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Opinion

Nasal Bleeding – Don´t Forget Your Interventional Radiologist

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Abstract

Nasal bleeding is a common condition and if treatment is necessary at all treated successfully by the otolaryngologist. In some patients however treatment is not possible by the otolaryngologist alone. In these cases, interventional radiology provides a safe and highly successful treatment option.

Keywords: Nasal bleeding; epistaxis; interventional radiology

Opinion

Nasal bleeding is a common condition and in most of the cases self-limiting. Thus, most patient don´t see a family doctor and even less an otolaryngologist. Besides that, epistaxis is still one of the most common reasons for emergency consultations in ENT-Departments because of its high prevalence in the population. In most of cases the patients are treated successfully by the otolaryngologist. Soyka et al. reported that in 678 cases only one could not be solved by otolaryngologists and required treatment by interventional radiology [1]. A second patient group potentially requiring interventional procedures are patients with ENT-malignancies or illnesses making them vulnerable to blood loss e.g., continuous anticoagulation, hematological malignancies and others. For these cases a close cooperation between otolaryngologists and interventional radiologists is crucial to provide optimal care.

For the success of interventional radiology treatment optimal planning is necessary. Hence, for all patients computed tomographic (CT) or magnetic resonance (MR) imaging with CT- or MR-angiography should be obtained if possible. The application of contrast media is mandatory to rule out severe causes of epistaxis like underlying malignancy or high collateralization between the branches of the external carotid artery and intercranial vessels. The concerns about potential kidney injury have been weakened in the last years because of the work of McDonald et al. [2] and the recent guideline of the European Society of Urogenital Radiology [3]. These stating that contrast-media induced kidney disease is significantly less frequent than formerly thought and the risk of kidney failure is negligible down to an estimated glomerular filtration rate (eGFR) of 30 ml/min/1,73 m2. Other adverse reactions like severe allergoid reactions or hyperthyroidism to contrast media are also exceptional. Furthermore, exact clinical information about the laterality of bleeding, the conducted therapeutic steps until the time of intervention and the assumed cause of bleeding are critical.

In the angiography suite the procedure is typically carried out via a common femoral artery access under local anesthesia. General anesthesia or intubation may only be necessary for patient requirements e.g., in critical ill patients. In some cases, an access via the radial or brachial artery may be used. After puncture of the artery in modified Seldinger technique and placement of an

introducer sheath the guiding catheter and guiding wire are placed in the common carotid artery first and then in the internal and external carotid artery on the side of bleeding. Digital subtraction angiographies (DSA) are carried out in at least two planes to detect the site of bleeding and hazardous anastomoses to the circulation of the brain if present. If nasal packing has been used to control the bleeding it can be necessary to remove the packing to make the pathology visible on DSA imaging. The next step is to place a microcatheter using a micro-guidewire in the vessel maintaining the bleeding. In our institution we use 2.8 French (F) microcatheters as standard devices but microcatheters as small as 1.9 F are available for very small vessels. After reaching the intended vessel and verifying the correct position of the catheter by DSA there

are several options to occlude the vessel. For bleedings that are maintained by only one distinctive vessel coil-embolization is the method of choice. For bleedings without distinctive vessel or when only an area of pathologic vessels is found particle-embolization with poly-vinyl-alcohol (PVA) particles should be used. Alternatively, a slurry of gelatin-particles is also an option and has the potential advantage of recanalization of the vessel over time due to the biodegradation of the gelatin in the body. In cases of extensive bleeding e.g., because of malignancy or vascular malformation the embolization of the external carotid artery of one or even both sides can be necessary and is best carried out with volume-coils or vascular-plugs. Seldom a covered stent-graft is placed from the common in the internal carotid artery to exclude the external carotid artery from blood flow and at the same time secure the blood flow to the brain in the case of tumor-invasion in the carotid bifurcation. The use of glue or other liquid embolic agents is possible but, in our experience, not the first choice. Due to many collaterals between the external carotid artery on both sides an angiogram of the contralateral side should be obtained before ending the procedure to rule out a second source of bleeding. After the removal of the materials the puncture site is closed with a closure system to reduce the risk of complications and the patients time in compressor dressing and bed rest.

The interventional procedures are safe with severe complications below 1% and have a high rate of success up to 95% if carried out by qualified and experienced personnel in more recent studies mostly because of better materials [4]. Due to the many collaterals between the external carotid artery and the brain accidental spread of embolic agents (mostly PVA-particles or liquid embolic agents) in the circulation of the brain or the ophthalmic artery is a feared complication. Those result in minor or even major stroke and blindness. Further there can be necrosis due to extensive embolization with particles or liquids. Complications on the site of arterial puncture are mostly hematoma and pseudo-aneurysm. These can be treated conservative and require surgery only in exceptional cases. The recurrence rate of bleeding is comparable to endo-nasal surgery. In conclusion the otolaryngologist should think of the option of interventional radiology when treating a challenging nasal bleeding. In the rare cases of non- treatable bleeding interventional radiology offers an excellent option for successful bleeding control with high patient comfort and a low rate of adverse events.

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