PFO: Should we close them?

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PFO: Should we close them?

Sometimes....
Patent Foramen Ovale: What is it?

- **Residua of fetal life**
  - Oxygenated blood from IVC provides systemic circulation.

- **Primum and secundum tissue overlap fails to seal completely**
  - *Intermittent* right to left shunting
PFO: how common is it?

**Incidence of PFO**

Autopsy study of 965 normal hearts:

- 27% overall
- 34% age 0-30,
- 25% age 30-70,
- 20% age 70-90
  - Diameter mean=4.9mm,
  - 98% 1-10mm
  - Mayo Clin Proc ’84
PFO: potential clinical manifestations

- Cryptogenic stroke
  - Embolic w/o source
- Migraines
  - Conflicting association
- Scuba Divers
  - Decompression sickness
  - 2-5x OR increase
- Platypnea-orthodeoxia
  - Orthostatic increase in shunt and hypoxia
- Paradoxical embolism
### PFO: What’s the relationship to "cryptogenic" stroke

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<tr>
<th></th>
<th>Cryptogenic Stroke</th>
<th>Control</th>
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<td>Lechat 1988</td>
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PFO: What’s the relationship to "cryptogenic" stroke
PFO: What’s the relationship with migraines

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PFO: How do you diagnose it?

TTE “bubble study”:
Agitated iv saline injection

TEE demonstrating LA to RA flow through PFO
PFO and CVA

**TEE characteristics of increased risk**

- **PFO size >4mm**
  - Am J Med ‘00

- **Significant resting shunt**

- **High mobility of the overlap**

- **Study of 350pts with CVA/TIA**
  - 29% with shunt by TEE/contrast and 25% cryptogenic
  - Recurrent events at mean 31 mos: 4.3% lowrisk PFO, 12.5% highrisk PFO, 16.3% for cryptogenic
  - De Casto, Stroke ‘00
PFO and ASA

Atrial Septal Aneurysm

- Definition: redundant, hypermobile atrial septum
  - Prevalence: 1% autopsy, 4% TEE, 5% CV surgery
- 10% of unselected pts, 28% of pts with stroke
  - TEE Study: 100 with CVA, 50 nmls: Stroke ’93
    - ASA OR=4.3 (1.3-14.6)
    - PFO OR=3.9 (1.5-10)
    - Both OR=33 (4.1-270)
  - Meta-analysis pts<55yrs, Neurology ’00
    - ASA OR=3.1 (2.3-4.2)
    - PFO OR=6.1 (2.5-15.2)
    - Both OR=15.6 (2.8-85.9)
Recurrent Cerebrovascular Events with:

- PFO
- ASA
- Both

PFO: We CAN close them!
Amplatzer PFO closure:

18mm left disc opened
Closure Device Complications

**Thrombus Formation:**

- 1,000 consecutive pts, PFO (593) ASD (407)
- ’92-03, Age 48yrs (13-90)
- 70% with TEE, 14/20 at 4wks
- 1.2% ASD, 2.5% PFO
  - 7% Cardioseal (27), 0.3% for amplatzer (418)
  - Etiology: AF (4) and ASA(4) and cl dz (2)
  - 17/20 tx with hep/coumadin, 3 tx surgery
    - Sievert J ACC ‘04
PFO and stroke: What do consensus documents recommend?

**Treatment:**

- **8th ACCP Recommendations: Chest ’08**
  - First embolism/TIA: long-term anticoagulation
    - coumadin if venous thrombosis
  - Failure of anticoagulation: closure/excision

- **AAN 2004**
  - Based on prospective PICCS and Mas
  - PFO alone, NOT increased risk for recurrent cryptogenic
  - ASA alone, insufficient data
  - PFO & ASA, possible increased risk in pts <55

- **AHA/ASA/ACC Stroke ‘06**
  - Closure for failure of treatment
  - FDA withdrew approved devices ‘06
PFO: Should we close them?

► Most are incidental, NO workup required
► Cryptogenic stroke patients < 55yrs old
  ▪ NO First event:
    ▶ ENROLL in randomized trials
  ▪ YES, Second event
    ▶ Follow expert consensus guidelines
► Migraines
  ▪ No, consider enrollment in randomized trials
► Divers: Yes
► Orthodeoxy-platypnea: Yes