

Indirect and Direct Evidence for 3-D Activation During Left Atrial Flutter: Anatomy of Epicardial Bridging

Objective

Describe arrhythmia characteristics using ultra-high density (UHD) mapping of macro-re-entrant left atrial flutter (LAFL) which propagate via (epicardial bridging) EB, and highlight regional anatomy that poses challenges to ablate.

1. Describe arrhythmia characteristics of LAFL's that use EB with emphasis on anatomical correlation
2. Provide indirect/direct evidence for EB via epicardial access in selected pt's with LAFL using UHD

Prospective ablation registry from June 2015-March 2020

159 patients total

116 PVI alone

43 patients (47 LAFL's) underwent UHD mapping and ablation for LAFL

27% with previous cardiac surgery

60% prior LA catheter ablation

Of 43 patients, evidence of EB was observed in 17 patients (18 LAFL) (38%)

6 Biatrial-----BR+CS

2 Roof-----SPB

2 PW-----SPB

8 MAF-----5 VoM, 3 CS

9 patients (41%) yielded Direct evidence of EB

4 Anatomic Epicardial Bridge Areas

1. Bachmann's Region—33%
2. Coronary Sinus--17%
3. Vein of Marshall--28%
4. Septopulmonary Bundles—22%

Although ablation gaps may occur in 2-D, the presence of nontransmural fibrosis or ablation lesions without complete penetration across the atrial wall creates 3-D gaps in activation that may be critical for re-entry. As no patients were observed to have de novo EB, it is most likely that the phenomenon of EB is iatrogenic, as conduction through normal tissue is transmurally uniform and nontransmural ablation creates activation restricted to the epicardial layer. Epicardial connections with complex myofiber architecture serve as activation bridges during discontinuous endocardial activation and remain intact with inadequate lesion depth.

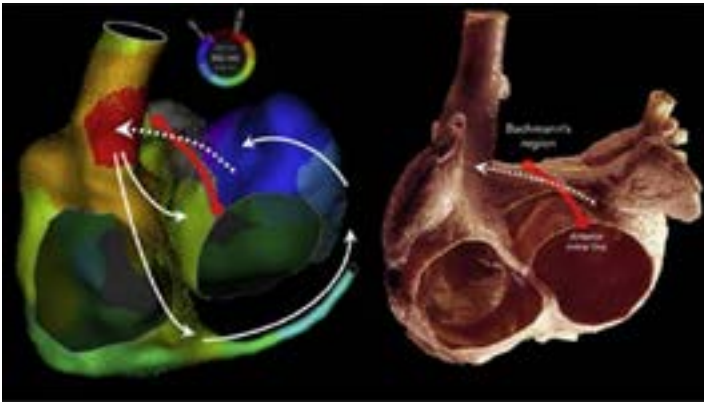
Indirect and Direct Evidence for 3-D Activation During Left Atrial Flutter: Anatomy of Epicardial Bridging (continued)

The Hybrid AF Convergent Procedure address Epicardial Bridges

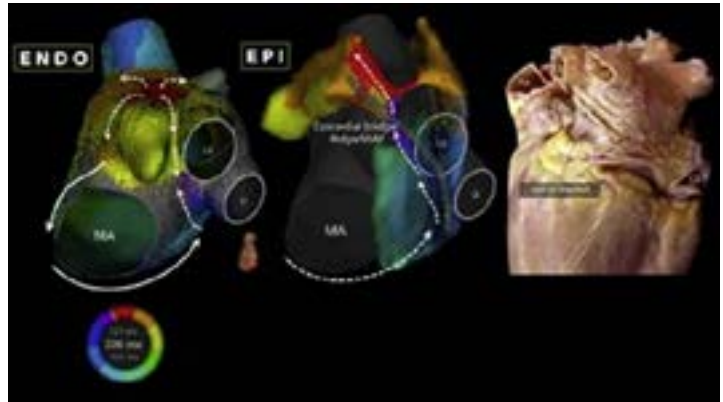
The 4 Anatomic Epicardial Bridge Areas

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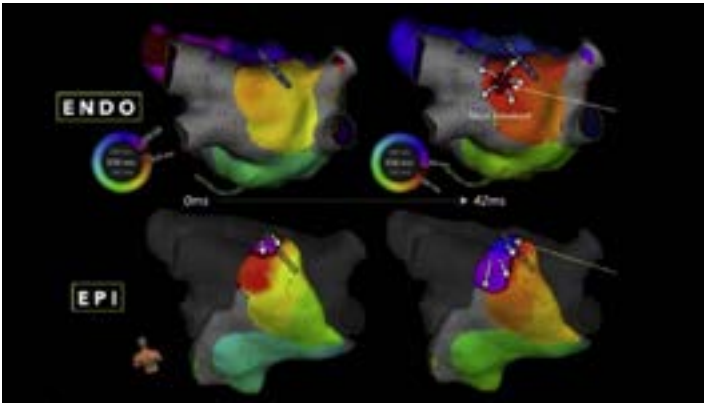
Bachmann's Region



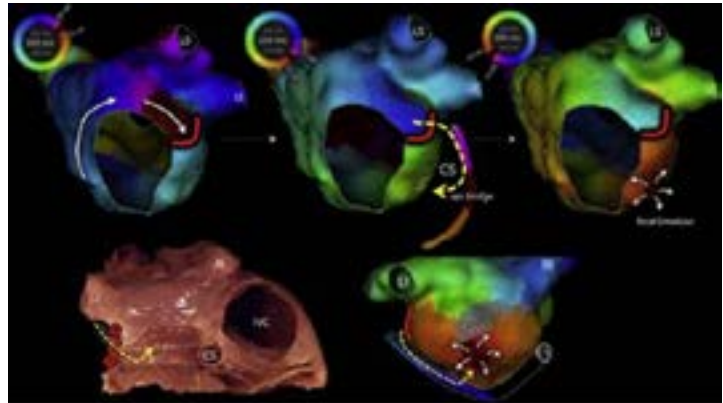
Vein of Marshall



Septopulmonary Bundles



Coronary Sinus



Reference: Nayak, H.M. et al. (2020). Indirect and Direct Evidence for 3-D Activation During Left Atrial Flutter: Anatomy of Epicardial Bridging. J Am Coll Cardiol EP, 6(14):1812-23.

Epi-Sense® System Instructions For Use: PMA# P200002

Epi-Sense® Guided Coagulation System

U.S. Indications: The Epi-Sense Guided Coagulation System is intended for the treatment of symptomatic long-standing persistent atrial fibrillation (continuous atrial fibrillation greater than 12 months duration) when augmented in a hybrid procedure with an endocardial catheter listed in the instructions for use, in patients (1) who are refractory or intolerant to at least one Class I and/or III antiarrhythmic drug (AAD); and (2) in whom the expected benefit from rhythm control outweighs the potential known risks associated with a hybrid procedure such as delayed post-procedure inflammatory pericardial effusions. **Contraindications** include patients with Barrett's Esophagitis, left atrial thrombus, a systemic infection, active endocarditis, or a localized infection at the surgical site at the time of surgery. **Adverse Events:** Reported adverse events associated with epicardial ablation procedure may include, but are not limited to, the following: pericardial effusion/cardiac tamponade, pericarditis, excessive bleeding, phrenic nerve injury, stroke/TIA/neurologic complication. Please review the Instructions for Use for a complete listing of contraindications, warnings, precautions and potential adverse events located at the following AtriCure web address: <https://www.AtriCure.com/Epi-Sense-Coagulation-Device>. **Warnings:** Physicians should consider post-operative anti-inflammatory medication to decrease the potential for post-operative pericarditis, and/or delayed post-procedure inflammatory pericardial effusions. Physicians should consider post-procedural imaging (i.e. 1-3 weeks post-procedure) for detection of post-procedure inflammatory pericardial effusions. **Precautions:** Precautionary measures should be taken prior to considering treatment of patients: (1) Deemed to be high risk and who may not tolerate a potential delayed post-procedure inflammatory pericardial effusion. (2) Who may not be compliant with needed follow-ups to identify potential safety risks. To ensure patients undergoing treatment with the Epi-Sense device are well informed, the benefits, potential risks and procedural outcomes associated with the Epi-Sense Hybrid Convergent procedure should be discussed with the patient. Physicians should document accordingly in the medical record. Qualified operators are physicians authorized by their institution to perform surgical sub-xyphoid pericardial access. The coagulation devices should be used by physicians trained in the techniques of minimally invasive endoscopic surgical procedures and in the specific approach to be used. Operators should undergo training on the use of Epi-Sense device before performing the procedure. Safety and effectiveness of concomitant left atrial appendage closure was not evaluated in the CONVERGE study. Follow-up should be conducted at approximately 30 days post-procedure to monitor for signs of delayed onset pericarditis or pericardial effusion. **Rx Only.**