Non-pulmonary vein triggers and associated pathological substrate: Inroads into the less understood science of non-paroxysmal atrial fibrillation therapeutic targets with a novel non-contact mapping system

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Objective:
The treatment of triggers has been shown to improve freedom from arrhythmias. Current, AF ablation success rates remain suboptimal. The mechanisms behind AF arrhythmogenesis are theorized to involve an interplay between AF triggers and abnormal substrate.

Methods:
- Prospective multicenter study of 54 patients
- Triggers were identified in 48 patients and ablated in 45 patients
- After Pulmonary Vein Isolation (PVI), an inotropic infusion was initiated (for 10 minutes at 20μg/ml), and Premature Atrial Contractions (PACs) occurring at a rate of ≥ 5 per minute were targeted for ablation

Key Findings:
- Triggers are distributed throughout both atrium
  - Only <1% had the highest density (>10 Tr./cm)
  - Median density was 1 Tr./cm
  - Only 37% had no triggers
- Trigger sites were found to be significantly slower (26%) than the rest of the atrial tissue

“Patient-specific ablation for non-PV triggers is crucial due to the strong physiological coupling and diverse localization of trigger-substrate events.”

- DJ Lakkireddy, MD

Conduction Velocity at the Trigger Site (within 1 cm) compared to the rest of the atrial body.

Median speed outside of trigger (blue) = 0.66 m/s.
Median speed inside of trigger (magenta) = 0.49 m/s.

Trigger Density Across the Atrium