Embolization with “Ethibloc” of Vascular Tumors and Arteriovenous Malformations in the Head and Neck*

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Summary. “Ethibloc” has been used almost exclusively until now for embolization of tumors and bleeding vessels in the liver and kidney. Unlike with Gelfoam-particles, there is no recanalization. The resorption occurs so slowly that there is no interference with the necrosis of the embolized tumor. Due to its low viscosity, it passes catheters with thin lumina and fills the capillary bed of the tumor without danger of reaching the venous vessels. In this paper we describe a new technic of percutaneous catheter-embolization with Ethibloc using a coaxial catheter which we believe enhances safety and effectiveness. It has been successfully used in five patients. In the meantime two more patients have been treated successfully.

Key words: Embolization – Ethibloc – Coaxial catheter system – Head and neck

Transcatheter embolization for the treatment of arteriovenous malformations and tumors has become an established practice in neuroradiology. Two indications have developed:

1. Presurgical devascularisation of tumors or surgically accessible arteriovenous malformations.
2. Palliative treatment of either inoperable lesions or lesions with high surgical risks.

In the preoperative occlusion-therapy Gelfoam-particles have proved useful as they can be handled relatively easily and safely. A drawback of the medium is its inability to reach the capillary bed of the lesions [1, 2]. A prerequisite for permanent therapeutic success with a substance is that it cannot be recanalized and that it propagates peripherally into the feeding vessels of the tumor or the arterio-venous malformation, thus leading to necrosis and as far as possible preventing a recurrence via collaterals.

Experimental [1, 2] and clinical [3] investigations on the effectiveness of the available embolizing agents showed that Ethibloc very well fulfills the requirements for lasting and peripheral occlusion. The substance consists of an alcoholic (60%) solution of zein (corn-protein). The active part, the zein, is water-insoluble and immediately precipitates in aqueous media as a cast (blood, contrast material, sodium chloride solution). The alcohol dissolves in the aqueous part of the blood. The speed of precipitation can be delayed by a preliminary injection of glucose because of its high osmotic strength. Ethibloc, as a liquid substance, has not until now been used in the head as it cannot be applied in such precise quantities as the particles of Gelfoam and silicon spheres. There is thus a danger of reflux into other areas of the vascular tree. To achieve a high degree of safety when injecting the substance we developed a new technic of embolization through a coaxial catheter system. In this way the risks of reflux, of obstruction of the catheter and of an adhesion of its tip at the vessel wall are greatly reduced.

Material and Method

Embolization is usually performed under local anaesthesia by the transfemoral or transaxillary route. We prefer a thin polyethylene catheter (e.g. Becton-Dickensen, ID 1.15, OD 1.65 mm). The tip of the catheter can easily be preformed according to the vessel anatomy. Following selective catheterisation a

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**Fig. 1a and b.** Case 1. a Selective injection of the left maxillary artery. Opacification of an angioma below the base of the skull. b Following embolization with Ethibloc the pathologic vessels are selectively occluded.

**Fig. 2a and b.** Case 2. a Dural arterio-venous fistula between the retroauricular branch of the occipital artery and the transverse sinus. b Following embolization, complete occlusion of the fistula.