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Balloon angioplasty without a guide wire in treating clinical vasospasm due to aneurysmal subarachnoid hemorrhage. The ‘pop off valve’ technique

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Introduction

Endovascular treatment of cerebral vasospasm following aneurysmal SAH remains a therapeutic challenge. Presently, balloon angioplasty for cerebral vasospasm is often performed using compliant balloons with a guide wire in place for inflation. Some endovascular specialists are reluctant to perform balloon angioplasty routinely for fear of unpredictable balloon inflation and vessel rupture in severe vasospasm. We present a safe and effective technique for balloon angioplasty in vasospasm.

Methods

All patients who underwent balloon angioplasty for symptomatic vasospasm from aneurysmal SAH during September 2010 - August 2013 were included in the study. Of 62 patients that underwent endovascular treatment for vasospasm, 41 patients were treated by balloon angioplasty in 54 vessel segments. Angioplasty was performed by providing sufficient pressure to inflate the Hyperform balloon (EV3) with a 1cc syringe without the wire in situ. Gentle sequential dilations of the affected segment were performed. In severe vasospasm contrast ‘pops off’ from the distal balloon catheter when sufficient pressure is reached on injection/inflation. This acts as a safety ‘pop off valve’ to prevent vessel rupture as the vessel is slowly dilated. Twenty two patients required repeat procedures for clinical response. Patients were followed until discharge.

Learning Objectives

Using the Hyperform balloon for angioplasty with the ‘pop off valve’ technique for treating vasospasm is a safe and effective technique.

Results

Angiographic response was excellent in all vessels treated. Of 41 patients, good clinical response was seen in 19 patients after first angioplasty. Sixteen patients required two angioplasties for a clinical response. Eight patients did not respond to multiple angioplasties and developed infarcts in the corresponding vascular territory. There were 5 deaths in the series. None of the patients developed complications directly related to balloon angioplasty.

Conclusions

Balloon angioplasty for treating cerebral vasospasm in aneurysmal SAH using the Hyperform balloon (EV3) with the ‘pop off valve’ technique without a guidewire is both effective and safe.

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