

Catheter Ablation for Treatment of Atrial Fibrillation – 2010 and Beyond

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~ Disclosures ~

Medtronic, Inc. (Research & training support; Consultant; Lecturer)

Boston Scientific Corp. (Research & training support; Lecturer)

St. Jude Medical (Research & training support; Lecturer)

Biosense-Webster, Inc. (Training support; Lecturer)

Biotronik, Inc. (Training support; Lecturer)

Stereotaxis, Inc. (Consultant)

Our Case

59 yo businessman with palpitations, lightheadedness

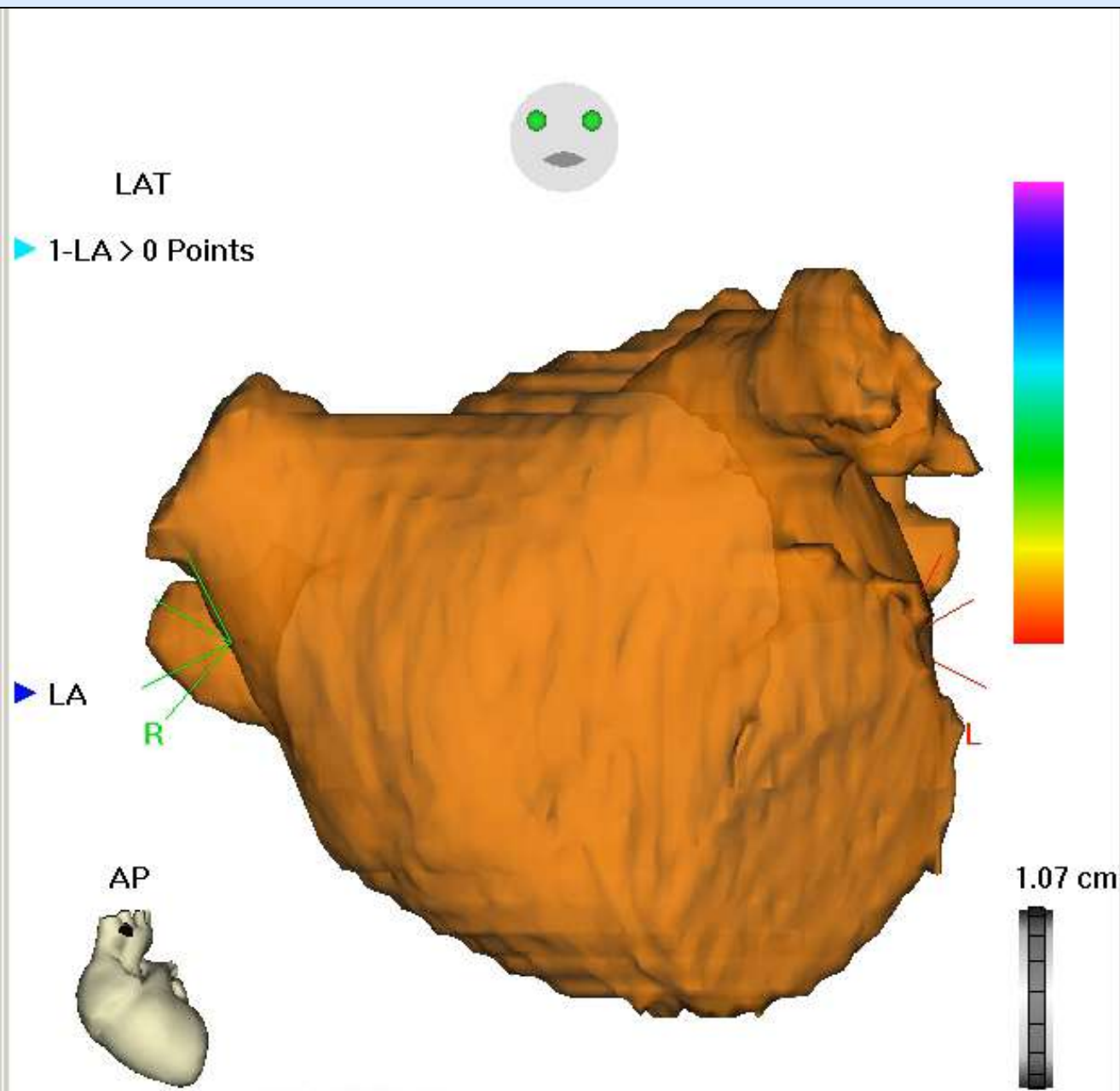
- Initially, episodes lasted 3-10 min
- Occurred without provocation; no relieving factors
- Episodes became more frequent (every few weeks), lasting longer (45 min-3 hr)
- ER visit: AF, ventricular rate 145/min
 - IV diltiazem controlled rate; converted to sinus after 4 hr
 - Routine blood work normal; thyroid panel normal
 - Echocardiogram – normal LVSF, LA size; trivial TR
 - Stress test – 12 METs, good HR/BP response; no ischemia or AF
- Referred for evaluation
 - Episodes now still more frequent and bothersome
 - No FH; no EtOH, tobacco; rare caffeine
 - No history of stroke/TIA, heart failure, severe hypertension, diabetes

Our Case

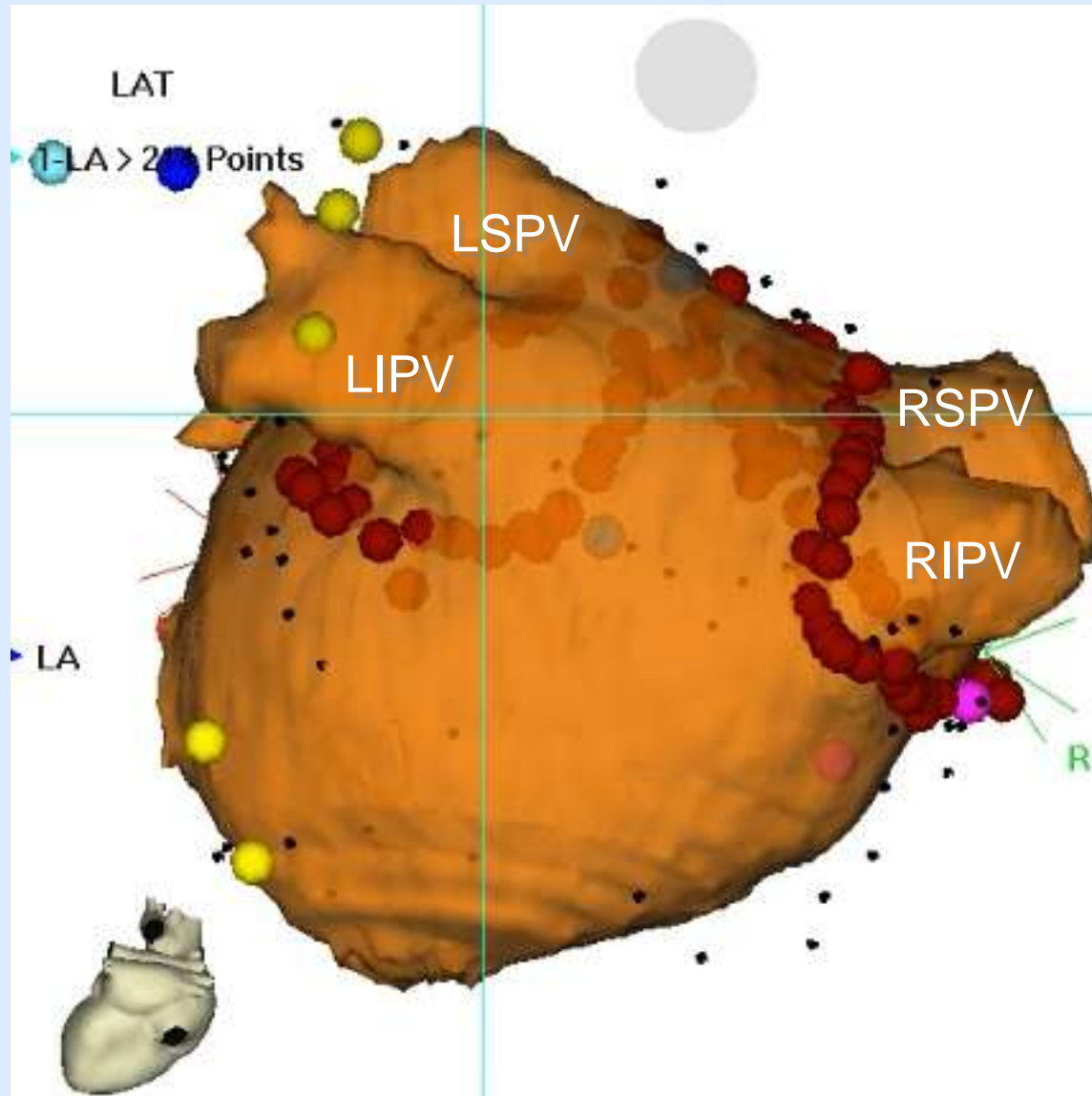
59 yo businessman with palpitations, lightheadedness

- Treated with “pill-in-pocket” propafenone; worked once (only)
- Started on sotalol – fatigue all the time, not just in AF
- Dronedaronone – possibly fewer episodes; GI upset
- Referred for consideration of catheter ablation
 - Episodes still every few weeks but lasting up to 12 hr; exhaustion during episodes (sometimes has to leave work)
 - Meds: ASA, lisinopril, simvastatin, vitamins
 - Exam: 130/70, HR 65/regular; 6 ft 0 in, 210 lb.; normal CV exam
 - ECG: NSR, no abnormalities; AF: ventricular response 140/min
 - Discussed options; decided he was ablation was reasonable option
 - Started on warfarin, CT scan obtained

CT Scan and Catheter Ablation

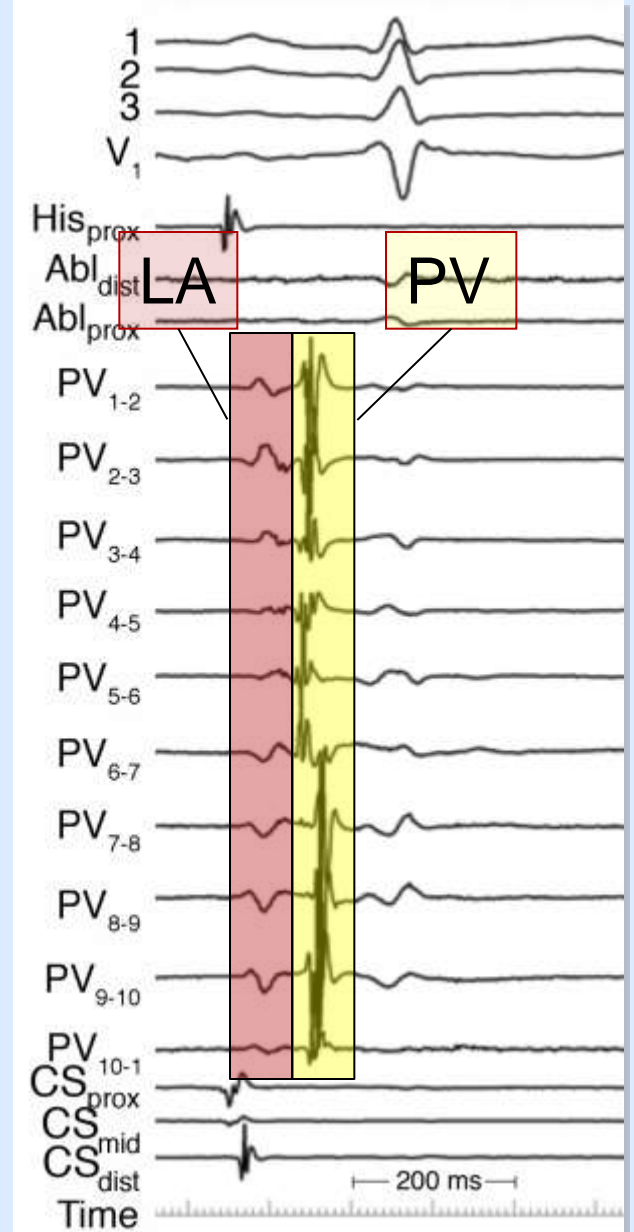
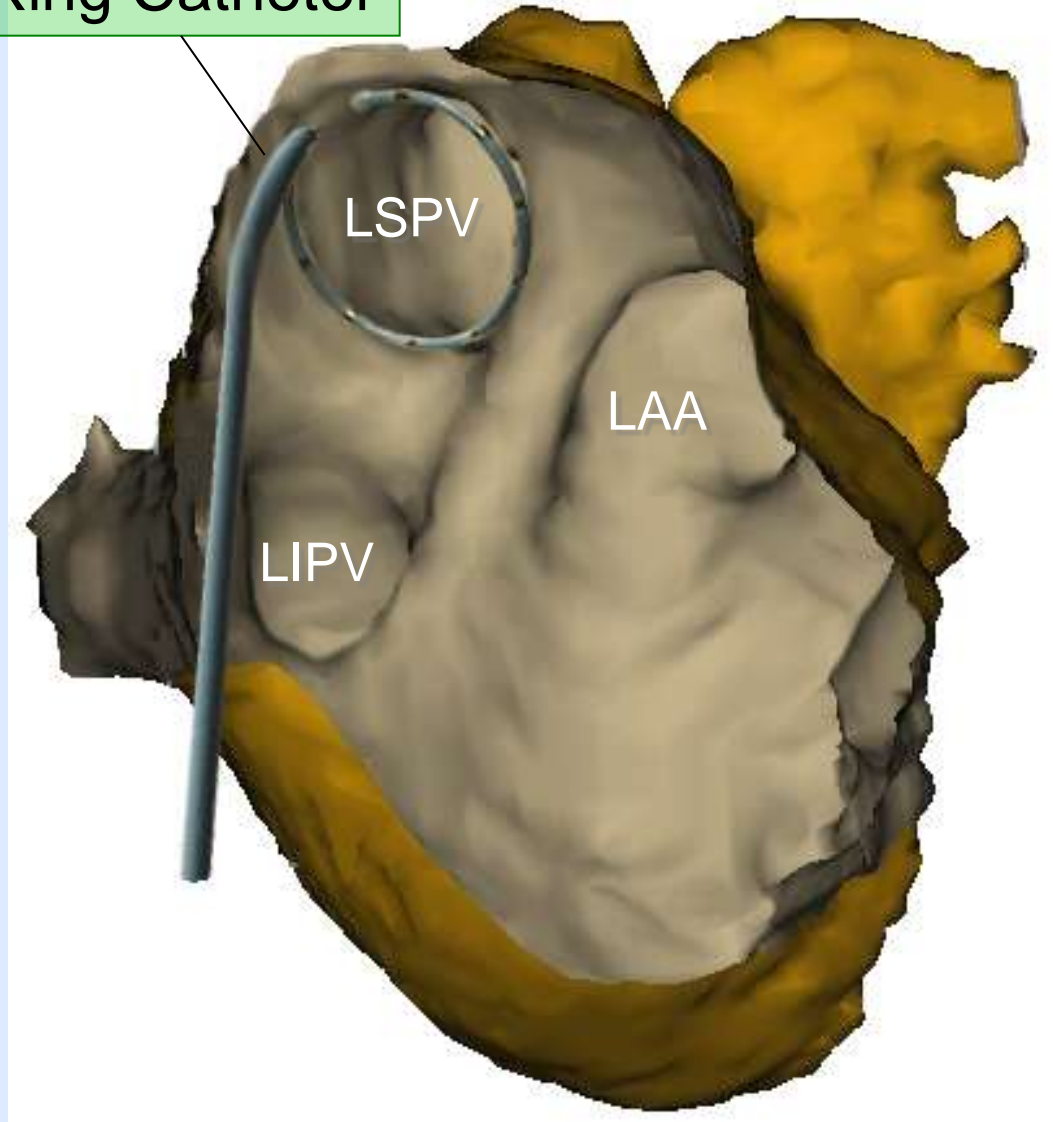


CT Scan and Catheter Ablation



Pulmonary Vein Potentials

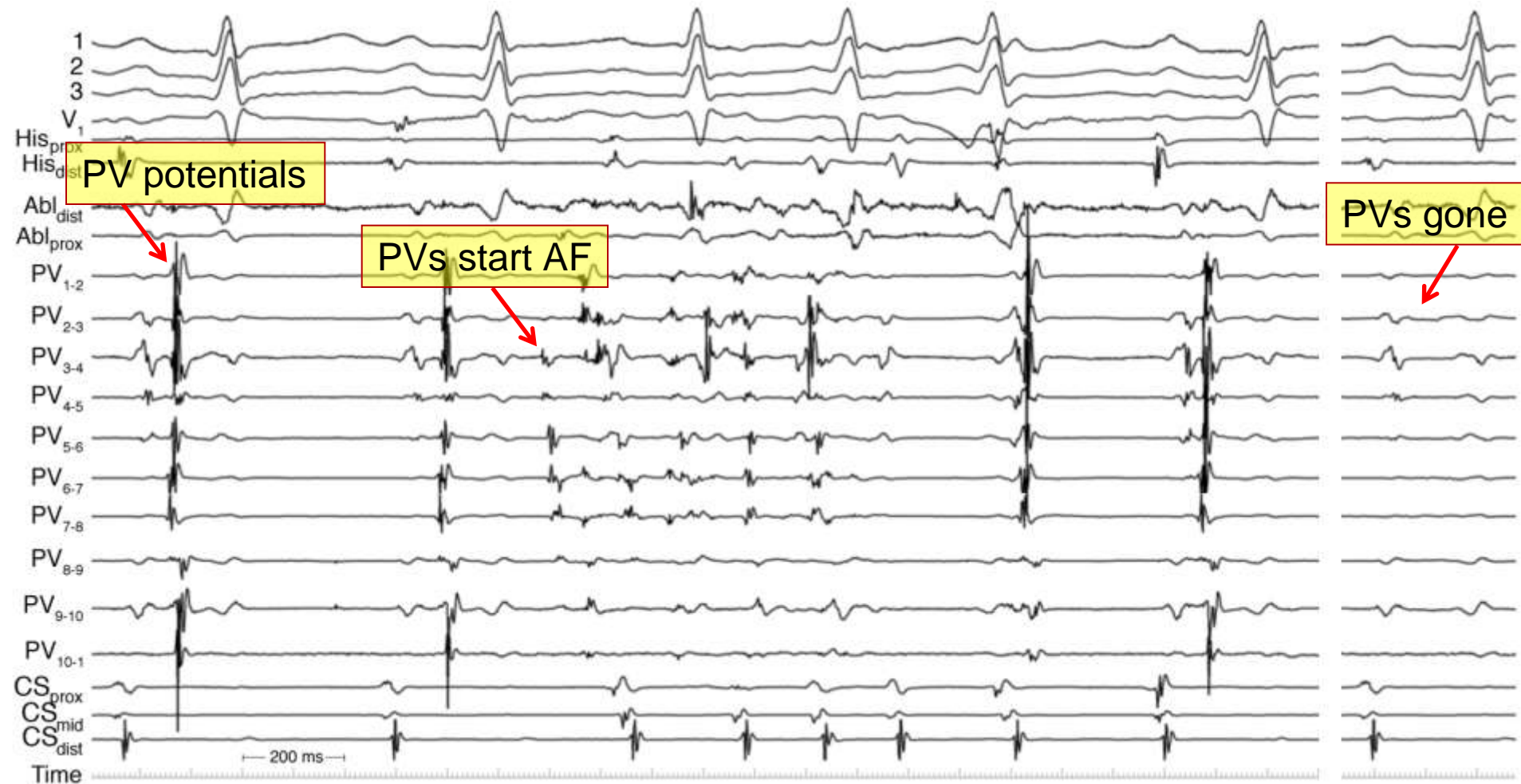
Ring Catheter



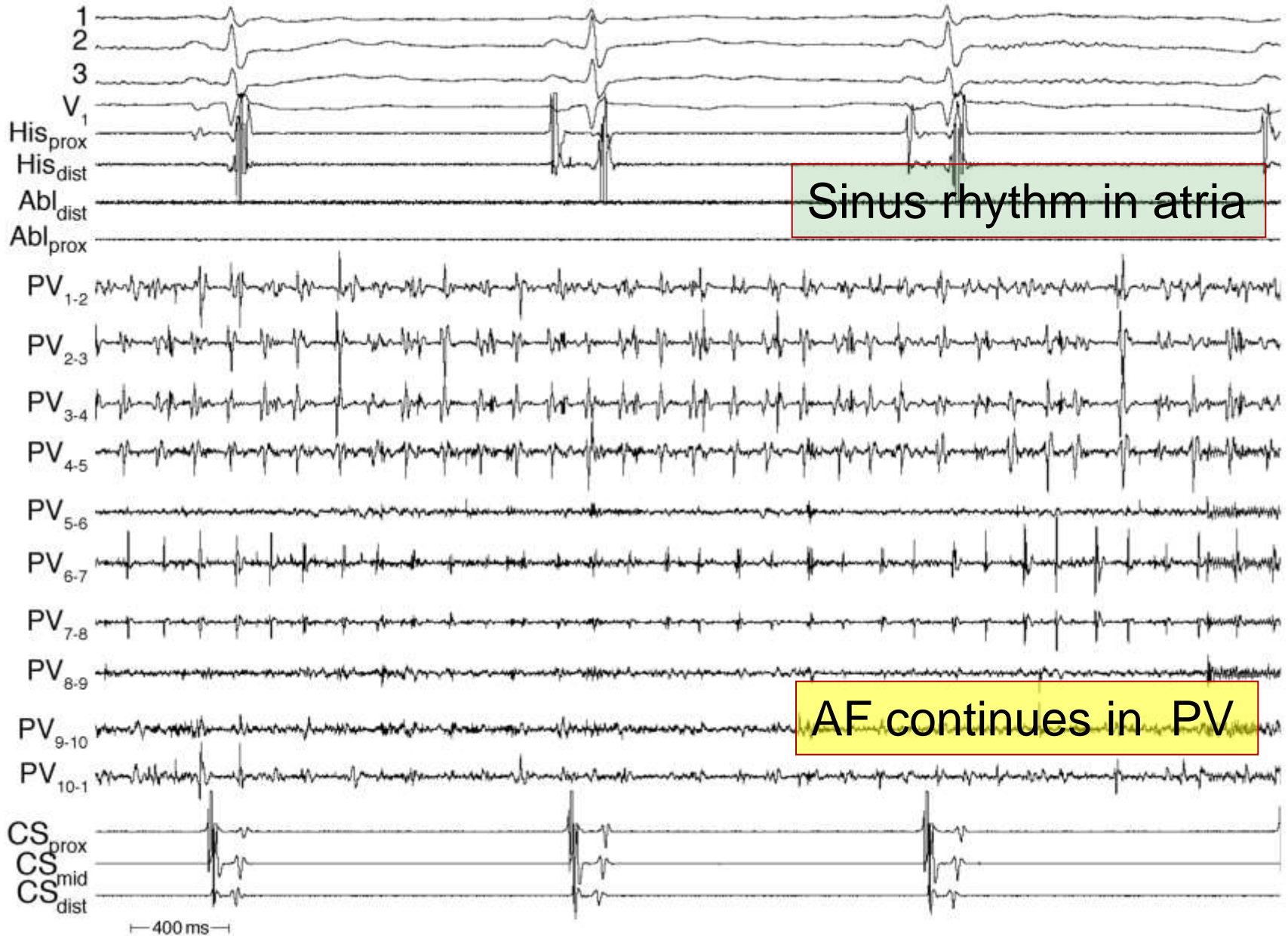
Pulmonary Vein Firing Causing AF

Left Superior PV Firing

Isolation



Right Superior Pulmonary Vein



Back to Our Case...□

Full PV isolation performed without incident

- Mild chest discomfort, went home next morning
- A few episodes of recurrent palpitations for 3 wk
- Thereafter, no further palpitations
- Event monitor: sinus rhythm, rare PVC
- Warfarin discontinued 2 months post-ablation
- Has continued to be asymptomatic, active

Outcomes of AF Catheter Ablation

Paroxysmal AF –

- Symptomatic episodes: ~75% success, 10% late recurrence
- Asymptomatic episodes: ~50% success
- Failure due to:
 - Inability to completely isolate veins (rare)
 - Recurrence of conduction in isolated vein(s)
 - Isolation complete (or irrelevant) – AF arising from non-PV sources

Persistent or “permanent” AF –

- Symptomatic episodes: ~60% success, 15% late recurrence
- Asymptomatic episodes: ~35% success

A substantial proportion of highly symptomatic patients prior to procedure have a dramatic reduction in, or elimination of, most symptoms after apparent electrically unsuccessful ablation

Complications of AF Catheter Ablation

During procedure –

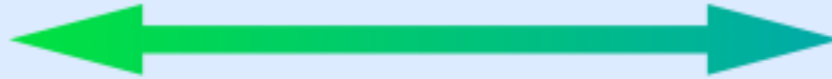
- Thromboembolism/stroke – 1%
- Perforation/tamponade - <2%
- AV block - <1%
- Phrenic nerve palsy - <1%
- Bezold-Jarisch reflex – 2%
- Air embolism - <1%
- MI, vagal denervation, mitral valve damage, death - <<1%

Following procedure –

- Thromboembolism – 1%
- Pulmonary vein stenosis – 1%
- Atrio-esophageal fistula - <<0.5%
- New atrial arrhythmias – 5-15%

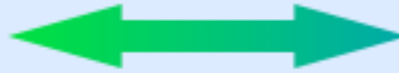
Catheter Ablation of AF: Patient Selection

Young



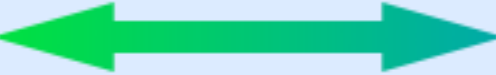
Elderly

Structurally normal heart



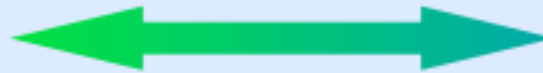
Heart disease/large LA

Frequent paroxysmal AF



Permanent AF

Highly symptomatic



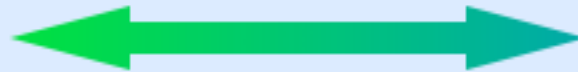
Minimal symptoms

Drug-refractory or
intolerant



Drug-naïve or
responsive

No procedural
contraindication



Procedural
contraindication



Summary

Insights into pathophysiology of AF → new therapies

- Pulmonary veins as frequent source of AF → PV isolation
- Atrial-specific ion channels as targets of drug therapy

Catheter ablation for treatment of AF

- Good results, but not perfect
- Good safety, but not perfect
- Stay tuned for new developments:
 - Better methods for locating non-PV sources of AF
 - More effective means for permanent isolation/ablation
- For highly symptomatic patients of all types of AF, ablation is a reasonable present strategy