Endovascular coiling of anterior communicating artery aneurysms: a review of preliminary clinical and angiographic outcomes

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INTRODUCTION

• One of the most common aneurysm locations

• Complex anatomic variants within Acomm complex

• Mortality rates with surgery 6-30% depending on presentation Hunt-Hess grade
Normal anatomy

Dominant left A-1

Three small Acomms

Perlmutter and Rhoton, J Neurosurg, Sept 1976
Double Acomms

Double Acomms and double recurrences on right

Multichanneled Acomm
Dominant right A1

Triple A2 segments

Tortuous A1 segments
METHODS

• Retrospective review of 69 attempt to treat patients with 65 undergoing 67 endovascular GDC coiling procedures
  – Demographics
  – Size
  – Rupture status
  – Hunt-Hess/Fisher grades
  – Glasgow outcome scores
  – Angiographic outcomes
DEMOGRAPHICS

• Average age: 60 years old (range 26-85)
• Average size: 6.3 mm (range 2-12 mm)
• Male:Female ratio 27:38
• Ruptured:Unruptured ratio 57:8
• 4 technical failures
  – 3 unable to catheterize, 1 neck too wide
Follow-up

• 65 patients that underwent coiling were followed
  – 32 had repeat angiography with average f/u 10 mos. (82% of eligible patients)
  – Reasons for ineligibility or no follow-up were:
    • 7 patients lost to f/u
    • 19 patients died before f/u
    • 7 patients had procedure within last 6 months and are awaiting scheduled f/u
RESULTS

- Overall
  - 63% improved or remained stable
  - 6% worsened
  - 31% died

- Crossover to surgery in 3%
  - 1 coil compaction, 1 coil occluding parent vessel

- Outcomes dependent upon clinical grade at admission
  - Poor grade patients (HH 4-5) had a 60% mortality rate

- Causes of death (n=20):
  - Sepsis 4
  - Rebleed 1
  - MI 2
  - Brain death 13 (Vasospasm 5, WOS 6, Infarct 2)
## Clinical Outcomes

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Complications (n=13)

- **Coil herniation with infarct**: 1 (1.5%)
- **Intraoperative rupture**: 5 (7.5%)
  - 1 patient had infarct due to coil herniation
- **Embolus**: 3 (4.5%)
  - All 3 had deficits, 1 with infarct leading to brain death and withdrawal of care
- **Vessel dissection**: 2 (3%)
  - 1 with hemiparesis
- **Rebleed**: 2 (3%)
  - One patient was HH 5 and had IVH following placement of ICP bolt monitor, while the other patient with known residual neck presented as HH 5 and family withdrew care
- **Neurological morbidity** (7.5%) and **mortality** (4.5%)
# Angiographic outcomes

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<th>Immediate post-coiling (n=65)</th>
<th>Follow-up (mean 10m) (n=32)</th>
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<td>Complete occlusion</td>
<td>47 (72%)</td>
<td>25 (78%) *</td>
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<td>Partial occlusion</td>
<td>15 (23%)</td>
<td>5 (16%)</td>
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<td>Incomplete occlusion</td>
<td>3 (5%)</td>
<td>2 (6%)</td>
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Coil compaction: 6 (19%)—2 recoiled, 1 clipped, 1 rebleed caused fatal SAH, 2 being observed

Thrombosis to complete occlusion: 4 (13%)
Summary

- N=69 w/ 65 treated with embolization
- Clinical Results
  - 63% improved or had no change
  - 6% worsened
  - 31% died
- Procedure Related Neurologic Morbidity 7.5%
  - 6% permanent
  - 1.5% temporary
- Procedure Related Mortality 4.5%
- Technical Outcomes
  - 78% complete
  - 16% partial
  - 6% incomplete
  - 3% crossover
  - 3% rebleed—one of these is not clearly aneurysmal rebleed
  - 6% unable to coil
Conclusion

• Endovascular therapy for A comm aneurysms is safe and effective
• Long term follow-up will be needed to determine long term effectiveness
• Complicated A comm anatomy and broad based nature of the lesion rarely affects ability to embolize
• Absent A1 segment is a reason for concern but not an absolute contraindication to endovascular therapy