Strategy-Specific Complication Phenotypes in Ophthalmic-Segment ICA Aneurysms: A Three-Patient Case Series Across Flow Diversion (SAC to FDS) and Primary Coiling

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I. Background

Ophthalmic-segment internal carotid artery aneurysms (ICA-OphA) present unique therapeutic challenges given factors like their location, variable rupture status, and propensity for treatment-related complications. In fact, despite innovations in endovascular therapy—flow-diversion stents (FDS), stent-assisted coiling (SAC), and primary coiling—inter-patient complication profiles differ considerably[1].

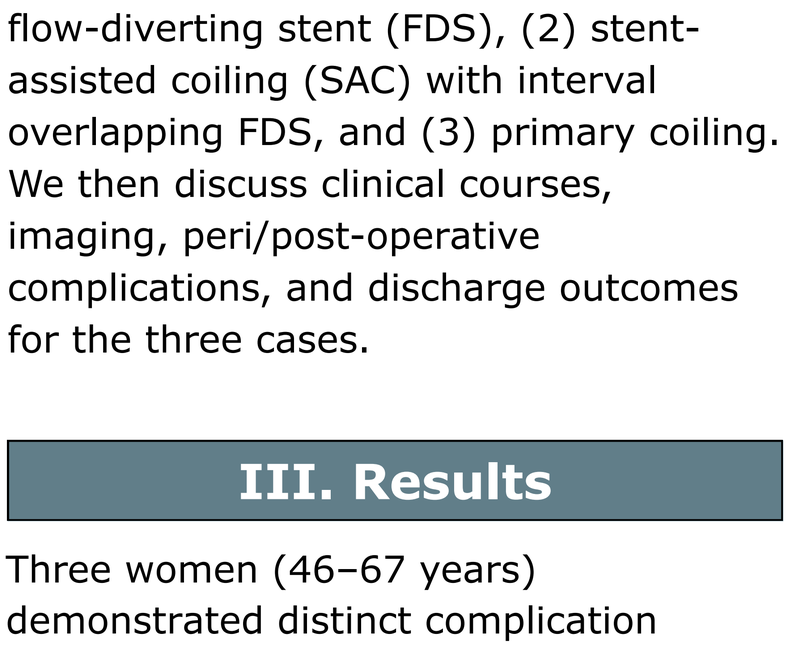
Objective: To describe strategy-specific complication phenotypes and early outcomes in three women with ICA–OphA aneurysms treated with (1) flow-diverting stent (FDS), (2) stent-assisted coiling with interval overlapping FDS (SAC→FDS), and (3) primary coiling.

II. Methods

This series is a retrospective review of three females (46–67 y) with ICA-OphA aneurysms treated by the following: (1) flow-diverting stent (FDS), (2) stent-assisted coiling (SAC) with interval overlapping FDS, and (3) primary coiling. We then discuss clinical courses, imaging, peri/post-operative complications, and discharge outcomes for the three cases.

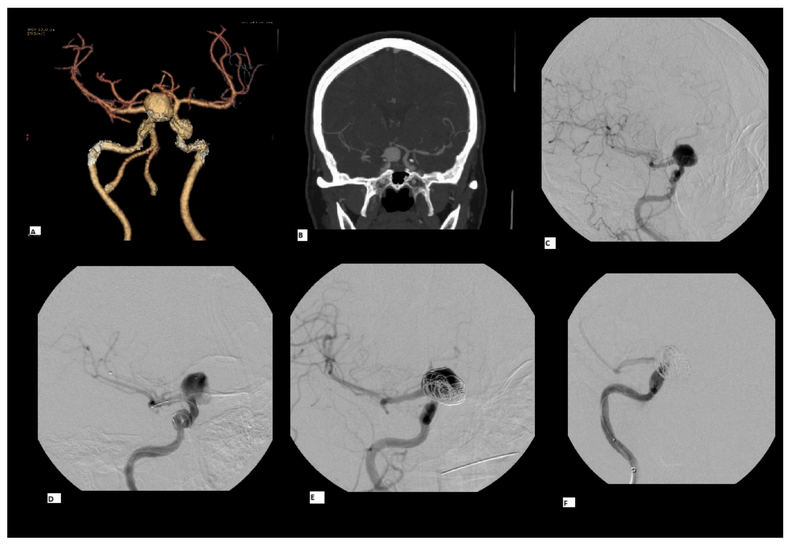
III. Results

Three women (46–67 years) demonstrated distinct complication phenotypes by treatment strategy.



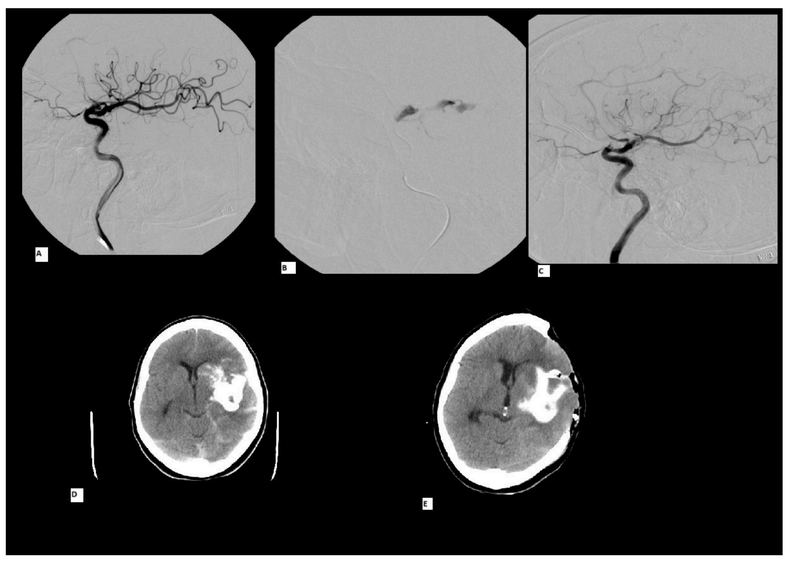
Case 1 (FDS; ruptured; Fisher 3; 7×9 mm):

After DAPT loading and FDS placement, the patient developed delayed in-stent thrombosis with ICA occlusion and large hemispheric infarction requiring decompressive hemicraniectomy. Discharged with persistent hemiplegia.



Case 2 (SAC→FDS; unruptured; 12×8 mm):

Presented with monocular vision loss. Initial SAC (with WEB device) was followed by interval aneurysm regrowth at 6 months, prompting treatment with an overlapping FDS. Six-month post-FDS angiography demonstrated complete occlusion with stable vision.



Case 3 (Primary coiling; ruptured; Fisher 2; 4×9 mm):

Intra-procedural rupture occurred during catheterization and was managed with rapid coil occlusion. Post-procedure imaging showed focal intracerebral hemorrhage. Discharged GCS 15 with persistent aphasia and residual unilateral neurologic deficit (motor and/or sensory).

IV. Conclusions

Across three strategies, distinct complication phenotypes were observed: delayed thromboembolism after FDS, interval regrowth after SAC requiring definitive FDS, and intraprocedural rupture with primary coiling. Recognizing these patterned risks can inform strategy selection, antiplatelet planning/monitoring, surveillance timing, and patient counseling for ophthalmic-segment aneurysms.

V. Learning Points

- Technique matters:
  - FDS—watch for delayed thrombotic events
  - SAC—plan follow-up for regrowth
  - primary coiling—highest intraprocedural rupture risk.
- Surveillance should match strategy: early imaging for thrombotic complications after FDS; 3–6 mo angiography after SAC to detect recurrence.
- Optimize antiplatelet/ anticoagulation protocols and platelet-function testing when using FDS.
- Document Raymond–Roy class and neurologic outcomes to correlate mechanism and prognosis.

VI. References

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