

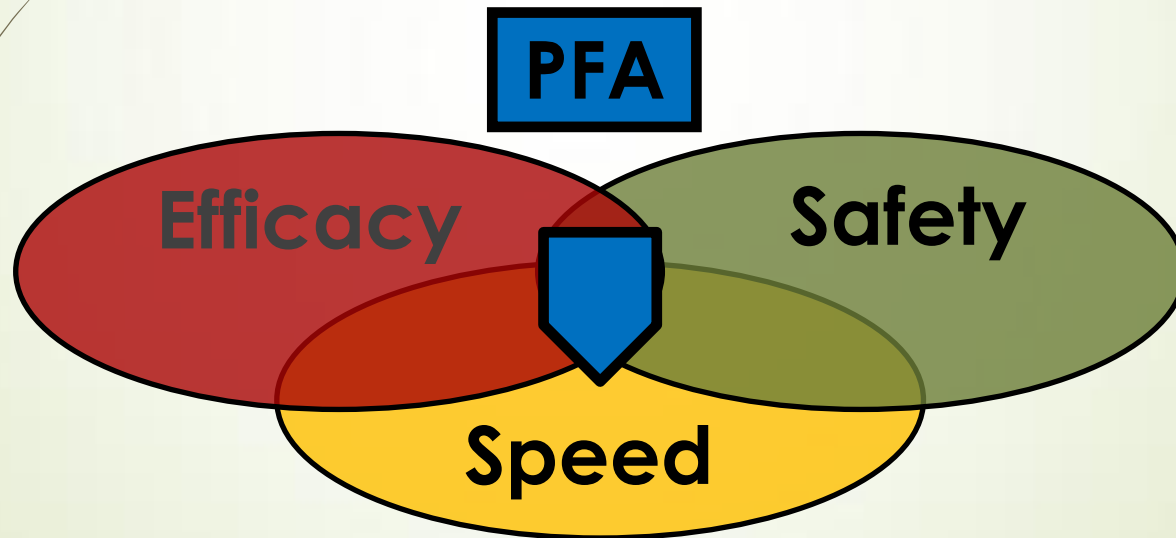
# Ablace kavotrikuspidálního isthmu pomocí fokální PFA; zkušenosti jednoho centra

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## CTI PFA using Centauri PEF system

**Irreversible electroporation (pulsed field ablation, PFA) is a highly effective and safe method for ablation of cardiac arrhythmias**



## Introduction

- **Catheter ablation of the cavotricuspid isthmus (CTI) remains the gold standard for treating typical atrial flutter**
- **Pulsed field ablation (PFA) has emerged as a promising alternative to radiofrequency (RF) energy for atrial fibrillation (AF) ablation characterized by a favorable safety profile and high clinical efficacy**
- **PFA of the CTI is characterized by some specific complications**
  - **1. Coronary vasoconstriction, coronary spasm (CS) during ablation close to the coronary artery**
  - **2. Atrioventricular (AV) conduction disturbances during ablation of the CTI**

## Introduction

- **Several methods used for ablation of the afib are also used for CTI ablation**
  - **1. Bipolar PFA using pentaspline catheter Farapulse (Boston Scientific, Marlborough, MA, USA)**
  - **2. Focal monopolar PFA system (FPFA) - standard irrigated contact force-sensing catheter paired with the Centauri PFA System generator (CardioFocus, Marlborough, MA, USA)**
  - **3. Large footprint ablation system Affera (Medtronic, Minneapolis, MN, USA)**

- According to a recent review, the overall risk of CS across all PFA systems is remarkably low at 0.04% and AV conduction disturbances are extremely rare <sup>1</sup>
- There is a lack of sufficient data specifically for the Centauri PEF system
- Randomized trial comparing RFA and PFA using Centauri system for CTI ablation demonstrated a relatively high incidence of CS (5%) and AV conduction disturbances (2%)<sup>2</sup>
- The role of PFA as a standard tool for CTI ablation is uncertain and more data are needed
- The aim of our study is to present the acute safety and efficacy outcomes of focal pulsed field ablation (FPFA) for CTI in a large, consecutive patient cohort within a standard clinical setting

<sup>1</sup> Rodriguez-Soto et al. Safety and Efficacy of Pulsed Field Ablation for Cavotricuspid Isthmus-Dependent Flutter: A Systematic Literature Review. J Cardiovasc Electrophysiol. 2025;36(8):2013-2024

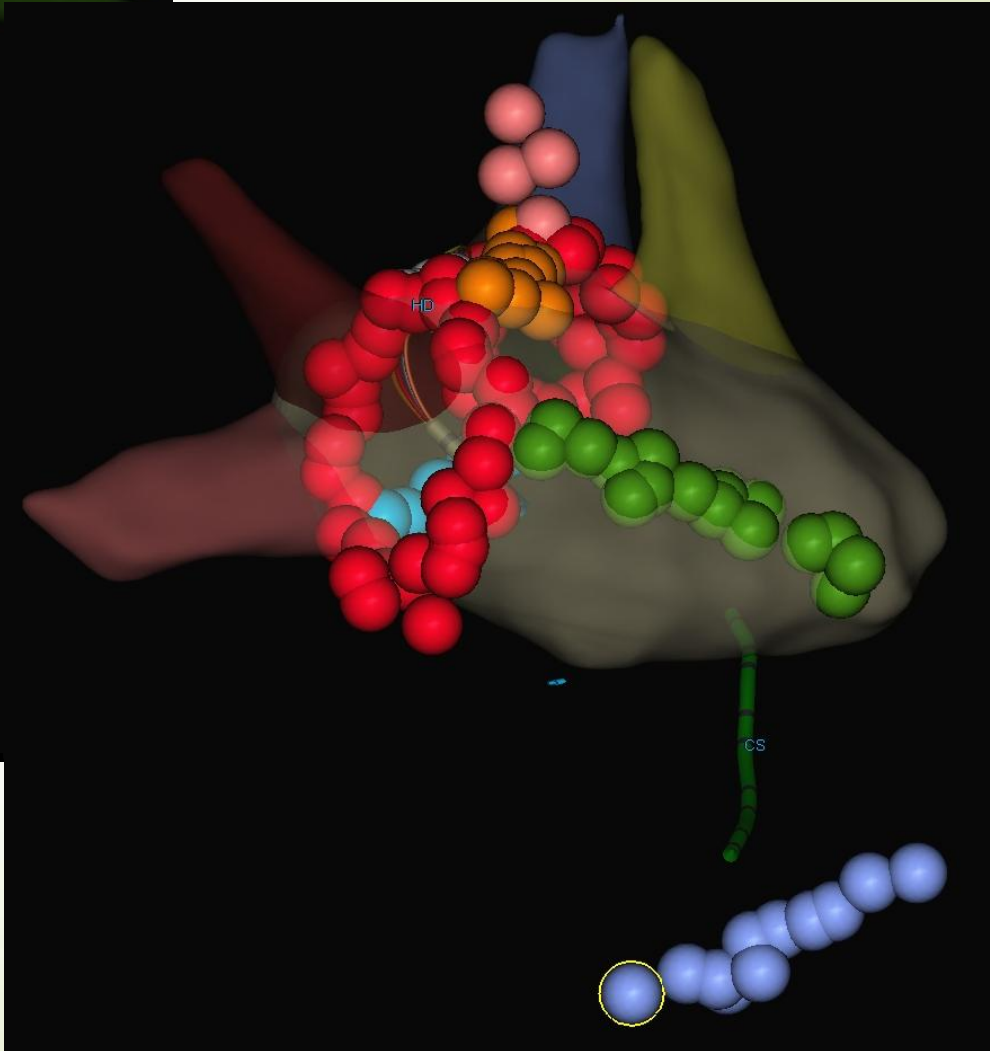
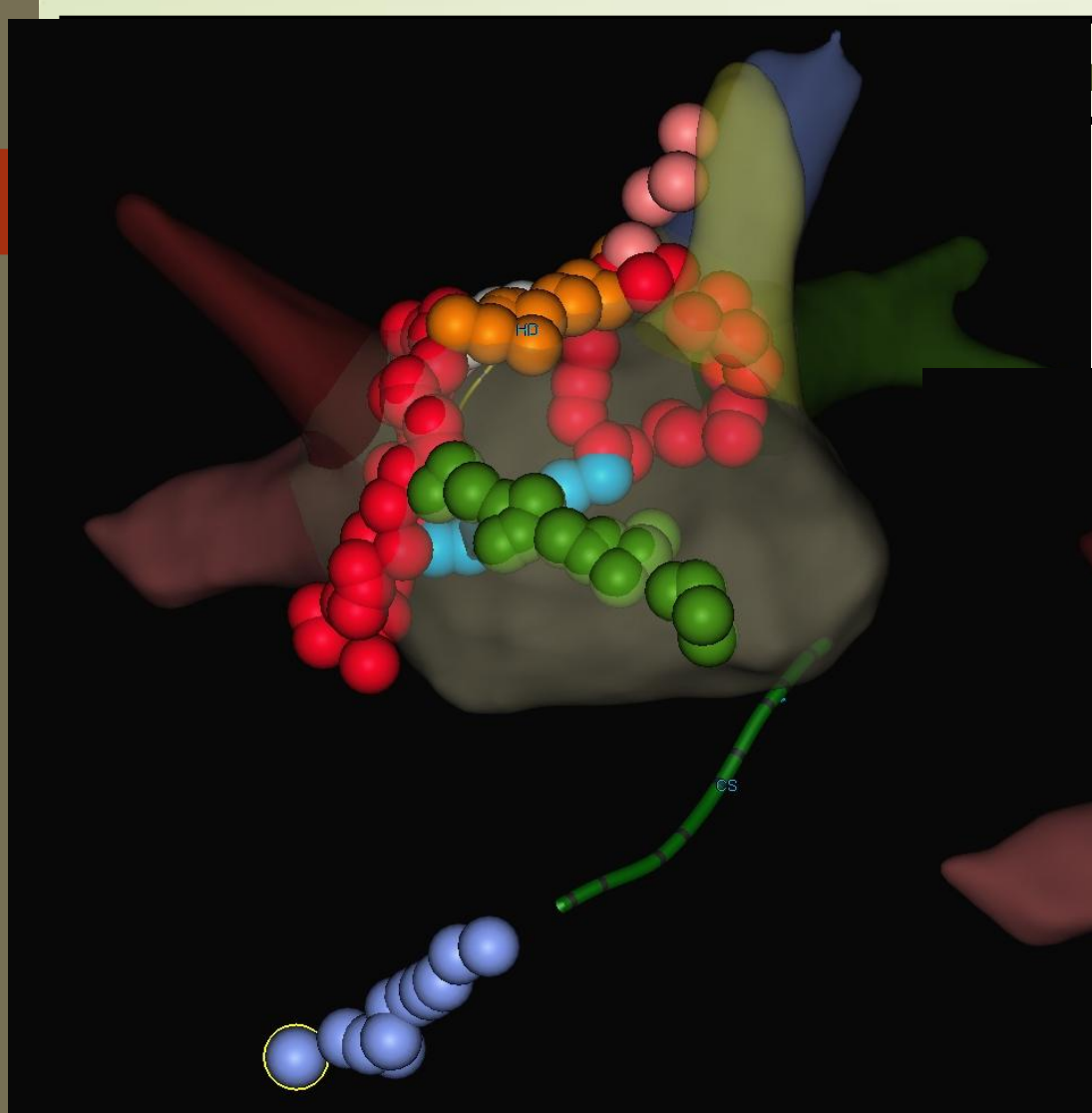
<sup>2</sup> Farnir FIP et al, Ablation of cavotricuspid isthmus-dependent atrial flutter using a focal monopolar pulsed-field ablation catheter: Feasibility, periprocedural coronary spasms and conduction disorders. Heart Rhythm. 2026 Jan;23(1):105-113.

# CTI PFA using Centauri PEF system

## Methods

- **Study design**
  - **single-center, retrospective analysis evaluating the acute safety and efficacy of CTI ablation using the Centauri PEF System (CardioFocus, Marlborough, MA)**
  - **Consecutive cohort of patients undergoing CTI ablation as part of:**
    - **I Primary ablation for typical atrial flutter**
    - **II Primary ablation for atrial fibrillation**
    - **III Primary ablation for atypical atrial flutter**
    - **IV Redo procedures for recurrent atrial fibrillation**
  - **Efficacy and safety data were recorded and statistically analyzed**

# Methods



- Duration of CTI ablation (min)
- Length of the CTI line
- Number of ablation points
- First pass block
- Number of reconductions



## Methods

### ➤ Procedure details - safety

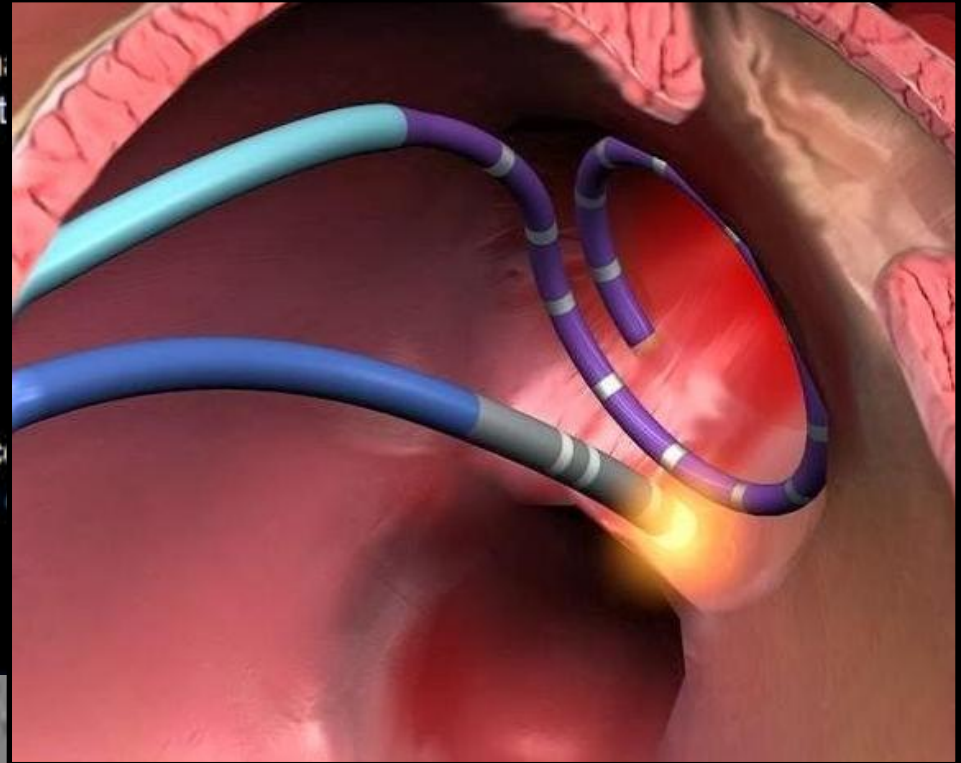
#### ➤ Coronary spasm

- To monitor for CS, a 12-lead ECG was continuously recorded in all patients
- In case of any repolarization abnormalities (ST-segment elevation or depression or T-wave inversion) intravenous boluses of nitroglycerin were administered

#### ➤ Conduction disturbance was defined as

- PR interval prolongation of  $> 20$  ms.
- QRS widening of  $> 20$  ms.
- The onset of AV block (PR interval  $> 200$  ms and/or second- or third-degree AV block).
- Conduction characteristics were measured at the beginning and at the end of the CTI ablation

# CTI PFA using Centauri PEF system



## Results

- **Baseline Patient Characteristics**
  - **A total of 117 consecutive patients were enrolled between January 7, 2025, and December 31, 2025**
  - **Baseline characteristics see Table 1**
  - **CTI ablation was performed as part of complex arrhythmia procedures for the following primary dg:**
    - **De novo atrial fibrillation ablation (41.9%)**
    - **Redo atrial fibrillation procedures (49.5%)**
    - **Atypical atrial flutter (6%)**
    - **Typical atrial flutter (2.6%)**

## Results

### Basic parameters

Basic parameters	PFA CTI group N = 117
Age (years)	63 ± 11.5
Sex: female	34 (29 %)
Weight (kg)	81 ± 19
Height (m)	1.70 ± 0.08
BMI (kgm <sup>-2</sup> )	28.1 ± 5.5
LVEF (%)	60.0 (56.0–65.0)
LA (mm)	45 ± 10.5
Hypertension	89 (76 %)
Diabetes mellitus	34 (29 %)
AA medication	41 (65.1 %)
Amiodaron	15 (13 %)
Propafenon	45 (38 %)
Sotalhexal	3 (2,5 %)
Anticoagulation drugs	117 (100 %)
NOAC	117 (100 %)

## Results

### ➤ Procedural Results

- **Bidirectional CTI block - 100% of patients**
- **Average duration of the CTI ablation -  $7.0 \pm 5.9$  min.**
- **Average length of the ablation line -  $44.4 \pm 19.5$  mm**
- **Average number of ablation points -  $17.6 \pm 13.4$**
- **First-pass block - 91%**
- **Reconduction - 9%**

### ➤ Procedural Results

- **No severe conduction disturbances occurred**
  - **PR interval prolongation > 20 ms (max 52 ms) in 7.7% of patients with normalization within a few hours**
  - **No case of new second- or third-degree AV block**
  - **Mean change in PR interval for entire cohort was  $-1,5 \pm 19$  msec**
  - **Mean change in QRS duration for entire cohort was  $-0,4 \pm 6$  msec**
- **One case (0.8%) of coronary artery vasospasm with ST-segment elevations occurred, which resolved promptly after nitrate administration**

## Results

- **Procedural Results**
  - **One case (0.8%) of cardiac tamponade during an extremely complex redo procedure in both atria**
  - **Two groin complications (1.6%)**
  - **There were no instances of stroke, atrioesophageal fistula, or death**

- **The results demonstrate**
  - **Robust efficacy of CTI ablation using the Centauri system**
  - **Excellent safety despite the absence of preventive nitrate administration**
- **Our results confirm published data regarding ablations using the Farapulse system in particular<sup>1,2</sup>**
- **The discrepancy is with the only published set of patients with CTI PFA using the Centauri system<sup>3</sup>**
  - **Coronary spasm 0.8% (1/117) vs 5% (4/82)**
  - **AV conduction disturbances**
    - **Transient complete AV block 0% vs 2%, 2/82**
    - **Persistent PR prolongation > 20 ms 0% vs 5% (4/82)**

<sup>1</sup> Rodriguez-Riascos JF et al. Safety and Efficacy of Pulsed Field Ablation for Cavotricuspid Isthmus-Dependent Flutter: A Systematic Literature Review. J Cardiovasc Electrophysiol. 2025;36(8):2013-2024

<sup>2</sup> Stojadinovic P et al. Acute durability of cavotricuspid isthmus block after pulsed electric field ablation: randomized comparison of two pentaspline catheter configurations (SECTION trial). EP Europace, Volume 27, Issue 10, October 2025

<sup>3</sup> Farnir FIP et al, Ablation of cavotricuspid isthmus-dependent atrial flutter using a focal monopolar pulsed-field ablation catheter: Feasibility, periprocedural coronary spasms and conduction disorders. Heart Rhythm. 2026 Jan;23(1):105-113.

- **The reasons for the marked discrepancies in the incidence of CS and AV disturbances between our study and that of Farnir et al. remain unclear**
  - **More general anesthesia with muscle relaxation in our group 100% vs 87%**
  - **Choice of ablation catheter – Farnir use ThermoCool SmartTouch catheter (Biosense Webster), our pts were ablated using the TactiCath catheter (Abbott)**

1 Rodriguez-Riascos JF et al. Safety and Efficacy of Pulsed Field Ablation for Cavotricuspid Isthmus-Dependent Flutter: A Systematic Literature Review. J Cardiovasc Electrophysiol. 2025;36(8):2013-2024

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## Limitations

- **1. It is a single-center, retrospective analysis of the clinical cases**
- **2. Heterogeneity of the patient population**
- **3. Continuous 12-lead ECG was used for the detection of coronary spasm, coronary angiography was not routinely performed**
- **4. Long-term follow-up data regarding the durability of the CTI block are currently limited**

- **Focal pulsed field ablation (FPFA) using the Centauri PEF system is a safe and highly effective method for catheter ablation of the cavotricuspid isthmus**
- **Our study demonstrated a 100% acute success rate with a high incidence of first-pass conduction block**
- **Risk of specific PFA-related complications, such as coronary spasm and AV conduction disturbances, was significantly lower than previously reported**
- **FPFA can be performed with an excellent safety profile even without the prophylactic administration of nitrate**
- **These results support the use of focal PFA as a robust, efficient and safe alternative to conventional radiofrequency energy in standard clinical practice.**

**Děkuji za pozornost**

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