

ACADEMIA SBCCV



Curso de Cirurgia Minimamente Invasiva da SBCCV



DATA: 25 e 26 de outubro de 2018

LOCAL: Hotel Tryp Paulista

Rua Haddock Lobo, 294, Cerqueira César, São Paulo



Curso de Cirurgia Minimamente Invasiva da SBCCV

DATA: 25 e 26 de outubro de 2018

LOCAL: Hotel Tryp Paulista



Módulo: Fibrilação Atrial

O Que Fazer com o Apêndice Atrial Esquerdo

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Professor Titular de Cirurgia da UFCSPA
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Declaração de Potencial Conflito de Interesse

Nome do Palestrante:

Renato A. K. Kalil

Título da Apresentação:

Módulo: Fibrilação Atrial

O Que Fazer com o Apêndice Atrial Esquerdo

Não possuo nenhum conflito de interesse relacionado a esta apresentação

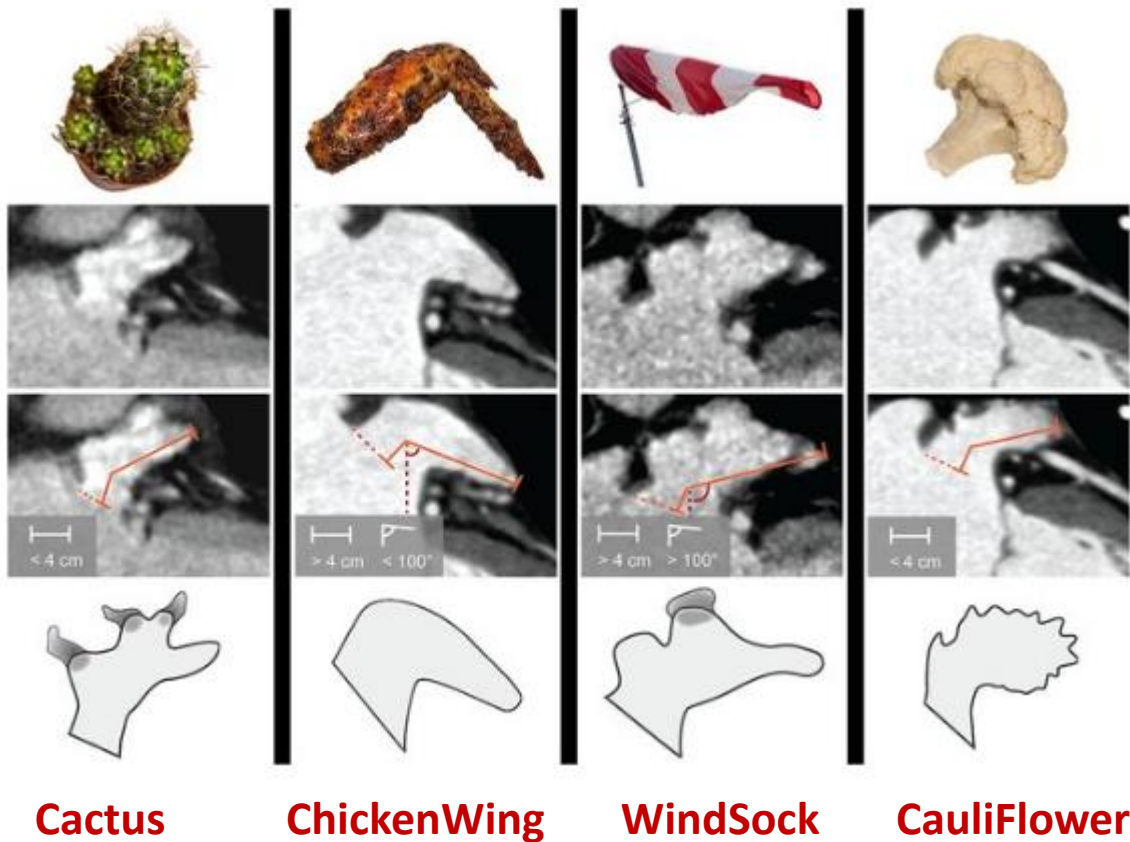
O Que Fazer com o Apêndice Atrial Esquerdo

- *Em FA Primária (não associada a doença estrutural): ressecção ou exclusão como parte do procedimento*
- *Em cirurgias estruturais, sem FA: como profilaxia de tromboembolismo por FA p.o.*
- *Em cirurgias estruturais com FA paroxística: como tratamento e prevenção de tromboembolismos tardios*
- *Em cirurgias estruturais com FA permanente: para exclusão de trombos e profilaxia p.o. imediata e tardia*
- *Em MICS*
Com dispositivos ou ressecção

O Que Fazer com o Apêndice Atrial Esquerdo

- ***Critério de sucesso na exclusão de AAE:***

Ausência de fluxo na cavidade excluída ou ausência de cavidade (na ressecção) e coto residual menor de 1 cm em profundidade



Figure

Recommend

Comment

Caption

Fig 1. LAA morphology types based on Wang's classification with Kimura's quantitative limits. LAA length was measured from the orifice area (dashed orange line) to the farthest point of the LAA via the center of the main lobe. The bend angle was measured with an imaginary vertical line (red dashed line) and a line between the main lobe and the farthest point of... [Read more](#)

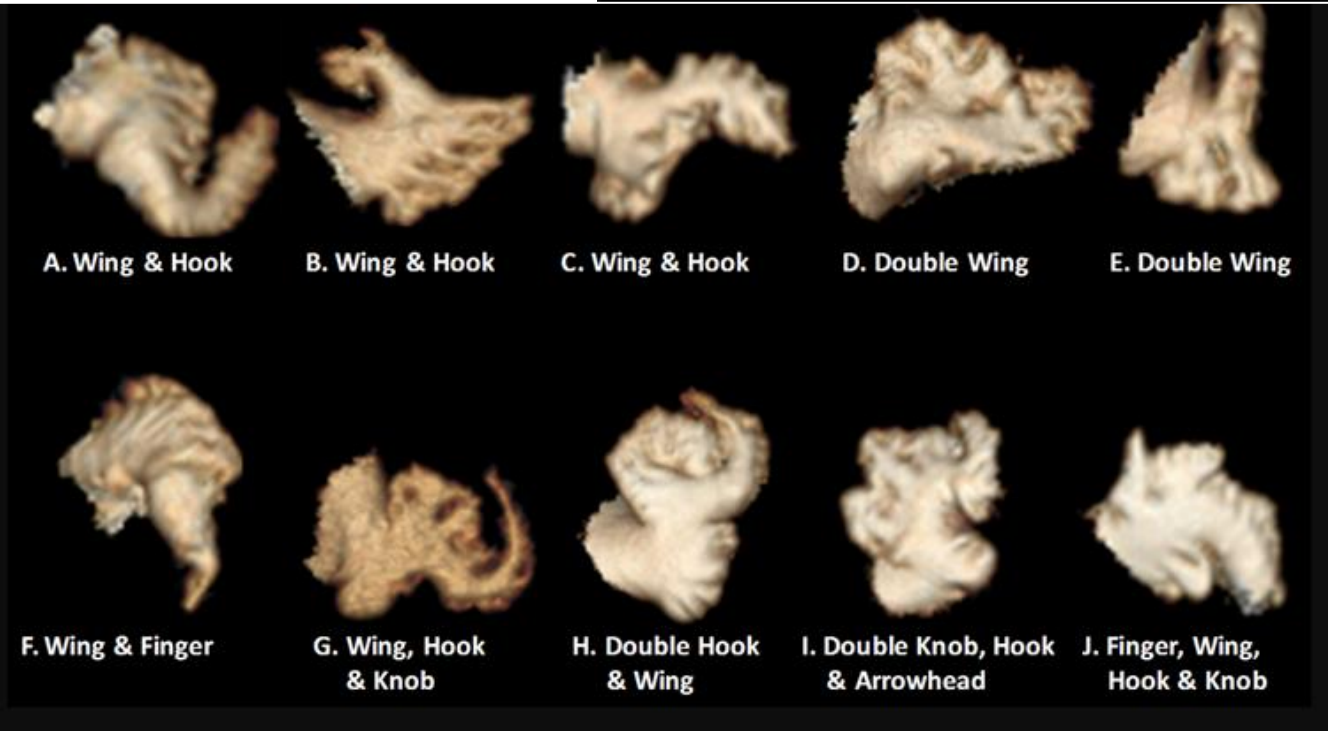
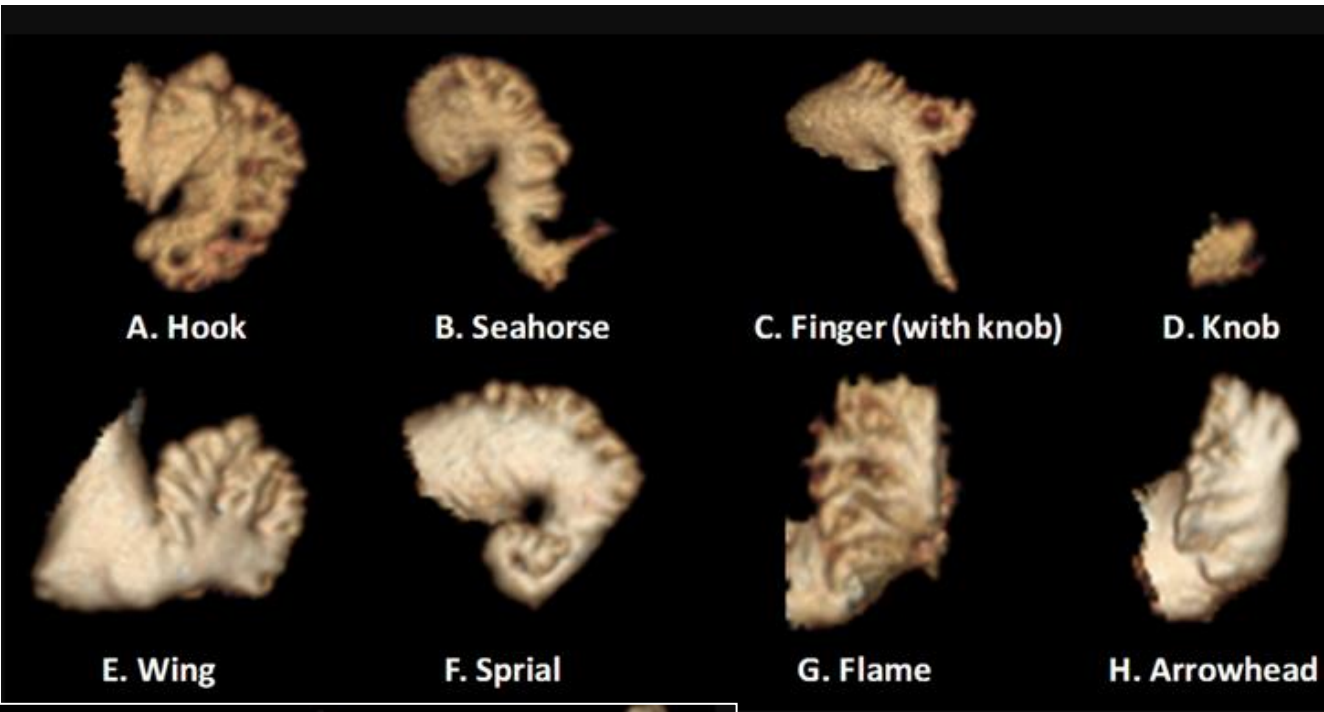
0 Recommendations

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LAA morphology differed significantly between stroke patients and controls, and single-lobed LAAs were overrepresented and LAA volume was larger in patients with acute ischemic stroke of cryptogenic or suspected cardiogenic etiology.

Korhonen M et al. Left Atrial Appendage Morphology in Patients with Suspected Cardiogenic Stroke without Known Atrial Fibrillation. PLoS ONE 10(3):e0118822.March 2015

**The Morphology of Left Atrial Appendage Lobes:
A Novel Characteristic
Naming Scheme Derived
through Three-
Dimensional Cardiac
Computed Tomography**



**Beutler DS.
World Journal of Cardiovascular
Surgery
Vol.4 No.3(2014)**

Success of Surgical Left Atrial Appendage Closure

Assessment by Transesophageal Echocardiography

Anne S. Kanderian, MD,* A. Marc Gillinov, MD,† Gosta B. Pettersson, MD, PhD,†
Eugene Blackstone, MD,† Allan L. Klein, MD, FACC*

Cleveland, Ohio

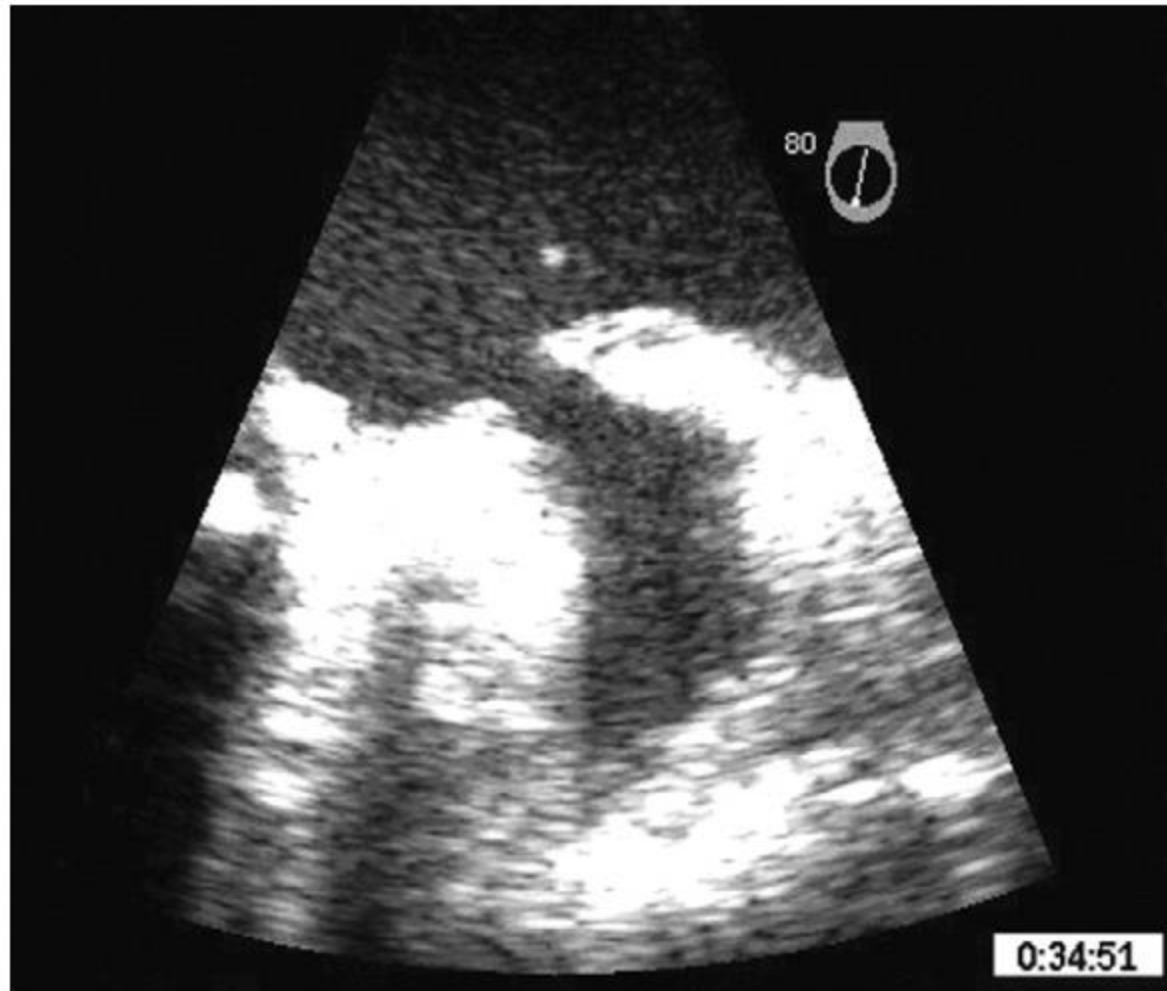
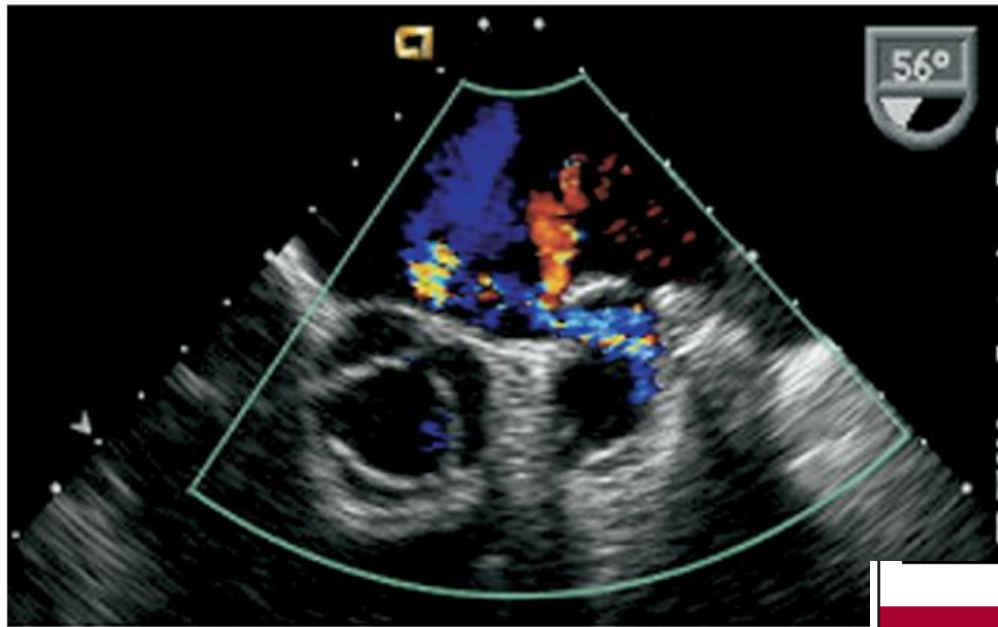
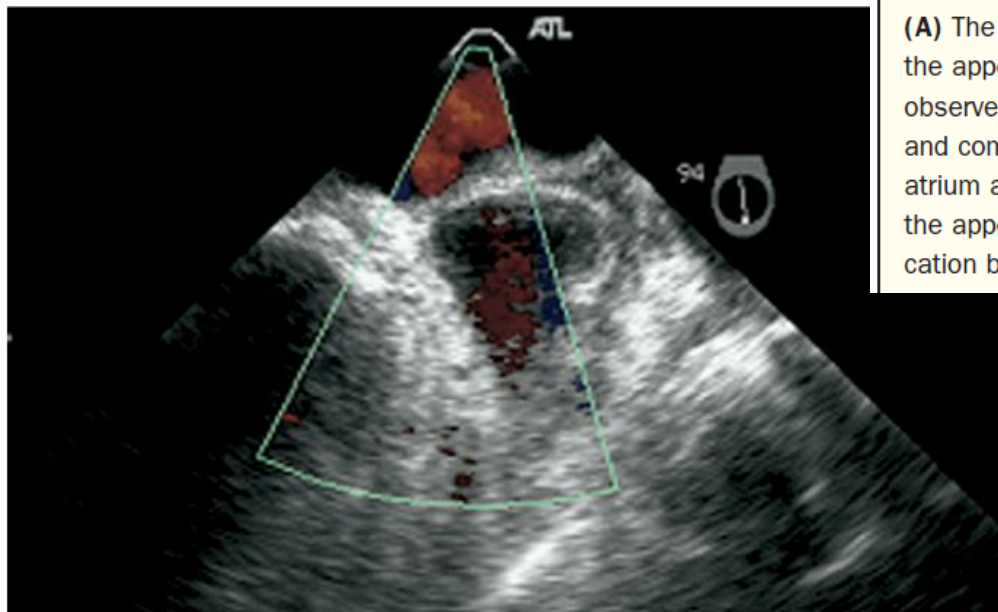


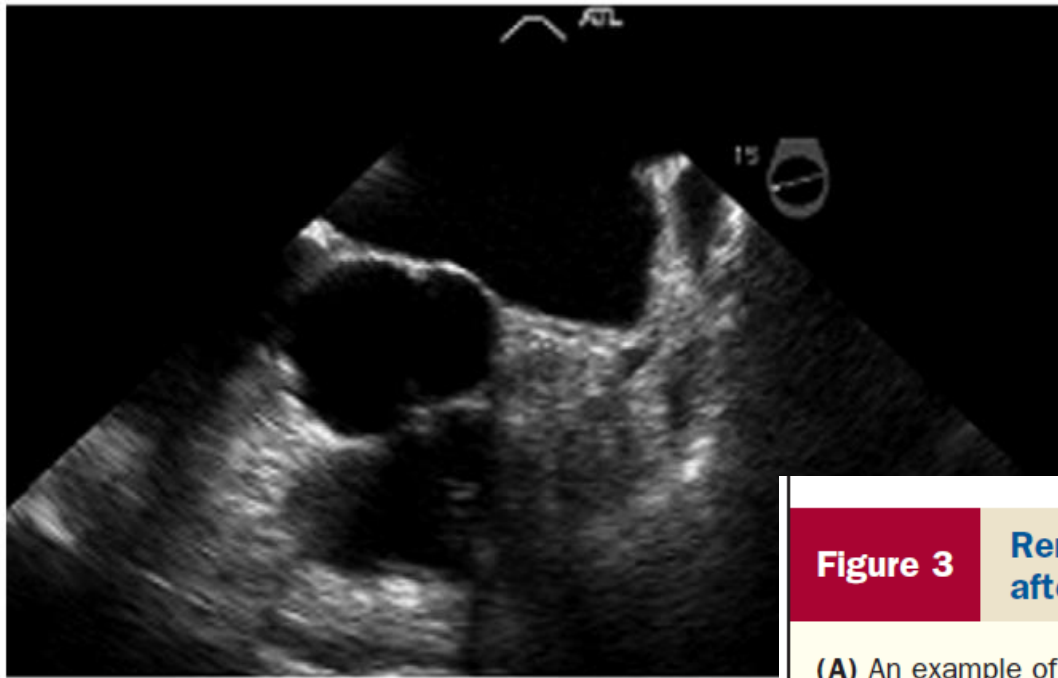
Figure 1 Patent Left Atrial Appendage After Suture Exclusion

This left atrial appendage is an example of a patent appendage that was previ-

A**B****Figure 2**

Persistent Flow Into the Left Atrial Appendage after Suture and Stapler Exclusion

(A) The left atrial appendage has been excluded by closing off the orifice of the appendage cavity from the atrium by sutures. There is a color flow jet observed between the atrium and the appendage suggesting persistent flow and communication. (B) The left atrial appendage remains attached to the atrium and has been excluded by stapling. However, there is persistent flow in the appendage demonstrated by color Doppler, suggesting persistent communication between the atrium and the appendage.

A**Figure 3****Remnant Left Atrial Appendage
after Excision and Suture Exclusion**

(A) An example of a left atrial appendage that has been excised is shown; however, a stump of the appendage (>1 cm) remains attached to the atrium and is referred to as remnant left atrial appendage. **(B)** The left atrial appendage has been excluded from the atrium by suturing. However, the position of the sutures leaves a remnant left atrial appendage (>1 cm), which remains in communication with the left atrium.

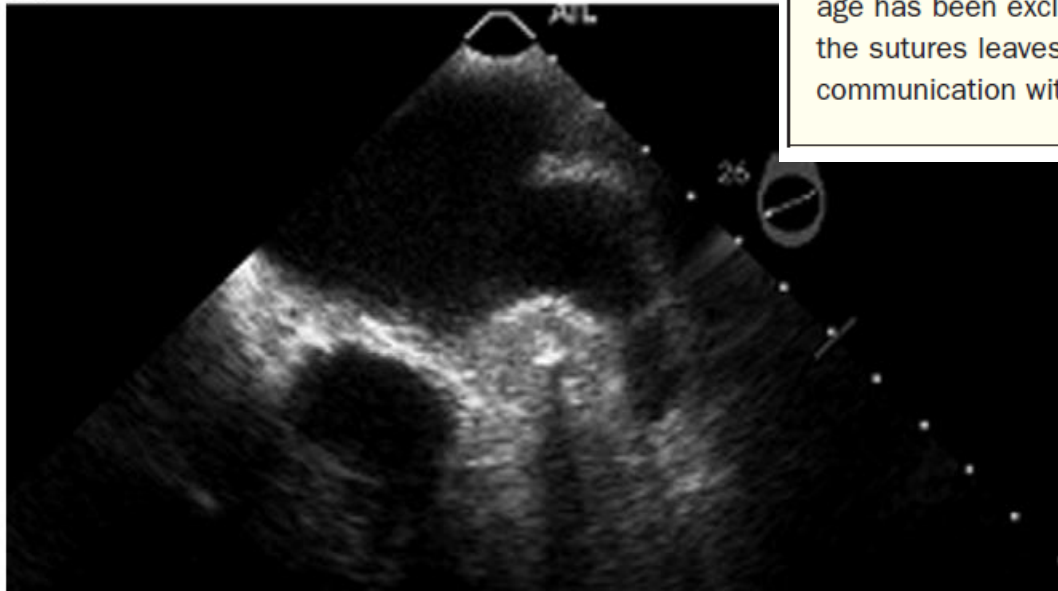
B

Table 2 Success of Different Techniques of LAA Closure

Type of Closure	n	Patent LAA	Remnant LAA	Excluded LAA With Persistent Flow	Successful LAA Closure
Excision	52	0	14 (27%)	0	38 (73%)*
Suture exclusion, n (%)	73	6 (8)	6 (8)	44 (61)	17 (23)*
Stapler exclusion, n (%)	12	2 (17)	7 (58)	3 (25)	0 (%)†
Total, n (%)	137	8 (6)	27 (20)	47 (34)	55 (40)

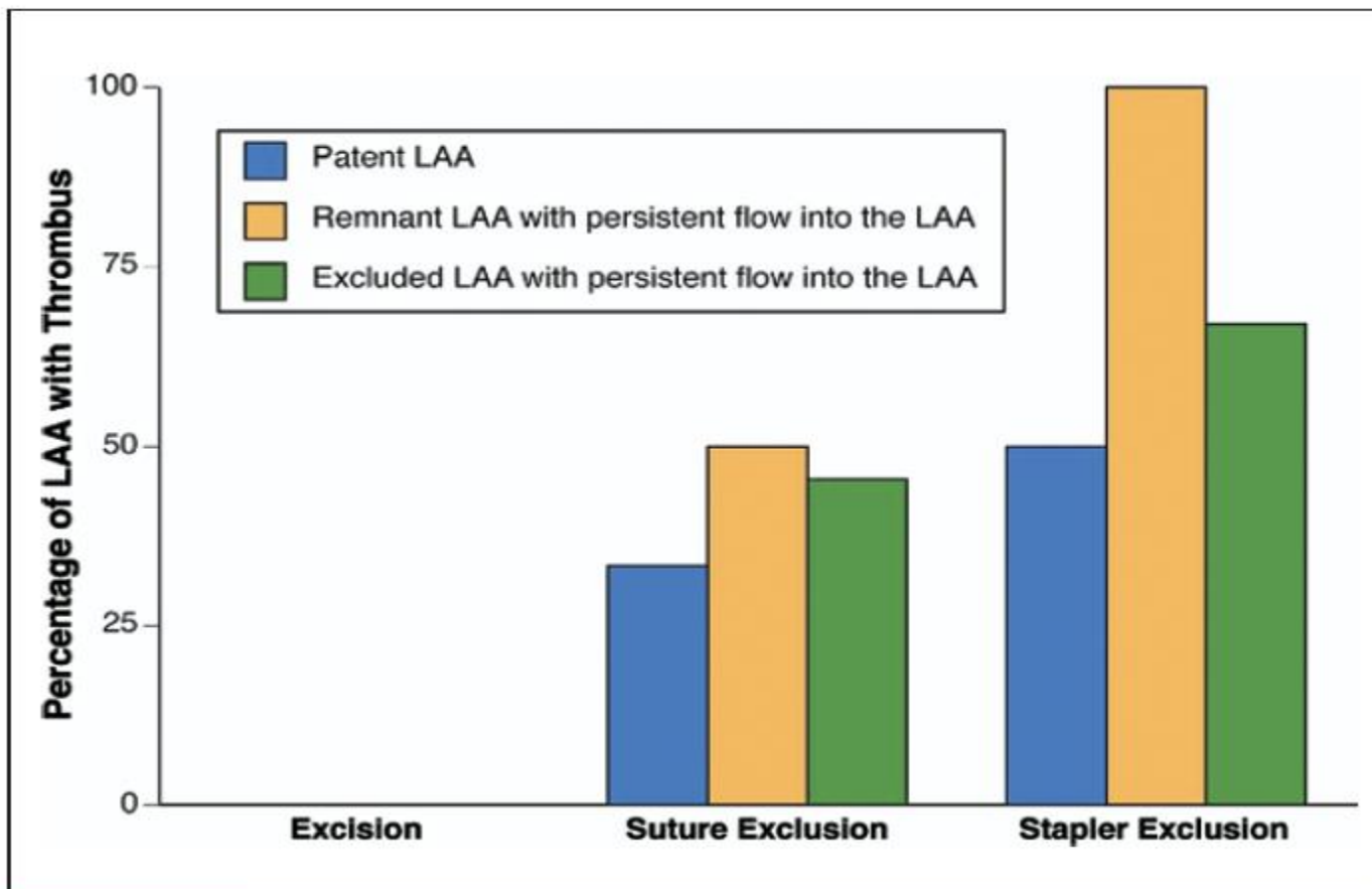


Figure 4

Occurrence of LAA Thrombus in Unsuccessful Surgical Closure

Shown is the presence of left atrial appendage thrombus with unsuccessful surgical left atrial appendage closure by the 3 techniques: excision, suture exclusion, and stapler exclusion. LAA = left atrial appendage.

Table 3**Variables That Are Related to Successful LAA Closure**

	Successful LAA Management	Unsuccessful LAA Management	p Value
Excision	38 (73)	14 (27)	<0.001
Suture exclusion, n (%)	17 (23)	56 (77)	<0.001
Stapler exclusion, n (%)	0 (0)	12 (100)	0.002
CABG, n (%)	1 (33)	2 (67)	1.00
Valve, n (%)	36 (42)	49 (58)	0.59
CABG + valve, n (%)	13 (30)	30 (70)	0.13
Other surgery, n (%)	5 (83)	1 (17)	0.04
Maze surgery, n (%)	28 (52)	26 (48)	0.03
Age, yrs	66 ± 11	65 ± 12	0.64
Male gender, n (%)	34 (43)	45 (57)	0.48
Hypertension, n (%)	35 (40)	52 (60)	1.00
Atrial fibrillation, (%)	23 (45)	28 (55)	0.37
Left atrial size, cm	4.9 ± 0.8	4.9 ± 0.9	0.72
Left atrial area, cm ²	27.1 ± 5.6	27.8 ± 8.3	0.69
Ejection fraction, %	45 ± 13	42 ± 16	0.33

Conclusions

From this study, we conclude that when surgical LAA closure is performed, excision of the appendage is the most reliable method. Our study raises the concern of discontinuing anticoagulation in patients with AF who have had surgical LAA closure due to the high rate of unsuccessful closure. If anticoagulation medication is to be discontinued, consideration should be given to performing a TEE to ensure successful LAA closure. Further studies are indicated to determine whether patients who undergo LAA closure demonstrate a reduction in thromboembolic events.

Adjusted stroke rate according to CHA₂DS₂-VASc score

CHA ₂ DS ₂ -VASc score	Patients (n = 7329)	Adjusted stroke rate (%/y)
0	1	0%
1	422	1.3%
2	1230	2.2%
3	1730	3.2%
4	1718	4.0%
5	1159	6.7%
6	679	9.8%
7	294	9.6%
8	82	6.7%
9	14	15.2%



Arrhythmias and Clinical EP

LEFT ATRIAL APPENDAGE CLOSURE DURING ROUTINE CARDIAC SURGERY INCREASES THE RISK OF POSTOPERATIVE ATRIAL FIBRILLATION AND DOES NOT REDUCE THE RISK OF STROKE: A PROPENSITY SCORE MATCHED ANALYSIS OF 9,833 PATIENTS

Oral Contributions

Room 1B

Sunday, March 15, 2015, 8:38 a.m.-8:49 a.m.

Session Title: Highlighted Original Research: Arrhythmias/Clinical EP and the Year In Review

Abstract Category: 4. Arrhythmias and Clinical EP: AF/SVT

Presentation Number: 900-08

Authors: *Bowlen Melduni, Eloka Ikebudu, Rakesh Suri, Hon-Chi Lee, Stephen Cha, Samuel Asirvatham, Hartzell Schaff, James Seward, Bernard Gersh, Mayo Clinic, Rochester, MN, USA*

Background: Prophylactic exclusion of the LAA is often performed during cardiac surgery to reduce the risk of stroke in patients with AF. However, the clinical impact and efficacy of LAA closure for stroke protection in humans remains inconclusive.

Methods: We conducted a retrospective study of 9,833 adults, mean age 65.5±14 years; 68.7% male) who underwent CABG and/or valve surgery between January 01, 2000 and December 31, 2005. Those undergoing or with prior history of maze and/or PVI, heart transplant, or congenital heart disease were excluded. We assessed the influence of LAA closure on the risk of postoperative AF (POAF) (≤30 days), stroke and long-term mortality (>30 days) by means of propensity score matching based on 26 preoperative covariates. A total of 443 matching pairs were derived.

Results: Of the 9,792 enrolled subjects analyzed, 3299 (33.7%) individuals developed POAF. Among the 469 (4.8%) patients who underwent LAA closure during CABG (5%) and valvular (95%) surgery, the incidence of POAF was 68.4% vs 31.9% for those who did not undergo LAA closure, $P<.001$. There was no difference in the incidence of postoperative surgical re-exploration for bleeding (4% vs 5%; $P=.72$) or hospital length of stay [median (IQR) 7 (5, 9) vs 6 (5, 9) days, $P=.11$] between the 2 groups. After a mean follow-up of 5.6±4.5 years, 1177 (12.1%) individuals developed stroke and 1115 (16.5%) patients died. The rates of stroke and mortality at 5 years among patients who underwent LAA closure vs those who did not undergo LAA closure were 4.3% vs 5.1%, $P=0.83$ and 25.7% vs 23.2%, $P=.05$, respectively. Stepwise multivariate regression analysis in the propensity score-matched cohort revealed that LAA closure was a strong independent predictor of POAF, OR (95% CI) = 2.83 (2.06-3.89), but did not significantly influence the risk of stroke, HR (95% CI) = 0.80 (0.53-1.22) or long-term mortality, HR (95% CI) = 0.99 (0.80-1.22).

Conclusion: LAA closure during routine cardiac surgery was independently associated with increased risk of POAF and does not significantly influence the risk of stroke or long-term mortality. It remains uncertain whether prophylactic LAA closure is warranted for stroke protection during non-AF related cardiac surgery.

Association of Surgical Left Atrial Appendage Occlusion With Subsequent Stroke and Mortality Among Patients Undergoing Cardiac Surgery.

Retrospective cohort January 1, 2009, and March 30, 2017,

One-to-one propensity score matching to compare those with vs without LAAO

RESULTS: N=75 782, 22091 [29.2%] women, 25 721 [33.9%] with preexisting AF), 4374 (5.8%) underwent concurrent LAAO, and mean follow-up was 2.1 (SD, 1.9) years.

8590 propensity score-matched patients

In patients **with prior AF** (6438/8590 [74.9%])

with vs without LAAO, risk **stroke = 1.11 vs 1.71 events / 100 person-years** (HR, 0.68) P = .01)

risk of mortality = 3.22 vs 4.93 events / 100 person-years (HR, 0.67 ; P < .001)

In patients **without prior AF** (2152/8590 [25.1%])

with vs without LAAO, risk **stroke = 1.23 vs 1.26 events / 100 person-years** (HR, 0.95)NS

risk of mortality = 2.30 vs 2.49 events / 100 person-years (HR, 0.92)NS

risk of postoperative AF was 27.7% vs 20.2% events per 100 person-years (HR, 1.46); P < .001).

CONCLUSIONS AND RELEVANCE:

Among patients undergoing cardiac surgery, concurrent surgical LAAO, compared with no surgical LAAO, was associated with reduced risk of subsequent stroke and all-cause mortality.

Background and Rationale (1)

- AF is an important cause of stroke
- Most strokes (70%) in AF patients are cardio-embolic originating from the LAA
- 3 main approaches to stroke prevention in AF patients:
 - 1) Elimination of AF itself
 - No AF therapy to date has been able to suppress all AF episodes
 - 2) Prevention of clot formation by medical therapy (either antiplatelet or anticoagulant)
 - Very effective but is limited by potential for serious bleeding and by the general problem of continuity of treatment (under-prescription, non-compliance, sub-optimal anticoagulation control, treatment withdrawal)
 - 3) Physical elimination of the LAA
 - Results from smaller trials are encouraging , but not definitive

LAAOS III Study Design

- ⦿ A multicentre, international, randomized trial of left atrial appendage occlusion or no occlusion in adult atrial fibrillation patients undergoing cardiac surgery with the use of CPB
- ⦿ Patients will be randomly allocated to occlusion of the LAA or no LAA occlusion
- ⦿ Follows the intention-to-treat principle
- ⦿ 4,700 patients in approximately 80-100 centres

Study Objectives

Primary Objective

- Incidence of stroke or systemic arterial embolism over duration of follow-up

Secondary Objectives

- Total mortality
- Operative safety outcomes (chest tube output in first 24 hours, post-op re-exploration for bleeding in first 48 hours, and 30-day mortality)
- Incidence of re-hospitalization for heart failure
- Incidence of major bleeding
- Incidence of myocardial infarction

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31 Studies found for: **Completed, Terminated Studies | left atrial appendage**

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Status

Recruitment ⓘ

- Not yet recruiting
- Recruiting

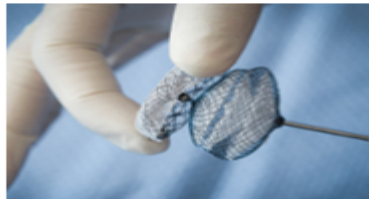
Showing: 1-10 of 31 studies studies per page [Show/Hide Columns](#)

Row	Saved	Status	Study Title	Conditions	Interventions	Locations
1	<input type="checkbox"/>	Terminated	Evaluation of the Cardioblade Closure Device in Facilitating Occlusion of the Left Atrial Appendage	• Left Atrial Appendage Occlusion	• Device: Medtronic LAA Occlusion Device	• Eisenhower Medical Center Rancho Mirage, California, United States • Yale University

CSI FOCUS LAA 2018

How to close the left atrial appendage workshop

NOVEMBER 16 - 17, 2018
FRANKFURT, GERMANY



ONLY 7 WEEKS TO GO UNTIL CSI FOCUS LAA 2018

Left atrial appendage (LAA) closure is increasingly performed in patients with atrial fibrillation (AF) who cannot take oral anticoagulation due to contraindications, intolerance, high bleeding risk, or patient refusal.

Join us in Frankfurt, November 16-17 at CSI Focus LAA - the largest LAA closure congress, drawing attendees from all over the world. Our faculty of distinguished experts will guide you through this treatment modality focusing on the following topics:

- Imaging the LAA
- How to get access to the LAA
- Devices and techniques: established, recently approved and still in the pipeline
- New indications and strategies to explore
- How to find appropriate patients
- Complications of LAA closure
- Postprocedural follow up after LAA closure
- Challenging cases - advanced tips and tricks

LIVE TRANSMISSIONS FROM CVC FRANKFURT

The first minimally invasive LAA closure was performed by Horst Sievert in 2001. In the record of performing LAA closures, the team from the CardioVascular Center Frankfurt transmit live cases throughout the two day program of the congress. For a sample [watch a live case from CSI Frankfurt here >>](#)

GAIN VALUABLE EXPERIENCE IN HANDS-ON WORKSHOPS

Stay tuned for news about opportunities to participate in practical workshops at CSI Focus LAA 2018. We will be providing imaging techniques for everyday clinical practice with case assessment by participants and real-time corrections and guidance, as well as device based workshops to introduce you to new devices, techniques and to improve your procedural efficiency. Details will be announced shortly. **Secure your space and register for the congress >>**

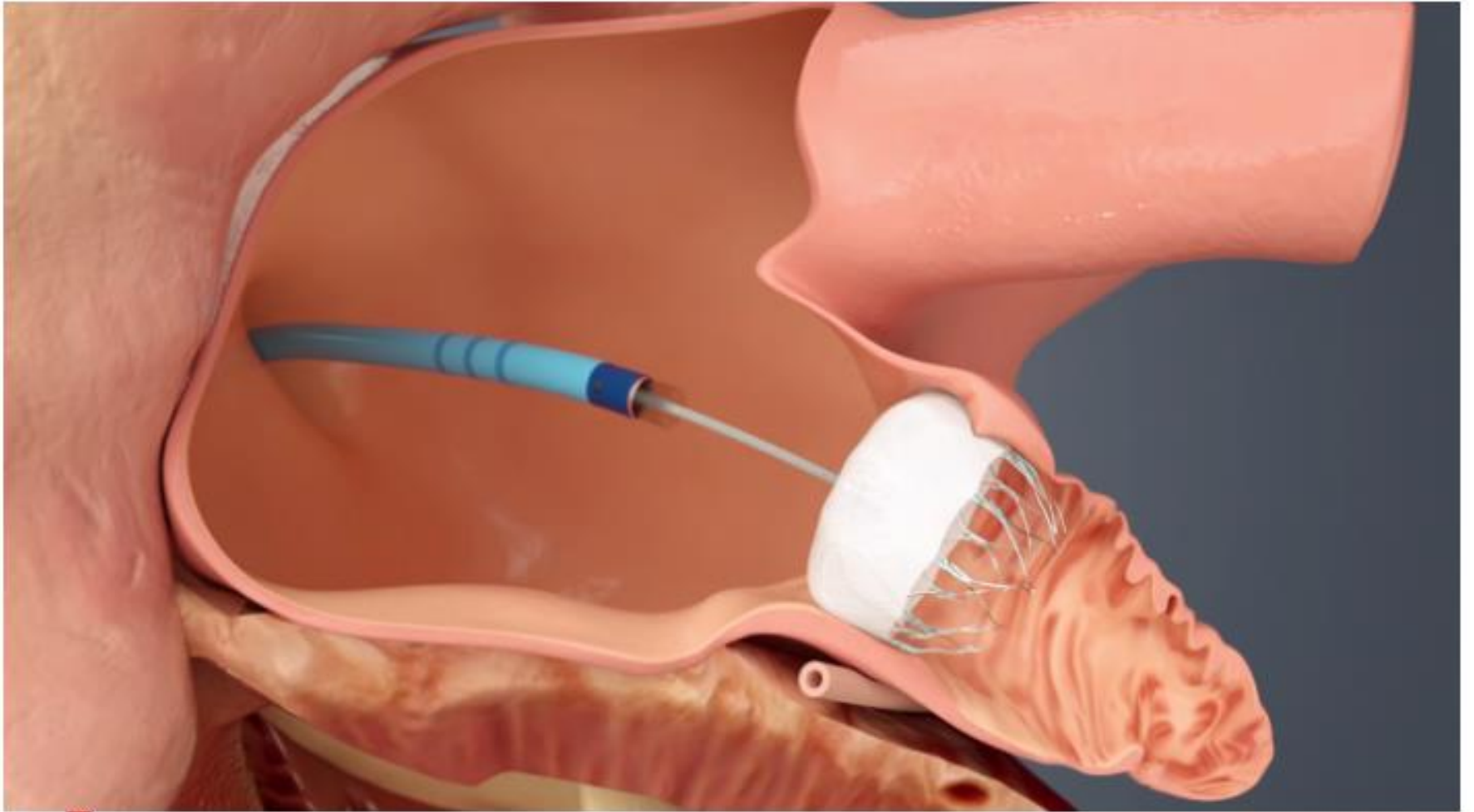
ATTENDEE SUPPORT FOR EUROPEAN PHYSICIANS

In line with the new MedTech regulations, together with Boston Scientific we are able to offer indirect educational support in the form of educational allowances towards your participation at CSI Focus LAA 2018.

For more details of the process refer to our [general conditions](#).

Deadline for educational allowance applications: October 1, 2018

[Apply now by filling out our educational allowance application here >>](#)

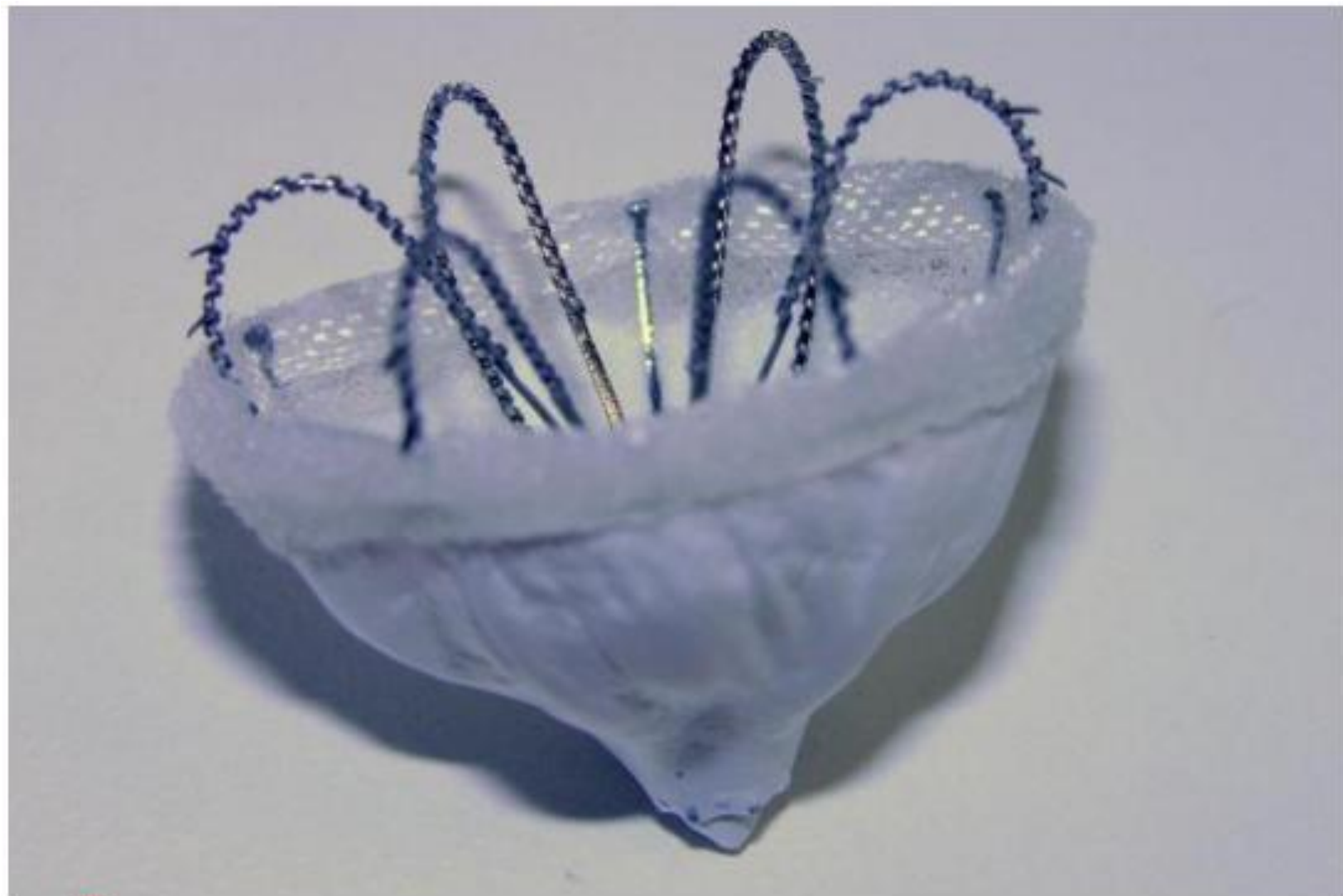


An illustration of a Watchman transcatheter LAA occluder being implanted.

St. Jude Medical Launches Amplatzer Amulet LAA Occluder Trial

IDE trial will expand access to the left atrial appendage occluder device to patients in the United States who are in need of LAA closure to reduce their risk of stroke





Coherex WaveCrest Left Atrial Appendage (LAA) Occlusion System.



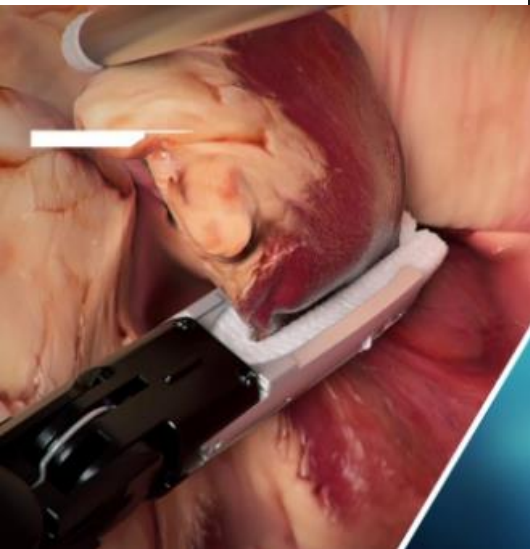
NEWS | STRUCTURAL HEART | FEBRUARY 18, 2016

AtriCure Enrolls First Patient in ATLAS Study

Randomized multi-center trial will evaluate the effects of excluding the left atrial appendage in cardiac surgery patients at high risk of developing post-operative atrial fibrillation



February 18, 2016 — AtriCure Inc. announced that the first patient was enrolled and treated at PinnacleHealth Hospitals in Harrisburg, Pa., in the ATLAS clinical study. This observational study



FDA Announces Safety Issues With Lariat Left Atrial Appendage (LAA) Closure Device

FDA reports of patient deaths and other serious adverse events



SentreHeart Receives CE Mark for Lariat Suture Delivery Device

Device gives European surgeons a new option for soft tissue closure, including the left atrial appendage



NEWS | [LEFT ATRIAL APPENDAGE \(LAA\) OCCLUDERS](#) | JULY 01, 2015
SentreHEART Receives FDA Approval for AMAZE Trial of Lariat Suture Delivery Device

October 28, 2015 — SentreHeart Inc. announced that it has received CE Mark approval for the Lariat Surgical Left Atrial Appendage (LAA) Suture Delivery Device. The Lariat Surgical LAA device is a

July 13, 2015 - The U.S. Food and Drug Administration (FDA) is alerting healthcare providers and patients about reports of patient deaths and other serious adverse events associated with the use of the SentreHEART Lariat Suture Delivery Device used for minimally invasive surgical closure of the left atrial appendage (LAA). The LAA is a pouch-like region of the left atrium that is implicated as the source of stroke causing clots in patients with atrial fibrillation.

vai-ΔKΔOisu3In77eWmniulrReOm71oydzvbnΔP-hHhO7hDΔtatolQiuWf3Nmul_oeV_lmuV7-qWv71lQki3n1RtF



Video 1. Endocardial LAA suture. During a minimally-invasive mitral valve repair procedure, once on cardiopulmonary bypass, after valve repair and once the left atrial ablation is done, the LAA is sutured directly. For this a 4/0 running suture in two layers can be performed. It is crucial to make deep bites to ensure tight tissue approximation which will offer durable occlusion. Transesophageal echocardiography (TEE) to document LAA closure is mandatory. If the LAA remains perfused, even in a slight form, this should be addressed immediately as this poses a lethal problem [8].



Video 2. LAA stapler occlusion. During open heart surgery abdominal staplers can be used to staple the LAA. In the totally thoracoscopic setting of ablation for AF, LAA occlusion is performed by stapler excision. Using minimal, gentle manipulation, the left atrial appendage is grasped at its base with an articulated endo-stapler with green roticulator load (AutoSuture). The stapler should be closed into position only once and fired without any twisting or pulling of the stapler.

Totally Thorascopic Closure of the Left Atrial Appendage



Figure 1. Prior to discharge on postoperative day 1 after TT LAA AtriClip application.

Figure 2. Computed Tomography Angiogram at one year confirming total flush LAA occlusion

Ramlawi B, Bedeir K, Edgerton JR,
Totally Thorascopic Closure of the Left Atrial
Appendage,
The Annals of Thoracic Surgery (2018),
doi: <https://doi.org/10.1016/j.athoracsur.2018.07.046>.

1Heart & Vascular Center, Valley
Health System, Winchester, VA
2Brigham and Women's Hospital,
Boston, MA
3The Heart Hospital, Baylor, Plano, TX

CLINICAL PRACTICE GUIDELINE: FULL TEXT

2014 AHA/ACC/HRS Guideline for the Management of Patients With Atrial Fibrillation



A Report of the American College of Cardiology/American Heart Association
Task Force on Practice Guidelines and the Heart Rhythm Society

Developed in Collaboration With the Society of Thoracic Surgeons

4.4. Nonpharmacological Stroke Prevention

4.4.1. Percutaneous Approaches to Occlude the LAA

WATCHMAN, AMPLATZER, LARIAT **Sem recomendação**

4.4.2. Cardiac Surgery—LAA Occlusion/Excision:

Recommendation CLASS IIb

1. Surgical excision of the LAA may be considered in patients undergoing cardiac surgery. (Level of Evidence: C)

STS Guidelines 2017

- At the time of concomitant cardiac operations in patients with atrial fibrillation, it is reasonable to surgically manage the LAA for longitudinal thromboembolic morbidity prevention.*

Class IIA, Level C, expert opinion



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DATA: 25 e 26 de outubro de 2018

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Módulo: Fibrilação Atrial

O Que Fazer com o Apêndice Atrial Esquerdo

CONCLUSÕES

AAE é estrutura complexa

Ressecção é eficaz. Exclusão menos eficaz

Necessária comprovação por Eco TE trans-op:

ausência de fluxo e coto < 1cm

Suspensão de anticoagulação??

Considerar escores de risco trombo X sangramento

Ensaio clínico em andamento poderão contribuir

No momento atual, recomendação IIA ou IIB

Exclusão por toracoscopia é eficaz e mais econômica