Status Of Left Atrial Appendage Exclusion (Endo And Open) For Stroke Prevention With Atrial Fibrillation: Techniques And Results

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Left atrial appendage (LAA) is the source of thrombus in over 90% of AF patients

LAA exclusion: Implications in the US

- All Strokes (100%)
  - 80% Ischemic
  - 20% are Associated with AF
  - 95% have LAA Thrombi

= 130,000 strokes / year

LAA closure: Growing indication!

N=10 patients in Sinus Rhythm
OPCAB, PVI & LAA Clip
Intraoperative Testing
(before/after Clipping)

LAA exclusion reduces AF!
Its for two crucial reasons

- Prevent stroke!
- Electric isolation

LAA Exclusion in Surgical Pts

- 75782 patients (5% underwent surgical LAA exclusion)
- Primary endpoint: ischemic stroke, systemic embolization, death
- Less stroke (1.11 vs 1.71 per 100 person-years) p 0.01
- Less mortality (3.22 vs 4.93 per 100 person-years) p 0.001
- ATLAS trial pending

Summary of LAA Closure Devices

- **ENDOCARDIAL** Devices:
  - Watchman - Percutaneous
  - Amplatzer - Percutaneous

- **EPICARDIAL** Devices:
  - Lariat - Percutaneous
  - AtriClip - Surgical

Percutaneous Devices

Watchman/Watchman FLX

- 14F
- 5 sizes
- 10-20% oversized Parachute
- Self-expanding
- 10 barbs

- Foreign body remains inside LA
- Approved by FDA 3/13/15
- CE approved

Watchman: Treatment Failures

\[ \text{Meta-analysis at 4-year } \text{f/u: prevention of ischemic stroke and systemic embolism similar to coumadin, with reductions in major bleeding (ie, hemorrhagic, disabling/fatal stroke) and mortality} \]


Reddy VY, et al. 5-year outcomes after left atrial appendage closure: from the PREVAIL and PROTECT AF trails. Am Coll Cardiol. 2017;70:2964-2975
Watchman leak size

Percutaneous Devices

Amplatzer ACP and Amulet Device
- 9-14F device
- Nitinol self-expanding
- 8 sizes
- ENDOCARDIAL
- No randomized trials
- Foreign body remains inside LA
- Still unapproved in US
- Available OUS, CE approved

Percutaneous Devices

WaveCrest, Occulotech, LAmbre
- ENDOCARDIAL
- No randomized trials
- Foreign body remains inside LA
- Still unapproved in US
- Available OUS, CE approved

Leaks – “Edge Effect”

Leaks – “Gunnysack Effect”

Percutaneous Devices

LARIAT
- Complications:
  - 3.4 pericardial tamponade
  - 1.3% major bleeding
  - 0.5% arterial injury
  - 0.1% death
- EPICARDIAL/Endocardial access
- No randomized trials
- No foreign body remains in LA
- Approved in US (510k)
- Available OUS
Lariat: Treatment Failures

Bartus et al., Journal of the American College of Cardiology 2012

Issues with Surgical Closure

Kanederian et al., JACC 2008

Circular closure: a No No!

Concomitant ligation in permanent AF
- Endoloop® in 12 concomitant cases
- TEE and pre-discharge CT
- At 3 month FU: 75% perfused on CT

Surgical Devices

AtriClip

EPICARDIAL
- Can be repositioned
- Approved in US
- Available OUS

Virtually no leaks or residual pouches

The Surgical AtriClip

AtriClip
Thoracoscopic exclusion

AtriClip: Prospective Device Trial

AtriClip Midterm Safety Trial

1 TIA during FU

No stump > 1.5cm in any patients

3rd International Symposium on Left Atrial Appendage
Los Angeles, February 6-7 2015

Consensus

• The primary efficacy of Watchman device is comparable to oral Warfarin therapy.
• One-third of Watchman devices have a leak > 5mm.
• Leak rates are lower with the AtriClip and LARIAT (Epicardial devices).
• Leak rates are less severe (< 1mm) with the AtriClip and LARIAT (Epicardial devices).

LAA closure - after thoughts!

- 100% LAA closure or removal is mandatory
- Important concept for permanent AF patients
- Effective in stroke reduction in midterm f/u
- Epicardial closure is safe, effective and durable
- Endocardial closure is least-invasive but challenging
- Pricing crucial for Clinical adoption!!
- Heart-team approach can take away specialty bias
Thank you!