



“Microvascular Plug (MVP) device for endovascular embolization of hypervascular tumors of the head and neck, spinal tumors and meningiomas.”

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Introduction

The Microvascular Plug (MVP) system (Reverse Medical Corporation, Irvine, CA) is a self-expanding and fully retrievable device made of nitinol and a polytetrafluoroethylene (PTFE) cover. The MVP is detached by electrolytic means. It is indicated to obstruct blood flow in the peripheral vasculature and not intended for intracranial vessels at this time. This is the first device developed for parent vessel occlusion since detachable balloons were discontinued. Resection of hypervascular tumors can be hampered by hemorrhagic complications. Pre-operative embolization of hypervascular tumors of the head and neck, spinal tumors, and meningiomas is beneficial as long as the risk of the procedure is negligible.

Methods

From September 2013 to January 2014, a total of 6 patients underwent embolization of hypervascular tumors (3 meningiomas, 1 nasopharyngeal tumor, 2 spinal tumors) with Embospheres 100-300 microns, followed by deployment of MVP device into the parent feeding artery through 0.021 microcatheters.

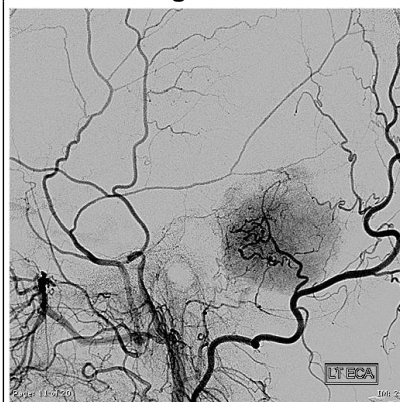
Results

There was immediate complete obliteration of the parent vessel upon single device deployment from the microcatheter (Figure 1). There were no failures of detachment. Five of the patients underwent resection of the embolized tumors one day after without complications. The intravascular device didn't interfere with the resection as documented on Figure 2. Patient 6 (nasopharyngeal tumor) was determined to be high risk for surgery and was referred for radiation therapy (Figure 3). There were no immediate or delayed ischemic, hemorrhagic, or device related complications.

Conclusions

The use of the MVP device for endovascular embolization of hypervascular tumors of the head and neck, spinal tumors and meningiomas is safe and effective. Given that only one device is necessary for complete vessel occlusion and the ease of use, we believe that this device should be studied in the intracranial vasculature for parent vessel occlusion, aneurysm and AVM management. The Uno system (Reverse Medical Corporation, Irvine, CA) for intracranial embolization is pending FDA approval. MVP is a safe and durable option of parent vessel occlusion.

Figure 1A



Hypervascular tumor blush with supply from trans mastoid branch of the occipital artery.

Figure 1B



External carotid artery contrast injection after embolization with Embospheres and deployment of MVP device in the occipital artery.

Figure 2



MVP device inside the superficial temporal artery in patient undergoing resection of hypervascular meningioma status post embolization.

Figure 3A



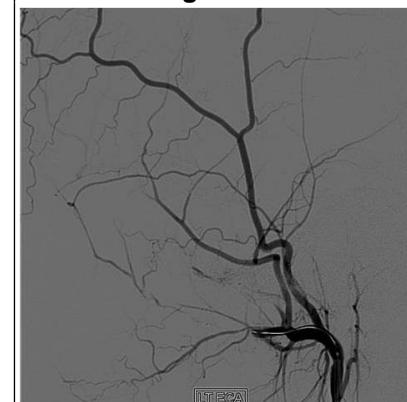
ECA injection demonstrating hypervascular nasopharyngeal tumor blush with supply from accessory meningeal artery and very small branches off the IMAx after previous ligation of sphenopalatine arteries.

Figure 3B



ECA injection status post embolization of accessory meningeal artery with Embospheres. There is residual blush from very small branches off the IMAx.

Figure 3C



ECA contrast injection with MVP deployed in IMAx. There is no residual tumor blush.