoimmune disease, as well as cases of spontaneous aneurysms of idiopathic etiology [9]. Posttraumatic pseudoaneurysms can present as pulsatile scalp mass but it is important to emphasise that such presentation, i.e. massive or minor bleeding, or sudden-onset neck swelling, did not exist in our case [8]. The differential diagnosis should include dermoid or epidermoid cyst, eosinophilic granuloma, hematoma, abscess, aneurysm, arteriovenous fistula, encephalocele, lymphoid hyperplasia and sinus pericranii [9]. Diagnostic tools which can be used are duplex ultrasound showing fusiform dilation and turbulent intraluminal arterial flow in non-thrombosed aneurysms. CT angiography can provide important information on the vessel of origin, luminal morphology and relationship to adjacent osseous and soft tissue structures. Digital subtraction angiography is considered the gold standard for defining these lesions and differentiating them from arteriovenous malformations, which also present as pulsatile subcutaneous masses; however, it may be less useful in cases of thrombosed aneurysms [9]. First attempts at the treatment of pseudoaneurysms of the external carotid artery were performed by Hunter in the 18th century who showed the value of proximal artery ligation [10]. Treatment options for traumatic pseudoaneurysms include simple resection of the aneurysm, coil embolization [11] and direct thrombin injection [12], proximal ligation of parent artery or trapping of the aneurysm [13]. However, an open approach to many of these lesions may be fraught with peril due to grossly distorted and oedematous tissue planes that often have heavy bacterial colonisation [8]. In most cases, the use of endovascular techniques offers the most straightforward and low risk treatment option. Embolization of external carotid lesions, in particular, is a simple and effective procedure which eliminates the risk of delayed bleeding [8]. Aneurysms can be treated prophylactically when the patient is liable to experience further trauma, or when it may cause cosmetic problems. Our case is the first report of life-threatening bleeding from the external auditory meatus caused by the posterior auricular artery which was controlled by urgent embolization of the posterior auricular artery trunk. Traumatic aneurysms usually develop two to six weeks after blunt head trauma. Pseudoaneurysms are more common in the scalp and do not involve all layers of the arterial wall. We think that this aneurysm developed because of exposition of the artery during the injury, which had caused the skull base fracture. We suggest that blood from the ruptured pseudoaneurysm leaked through the fractured temporal bone to the middle ear and then to the external auditory canal via the ruptured tympanic membrane which was present upon initial examination.

Conclusion

Traumatic pseudoaneurysm of the posterior auricular artery is a rare consequence of craniocerebral trauma. We described unusual massive bleeding in the external auditory canal via ruptured tympanic

membrane. Artery coil embolization of the parent vessel is an effective method of treatment.

References

1. Archer SM, Jones RO (1992) Traumatic pseudoaneurysm of the posterior auricular artery. *South Med J* 85: 47-48.
2. Moon SM, Lee HK, Um CS, Kim CH, Koh YC, et al. (1997) Traumatic Pseudoaneurysm of the Right Posterior Auricular Artery. *J Korean Neurosurg Soc* 26: 1287-1291.
3. Campbell RG (2012) Sphenopalatine artery pseudoaneurysm after endoscopic sinus surgery: A case report and literature review. *Ear Nose Throat J* Feb 91: 4-11.
4. Maurizi M, Almadori G, Paludetti G, Ottaviani F, Loschi A (1985) Pseudo aneurysm of the external carotid artery: report of a case. *Int J Pediatr Otorhinolaryngol*. Mar 8: 263-269.
5. Lasjaunias P, Berenstein, Alejandro, ter Brugge K (2001) *Surgical Neuroangiography*. (2nd edn). Berlin-Heidelberg: Springer-Verlag 165-200.
6. Minatogawa T, Kumoi T, Hosomi H, Kokan T (1980) The blood supply of the facial nerve in the human temporal bone. *Auris Nasus Larynx*. 7: 7-18.
7. John N, Leach JL, Rachana T, Mangano FT (2009) Traumatic aneurysm of the occipital artery secondary to paintball injury. *Clin Neurol Neurosurg*. 111: 105-108.
8. Cox MW, Whittaker DR, Martinez C, Fox CJ, Feuerstein IM, et al. (2007) Traumatic pseudoaneurysms of the head and neck: Early endovascular intervention. *J Vasc Surg* 46: 1227-1233.
9. Rao VY, Hwang SW, Adesina AM, Jea A (2012) Thrombosed traumatic aneurysm of the occipital artery: A case report and review of the literature. *J Med Case Rep* 6: 203.
10. Boles DM, van Dellen JR, van den Heever CM, Lipschitz R (1977) Traumatic aneurysms of the superficial temporal and occipital arteries: Case reports and review. *S Afr Med J* 51: 313-314.
11. Cvetic VZ, Radmili O, Lukic B, Colic M, Davidovic L (2016) Endovascular treatment of traumatic pseudoaneurysm of the superficial temporal artery. *Vasc Endovascular Surg*. 50: 171-174.
12. Thomassen I, Klompenhouwer EG, Willigendael EM, Teijink JAW (2014) Treatment of temporal artery pseudoaneurysms. *Vascular* Aug 22: 274-279.
13. Rancic Z, Pecoraro F, Nigro G, Simon R, Frauenfelder T, et al. (2014) Branch ligatures and blood aspiration for post-traumatic superficial temporal artery pseudoaneurysm: Surgical technique. *Gen Thorac Cardiovasc Surg*. 62: 68-70.