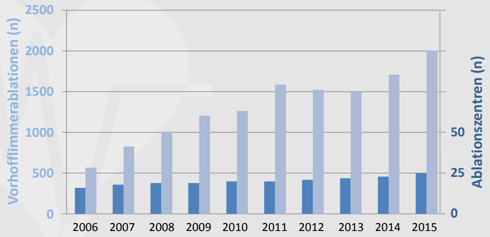
Moderne Techniken und Effektivität der Ablation von Vorhofflimmern

Sven Reek, Aarau

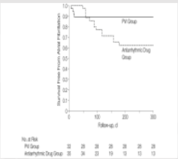
No disclosures

Vorhofflimmerablationen Schweiz

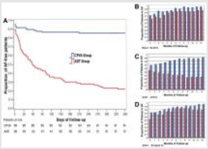


CHPACE WEB, accessed Oct 2016

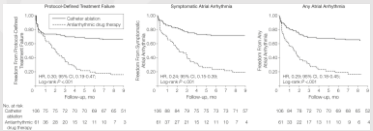
Klinischer Erfolg
Ablation vs. medikamentöse Therapie



Wazni OM, 2005

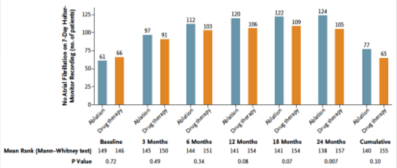


Pappone C, 2006

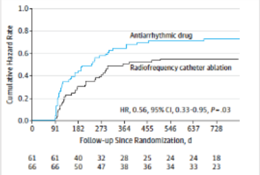


Wilber D, 2010

Klinischer Erfolg
Ablation als first-line Therapie



Cosedis Nielsen, 2012



Morillo CA, 2014

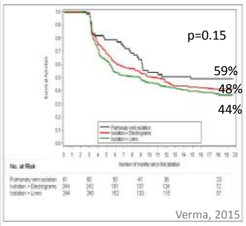
Klinischer Erfolg
Paroxysmal vs. persistent vs. long-standing persistent AF

			Success Without AADs		Success With AADs		Overall Success	
Type of AF	No. of Centers	No. of Patients	No. of Patients	Rate, Median (Interquartile Range)*	No. of Patients	Rate Median (Interquartile Range)*	No. of Patients	Rate Median (Interquartile Range)*
Paroxysmal	85	9590	6580	74.9 (64.9–82.6)	1290	9.1 (0.2–14.7)	7870	84.0 (79.7–88.6)
Persistent	73	4712	2800	64.8 (52.4–72.0)	595	10.0 (0.8–15.2)	3395	74.8 (66.1–80.0)
Long-lasting	40	1853	1108	63.1 (53.3–71.4)	162	7.9 (0.9–15.9)	1270	71.0 (67.4–76.3)

*Median and interquartile range are calculated using center as unit of analysis.

Cappato, 2009

- PVI ist Grundpfeiler der Vorhofflimmerablation
- “…more extensive LA ablation may be needed…”
  - Lineare Ablationen
  - Komplexe fraktioniert ale Elektrogramme
  - Ganglien
  - (Rotors)



p=0.15

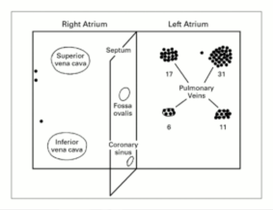
59%

48%

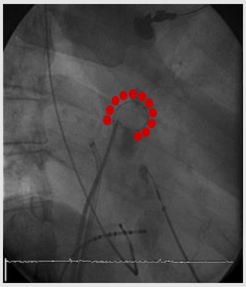
44%

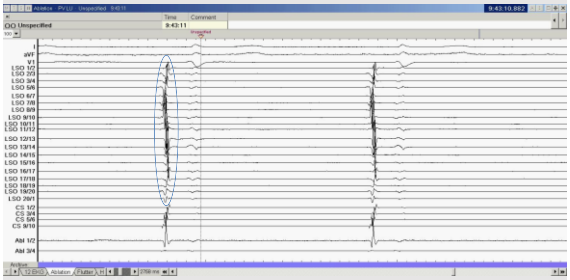
Verma, 2015

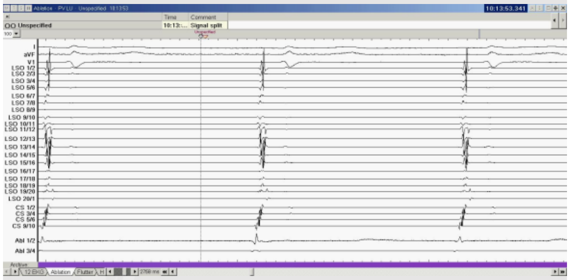
Vorhofflimmerablation = Pulmonalvenenisolation



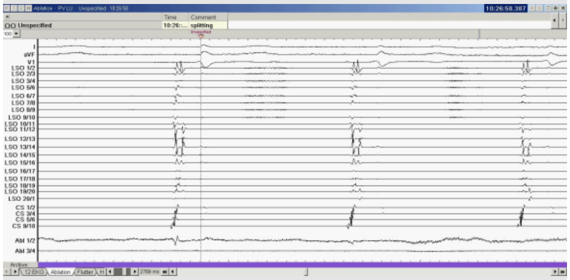
Haïssaguerre, 1998



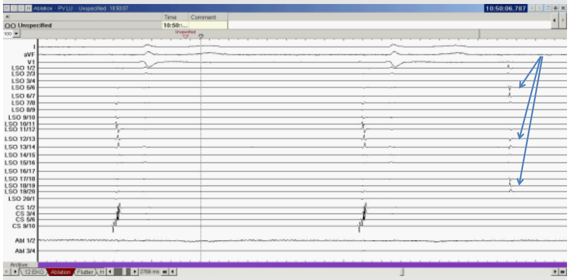

9:43:10.882
OO Unspecified
Time
Comment
9:43:11
I
aVF
V1
LSO 1/2
LSO 2/3
LSO 3/4
LSO 5/6
LSO 6/7
LSO 7/8
LSO 8/9
LSO 9/10
LSO 10/11
LSO 11/12
LSO 12/13
LSO 13/14
LSO 14/15
LSO 15/16
LSO 16/17
LSO 17/18
LSO 18/19
LSO 19/20
LSO 20/1
CS 1/2
CS 3/4
CS 5/6
CS 9/10
Abl 1/2
Abl 3/4
12 EKG
Ablation
Flutter


10:13:53.341
OO Unspecified
Time
Comment
10:13:...
Signal split
12 EKG
Ablation
Flutter

„going“

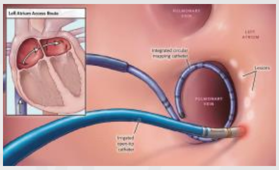

10:26:58.387
OO Unspecified
Time
Comment
10:26:...
splitting
12 EKG
Ablation
Flutter

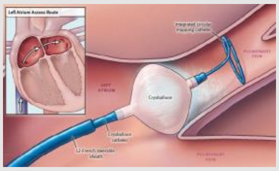
„going“


10:50:06.767
OO Unspecified
Time
Comment
10:50:...
12 EKG
Ablation
Flutter

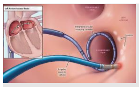
„gone“

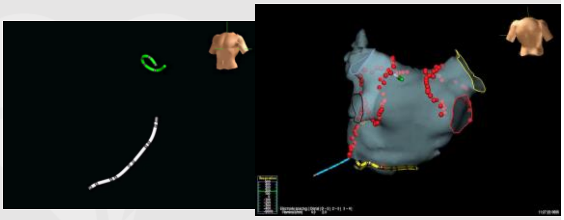
Fire or Ice?


Left Atrium Access Route
PULMONARY VEIN
LEFT ATRIUM
Integrated circular mapping catheter
Lesions
PULMONARY VEIN
Irrigated open-tip catheter

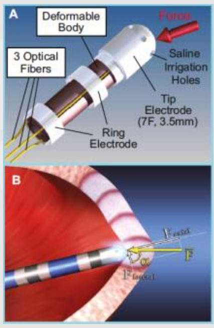

Left Atrium Access Route
Integrated circular mapping catheter
PULMONARY VEIN
LEFT ATRIUM
Cryoballoon
Cryoballoon catheter
12-French steerable sheath
PULMONARY VEIN

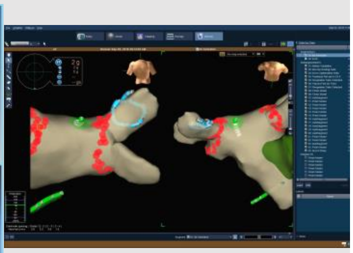
Kuck KH, 2016

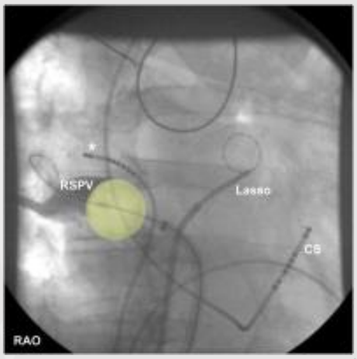




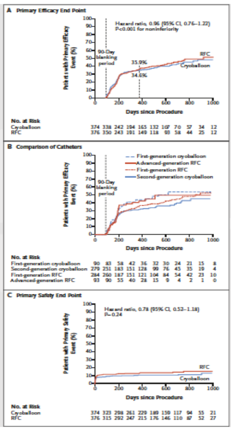
Direct contact force measurement


A
Deformable Body
Force
3 Optical Fibers
Saline Irrigation Holes
Tip Electrode (7F, 3.5mm)
Ring Electrode
B
F
α




RSPV
Lasso
CS
RAO

Fire and Ice!

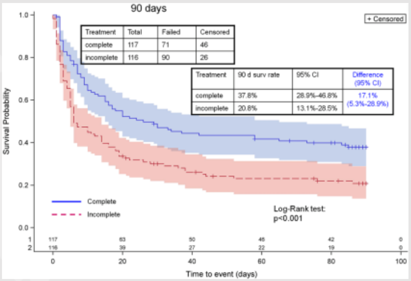


Kuck KH, 2016

- Ziel der Katheterablation von Vorhofflimmern ist die Pulmonalvenenisolation
- RF Ablation oder Cryoballon

ESC Guidelines 2016

Complete vs. incomplete PVI

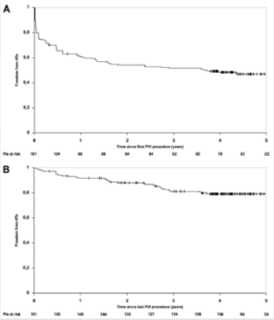


Treatment	Total	Failed	Censored
complete	117	71	46
incomplete	116	90	26

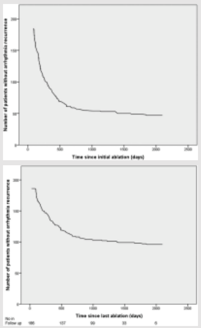
Treatment	90 d surv rate	95% CI	Difference (95% CI)
complete	37.8%	28.9%-46.8%	17.1% (5.3%-28.9%)
incomplete	20.8%	13.1%-28.5%	

Kuck, 2016

„Langzeit"- Ergebnisse

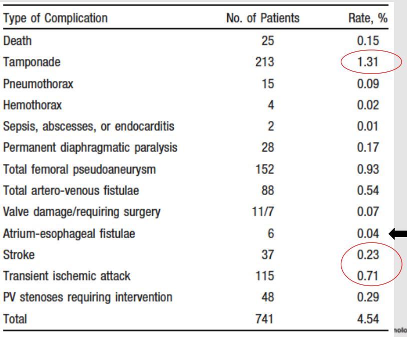


Ouyang, 2010



Wynn, 2016

Komplikationen



Type of Complication	No. of Patients	Rate, %
Death	25	0.15
Tamponade	213	1.31
Pneumothorax	15	0.09
Hemothorax	4	0.02
Sepsis, abscesses, or endocarditis	2	0.01
Permanent diaphragmatic paralysis	28	0.17
Total femoral pseudoaneurysm	152	0.93
Total artero-venous fistulae	88	0.54
Valve damage/requiring surgery	11/7	0.07
Atrium-esophageal fistulae	6	0.04
Stroke	37	0.23
Transient ischemic attack	115	0.71
PV stenoses requiring intervention	48	0.29
Total	741	4.54

Cappato, 2010

Atrio-ösophageale Fistel

- Typisch: 7-30 Tage nach Intervention
- **„Klassische“ Symptom-Trias**
  - **Fieber und Infektionszeichen ohne klaren Fokus**
  - **Retrosternale Schmerzen**
  - **TIA/Insult**

Zusammenfassung

- Komplette PVI ist Grundlage der Katheterablation von Vorhofflimmern.
- RF Energie oder Cryoballon resultieren in vergleichbaren Ergebnissen.
- Kathterablation ist effektiver als Antiarrhythmika.
- Der klinische Erfolg für den individuellen Pat. ist schwer vorhersagbar.
  - Prediktoren: Alter, strukturelle Herzkrankheit, Arrhythmieanamnese, Typ des Vorhofflimmerns, ...
- Ablation sollte früh im Krankheitsverlauf evaluiert werden.
- Viele Patienten benötigen mehr als eine Intervention.
- Späte und sehr späte Rezidive sind möglich.
- **Nur OAK verbessert Prognose!**