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Biaxial versus Triaxial Catheter Systems for Deployment of Pipeline Embolization Device: A Comparative Study

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Introduction

This study compared the use of biaxial and triaxial catheter systems for deployment of Pipeline embolization devices (PEDs; Medtronic) in patients with intracranial aneurysms (IA).

Methods

A retrospective study of patients undergoing PED deployment with biaxial or triaxial catheter systems between 2014 and 2016 is presented. The choice of catheter systems was based on surgeon's preference. Patients who received multiple PEDs or adjunctive coils were excluded. The 2 catheter system groups were compared for clinical characteristics, procedure time, fluoroscopy time, radiation exposure (to the patient), periprocedure complications (transient or permanent thromboembolic, hemorrhagic, or other) and functional outcomes. Statistical analysis was performed.

Results

Seventy-nine patients with 86 IAs treated with 79 PED deployment procedures at our institution met the study criteria. Forty-six cases of PED deployment were done using a biaxial catheter system; a triaxial catheter system was used in 33 cases. The time (min.) of guide catheter placement to PED deployment was significantly shorter in the biaxial group (22.82±19.24 vs. 38.43±31.08, p=0.006) as was the fluoroscopy time (28.83±23.00 vs. 50.34±27.07, p=0.001). Patient radiation skin exposure (mGy) in the biaxial group compared to the triaxial group was less (1243.744±808.23 vs. 2074.60±1505.64, p=0.003). There was not a statistically significant difference in transient and permanent complications or modified Rankin Scale scores at 30-day follow-up. Only 2 cases required conversion from a biaxial to a triaxial system and that was due to anatomical challenges.

Conclusions

In the hands of experienced neurointerventionists, the use of a biaxial catheter system for the deployment of PED shortens procedure and fluoroscopy time and decreases radiation exposure compared to the use of a triaxial catheter system. The use of the biaxial versus the triaxial catheter system did not result in a significant difference in the rate of complications.

Learning Objectives

Comparison of the safety and efficiency of the two catheter systems (biaxial versus triaxial) when used for the deployment of PED

References

Available up on request.

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