

FIBRILÁCIA PREDSIENÍ *U PACIENTKY S ALERGIOU NA HEPARÍN*

ÚSPEŠNE LIEČENÁ ABLÁCIOU PULZNÝM POĽOM (PFA)
S POUŽITÍM PRIAMEHO INHIBÍTORA TROMBÍNU
(ARGATROBAN)



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ANTICOAGULATION

Direct Thrombin Inhibitors as an Alternative to Heparin During Catheter Ablation

A Multicenter Experience

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ABSTRACT

OBJECTIVES The goal of this study was to report a multicenter series of left-sided catheter ablations performed by using intravenous direct thrombin inhibitors (DTIs) as an alternative to heparin.

BACKGROUND Amidst a looming worldwide shortage of heparin, there are insufficient data to guide nonheparin-based peri-procedural anticoagulation in patients undergoing catheter ablation.

METHODS This study reviewed all catheter ablations at 6 institutions between 2006 and 2019 to assess the safety and efficacy of DTIs for left-sided radiofrequency catheter ablation of atrial fibrillation and ventricular tachycardia.

RESULTS In total, 53 patients (age 63.0 ± 9.3 years, 68% male, CHA₂DS₂-VASc [congestive heart failure, hypertension,

Direct thrombin inhibition during pulmonary vein isolation using pulsed field ablation

Bivalirudin

PFA



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Introduction

Bivalirudin reversibly inhibits circulating and clot-bound thrombin, while also inhibiting thrombin-mediated platelet activation and aggregation with a predictable antithrombotic response.¹ Some reports have described its use during catheter-based arrhythmia ablation procedures using thermal energy, including pulmonary vein isolation (PVI) for atrial fibrillation (AF) treatment.^{2–5}

More recently, pulsed field ablation (PFA) has emerged as a promising AF ablation modality with reported stroke rates as low as 0.12% in the largest postapproval study MANIFEST-17K.⁶ We present a case of a patient with heparin allergy undergoing a PFA-based PVI procedure using intraprocedural bivalirudin.

Case report

A 72-year-old woman with hypertension and obstructive

KEY TEACHING POINTS

- Owing to its immediate onset of action and short half-life, **bivalirudin** is a well-established and evidence-based alternative to heparin during catheter-based procedures.
- The combination of pulsed field ablation–based pulmonary vein isolation procedures in atrial fibrillation and the use of bivalirudin may provide a predictable safety profile, constituting a favorable alternative to heparin.
- Further studies evaluating bivalirudin administration during ablation procedures using different pulsed field ablation systems and manufacturers would be desirable.



Literatúra – argatroban a ablácie

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- Argatroban ¼, Bivalirudín ¾ pac.
- RFA PVI a VT
- 6 centier, 13 rokov, 53 pacientov
- Bez závažných komplikácií
- Žiadna publikácia PFA PVI a argatroban
- 1 case report PFA PVI a bivalirudín

Antikoagulácia pri abláciach

Štandard:

Heparin

- bolus 100 IU/kg, potom bolus podľa ACT á 20 min
- polčas 90 min
- následne OAK – 4-6 hod. postprocedurálne

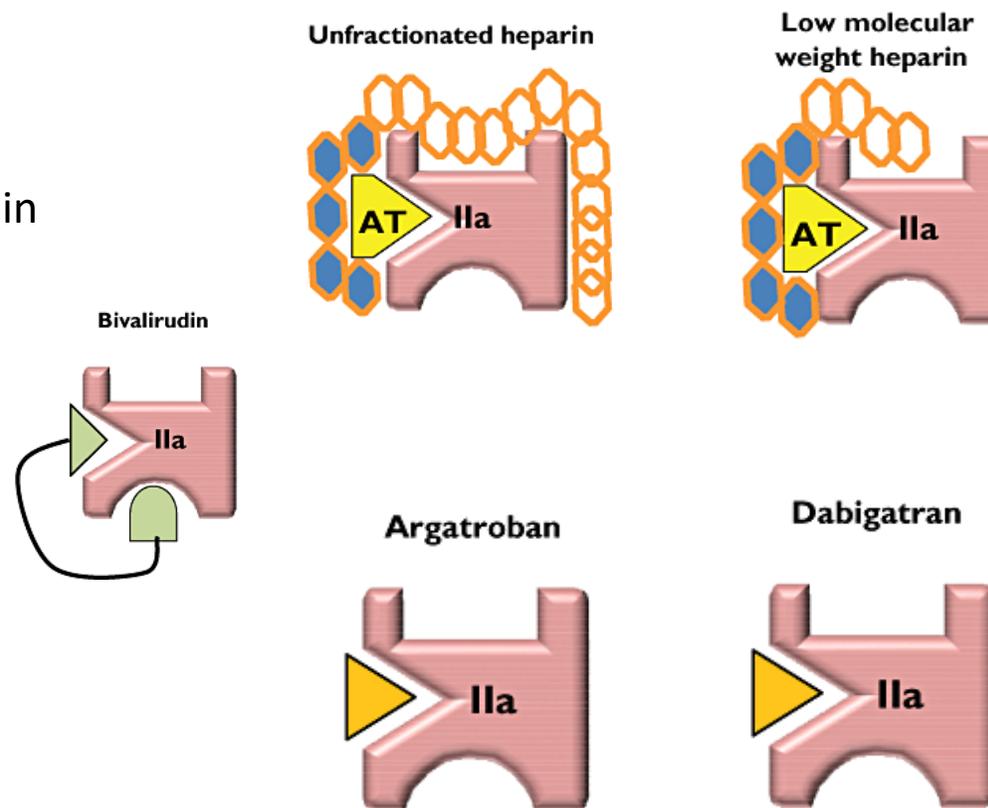
Alternatíva

Argatroban

- polčas 45 min
- metabolizmus – hepatobiliárny
- bez limitácie pri CHRI
- Následne OAK – 4-6 hod. postprocedurálne
- Nemusí sa vysádzať OAK predprocedurálne

Bivalirudín

- v SR nedostupný



Kazuistika

- *70r. žena, 169 cm, 98 kg, BMI 34*
- Perzistujúca fibrilácia + flutter predsiení, CHA2DS2VA 4, EHRA IIb
- Pri fibrilácii pokles LVEF 45%, LVEDD 52 mm, LA 47mm
- Art. Hypertenzia, Diabetes mellitus 2 typu
- Monoklonálna gamapatia, MGUS IgG - lambda



Kazuistika - *Alergie*

Alergia –exantém:

- TTC, Biseptol, Sulfometoxidín
- **Fraxiparine** (nadroparín)
- **Clexane** (enoxaparín)
- **Fragmin** (dalteparín)
- **Heparín** - závažný kožný výsev



Príprava na výkon – konzília

- **HEMATOLÓG** – NÚSCH – centrálny sklad pre Argatroban, zaistenie balení, zaslanie prepočtovej tabuľky dávkovania

Hmotnosť pac.	Pre ACT 300-450 s: bolus. dávka 350 ug/kg + iničiálna dávka inf. 25 ug/kg/min				Ak ACT < 300s: bolus. dávka 150 ug/kg + úprava dávky inf. na 30 ug/kg/min				Ak ACT > 450s: úprava dávky inf. na 15 ug/kg/min	
Do žltého políčka doplniť hmotnosť pac. v kg	Bolus dávka (ug)	Bolus dávka naried. roztoku s koncentr. 1000 ug/ml	Infúzna dávka (ug/min)	Rýchlosť infúzie (ml/hod)	Bolus dávka (ug)	Bolus dávka naried. roztoku s koncentr. 1000 ug/ml	Infúzna dávka (ug/min)	Rýchlosť infúzie (ml/hod)	Infúzna dávka (ug/min)	Rýchlosť infúzie (ml/hod)
98	34 300	34 ml	2 450	147	14 700	15 ml	2 940	176	1 470	88

- **ANESTEZIOLÓG** – liekové interakcie, skrížené alergie



Dávkovanie lieku

Cieľové ACT – 300-450s

Riedenie – jedno balenie t.j. 250mg (v 2,5ml) zriediť do 250ml FR

Iniciálna dávka 350ug/kg + infúzia 25ug/kg/min

Kontrola ACT po 10 min.

Ak ACT < 300 ms – bolus 150ug/kg + infúzia zvýšiť 30ug/kg/min

Ak ACT > 450 ms – infúzia znížiť na 15 ug/kg/min



Príprava na výkon – počet balení

- pripravené 3 balenia (t.j. na prípravu 3 x 250 ml roztoku)
- záloha 4 balenia v centrálnom sklade NÚSCH



Výkon (PFA) – reálna *spotreba lieku*

štandardná IPV + CTI (PFA Farapulse):

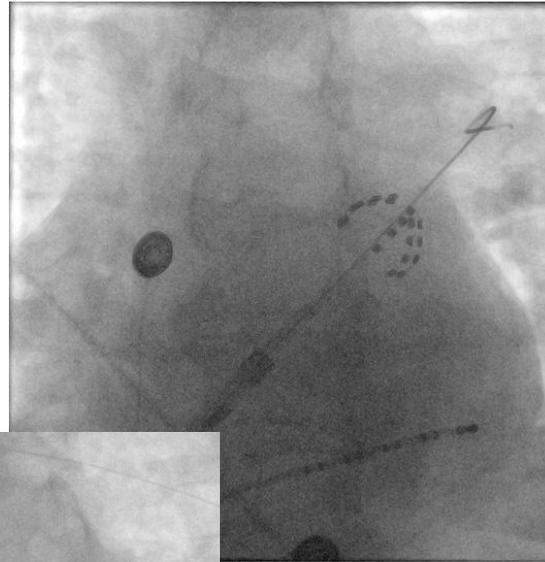
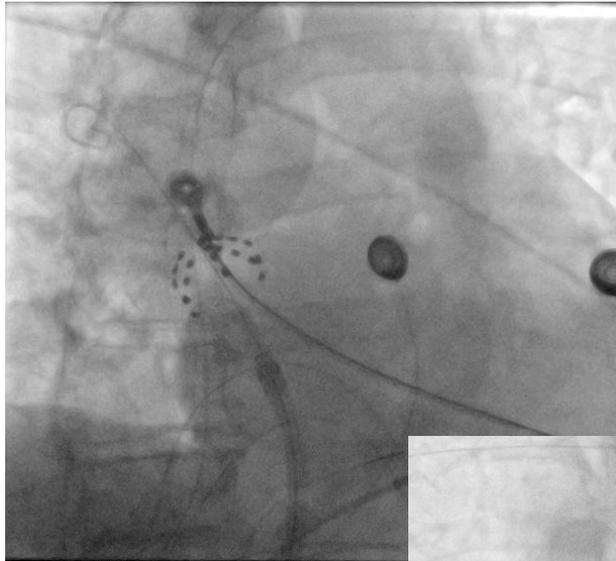
celková dávka: **19 mGy**, 290.33 $\mu\text{Gy}/\text{m}^2$, RTG čas: **6.2 min**. Čas procedúry (skin to skin) = **80min**
Krea 68...73 $\mu\text{mol}/\text{l}$ (+7%), HGB 141...121 g/l (-16%)

ZHRUNUTIE:

- Bolus 34 ml
- o 10 min...ACT 395 ms inf. 150 ml/h
- o 20 min...ACT nad 400 s redukcia 90 ml/h
- o 20 min...ACT nad 400 s ukončené podávanie
- **Spotreba Argatroban:**
- **160 ml roztoku = cca. 160 mg1 balenie**



Výkon IPV (PFA)



2x Z-steh na každej strane
,figure-of-eight' suture FoE/FO8



ZÁVER

- u pacientov s **HIT, heparínovou alergiou**, predchádzajúcou **reakciou na protamín** alebo s **religióznymi dôvodmi** existuje bezpečná alternatíva
- pri ablácii v systémovej cirkulácii sú alternatívou **priame inhibítory trombínu (DTI)**: Bivalirudín (ANGIOX) alebo Argatroban (**ARGATRA** dostupná v ČR/SR)
- u našej pacientky s heparínovou alergiou (skríženou reaktivitou) prebehol výkon PFA PVI+CTI **bez komplikácií, FU 4 mesiace** bez relev. arytmie/sympt.



d'akujem za pozornosť

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