Accessory pathway ablation challenging case of in AVRT.

BY

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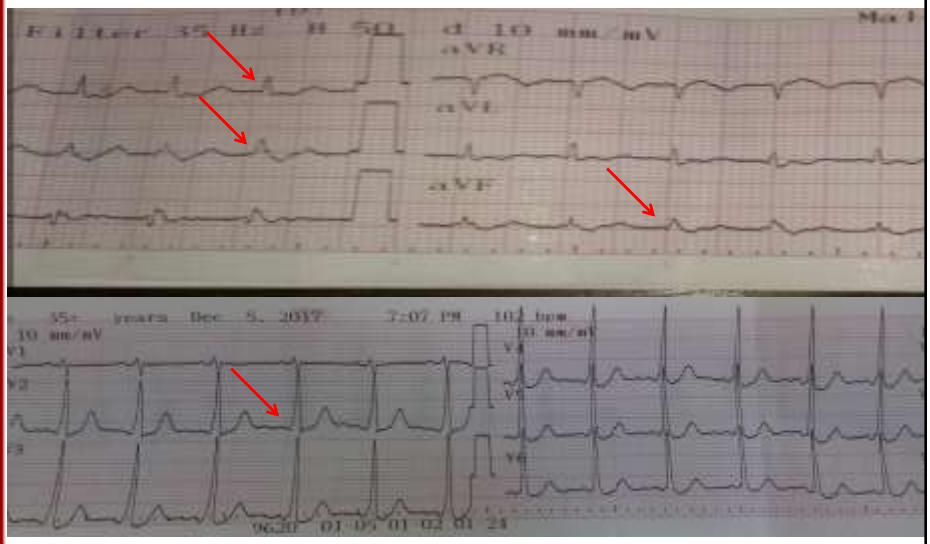
Male patient 27 yrs, not known to be DM, HTN nor Cardiac before .

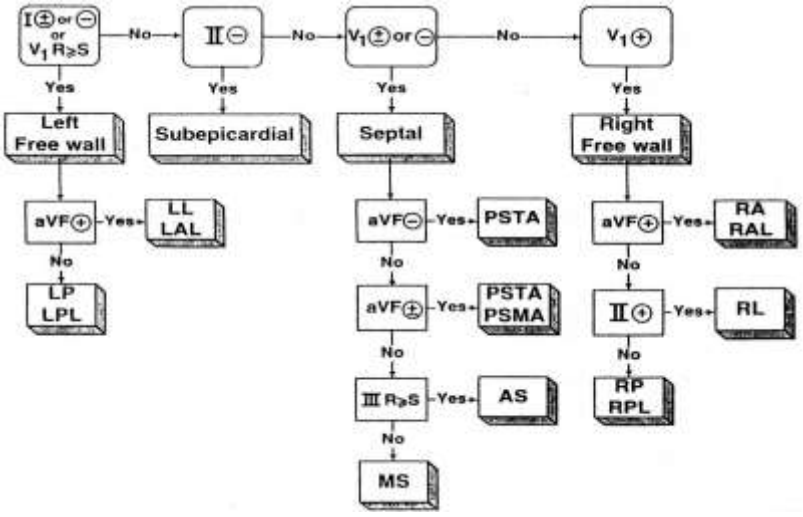
Patient complains of palpitation of one year duration (sudden onset ,sudden offset associated with dizziness and presyncope but no definite syncope)

Clinical examination >>clinically free

ECG



Arruda Stepwise ECG algorithm



Echocardiography >>Normal Echo finding

Holter monitoring : No documented tachycardia

So it is a case of pre-excited ECG without documented tachycardia

Recommendations for Management of Asymptomatic Patients With Asymptomatic Pre-Excitation

COR	LOE	Recommendations
I	B-NR [SR] C-LD [SR]	1. In asymptomatic patients with pre-excitation, the findings of abrupt loss of conduction over a manifest pathway during exercise testing in sinus rhythm.[294–297] *(Level of Evidence: B-NR)* [SR] or intermittent loss of pre-excitation during ECG or ambulatory monitoring[297] *(Level of Evidence: C-LD)* [SR] are useful to identify patients at low risk of rapid conduction over the pathway. Noninvasive testing has been shown to identify patients at low risk of developing rapid conduction over the accessory pathway and life-threatening ventricular arrhythmias in response to AF. The noninvasive findings that identify a pathway not capable of maintaining rapid conduction during AF include intermittent loss of conduction over the accessory pathway on the resting ECG or during ambulatory monitoring, or abrupt loss of pre-excitation during exercise testing (Figure 16).[294–297] The ECG should be evaluated closely to make certain the delta wave is truly absent, as accessory pathways, especially left lateral pathways, may demonstrate varying degrees of pre-excitation because of fusion between conduction over the accessory pathway and through the AV node. This may give the appearance of loss of pre-excitation if the subtle delta wave is not identified. Noninvasive tests have an approximately 90% positive predictive value and 30% negative predictive value for identifying pathways with life-threatening properties.[294,295,297]

See Online Data Supplements 11 and 12.

Stress ECG done but patient stopped at stage III due to fatigue and leg pain (heart rate not exceed 110 b/m and still preexcitated). .

What is 2nd next step??

IIa | B-NR [SR]

See Online Data Supplements 11–15.

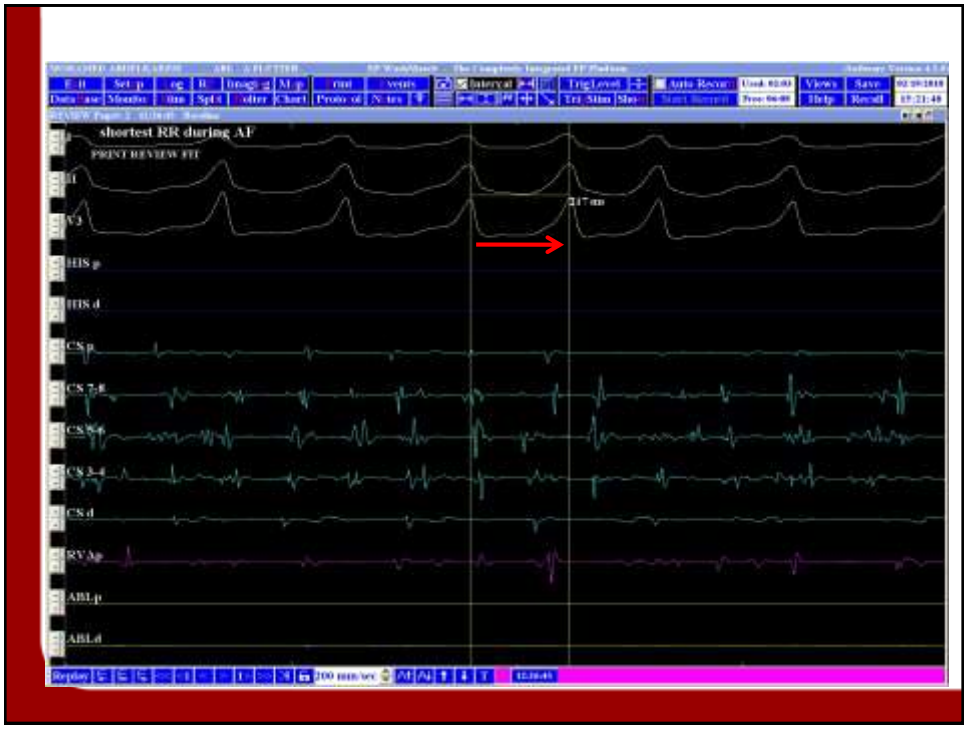
1. An EP study is reasonable in asymptomatic patients with pre-excitation to risk-stratify for arrhythmic events.[254,256,298–301]

In the absence of symptoms, a clinical priority is identifying accessory pathways at increased risk of arrhythmic events, including rapid conduction during AF and development of life-threatening ventricular arrhythmias, with the most useful findings being the following: an R-R interval <250 ms between 2 pre-excited complexes during induced AF; the presence of multiple accessory pathways; the ability to induce sustained AVRT; the finding of AVRT precipitating pre-excited AF; and an accessory pathway refractory period <240 ms.[254,256,298,299,301] Malignant arrhythmias correlate more with the EP properties of the accessory pathway than with the presence or absence of symptoms. This approach is supported by the low risk of complications observed in an EP study in which complication rates among 2,169 patients ranged from 0.09% to 1% and included pneumothorax and access site complications.[254]

So Patient was taken to EP lab .

During catheter insertion patient developped AF.

Patient received DC.



Catheters were inserted and baseline study done
Earlist activation at C7,8

Retrograde Curve was done with induction of tachycardia

So is it oblique accessary pathway or more than one accessary pathway

Oblique AP identified by a change of the local-VA or AV interval as a result of reversing the direction of paced ventricular and atrial wave fronts (*Philips B etal,2012*)

Multiple APs are identified during the electrophysiologic study by

(1) the occurrence of different patterns of preexcitation during atrial pacing or atrial fibrillation with different delta wave morphologic and ventricular activation patterns

(2) different sites of atrial activation during right ventricular pacing or orthodromic reciprocating tachycardia;

(3) preexcited tachycardia using a second pathway as the retrograde limb of the circuit

(4) mismatch between the atrial and ventricular ends of the AP as assessed by comparing antidromic and orthodromic reciprocating tachycardia (mismatch distance, >1 cm); and

(5) change from orthodromic to antidromic reciprocating tachycardia, or vice versa(*Di B iase L etal 2o12*)

So decision was to proceed to retrograde approach

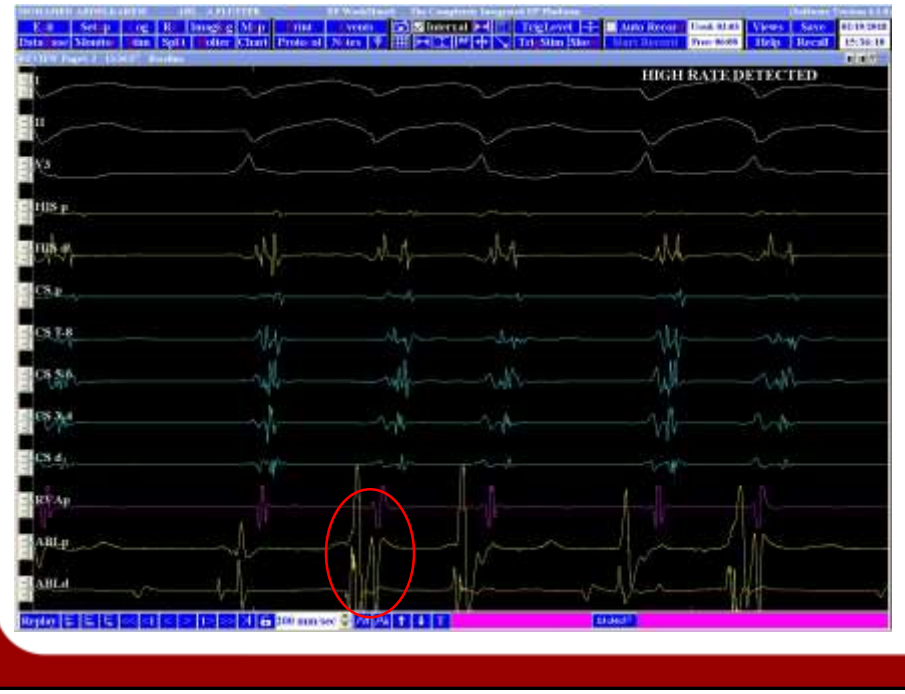
Right Side Favored	Left Side Favored
Difference between VA at His and earliest VA in CS < 25 ms	Difference between VA at His and earliest VA in CS > 25 ms
Long-RP tachycardia	Earliest retrograde atrial activation in ORT at middle CS
Negative delta wave in V_1*	R > S wave in V_1
Earliest VA < 15 mm from CS os	Earliest VA > 15 mm from CS os
Sharp/blunt CS EGM at earliest retrograde site†	Blunt/sharp CS EGM at earliest retrograde site

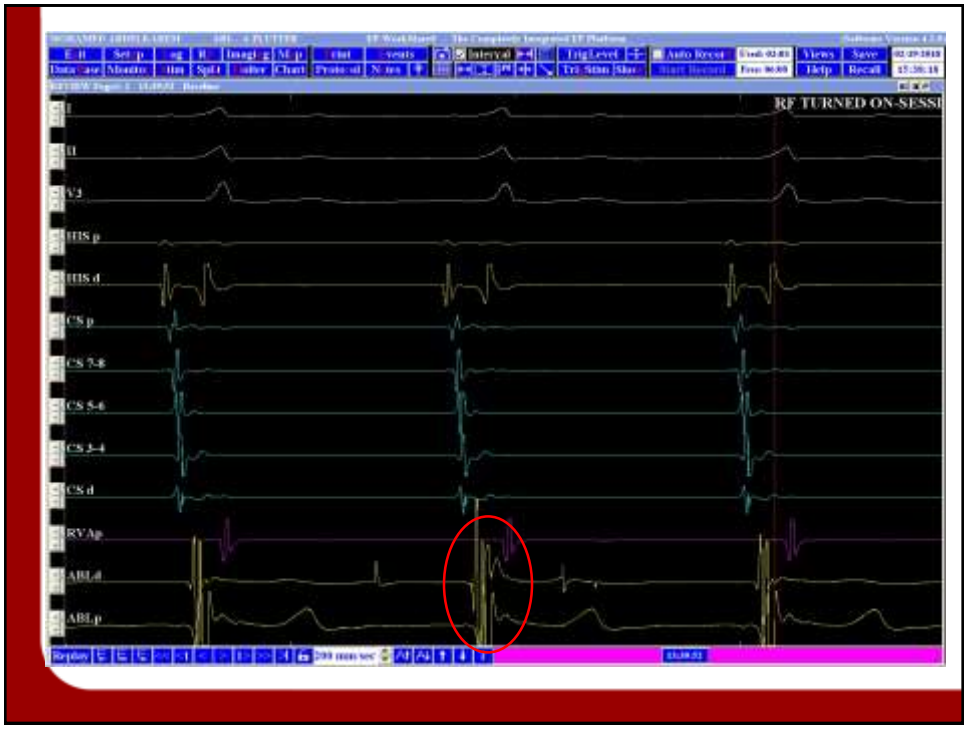
But again patient develop AF

Patient again received DC twice.

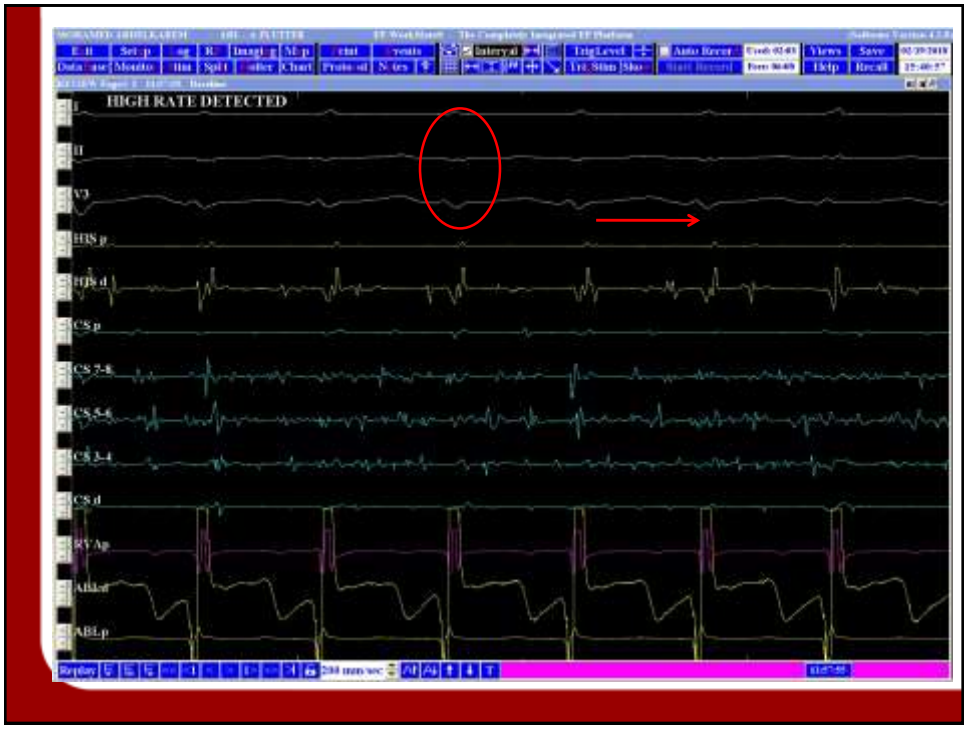
Mapping started and again tachycardia

Several ablation sites with excellent signals were tried With repeated induction of tachycardia and AF.

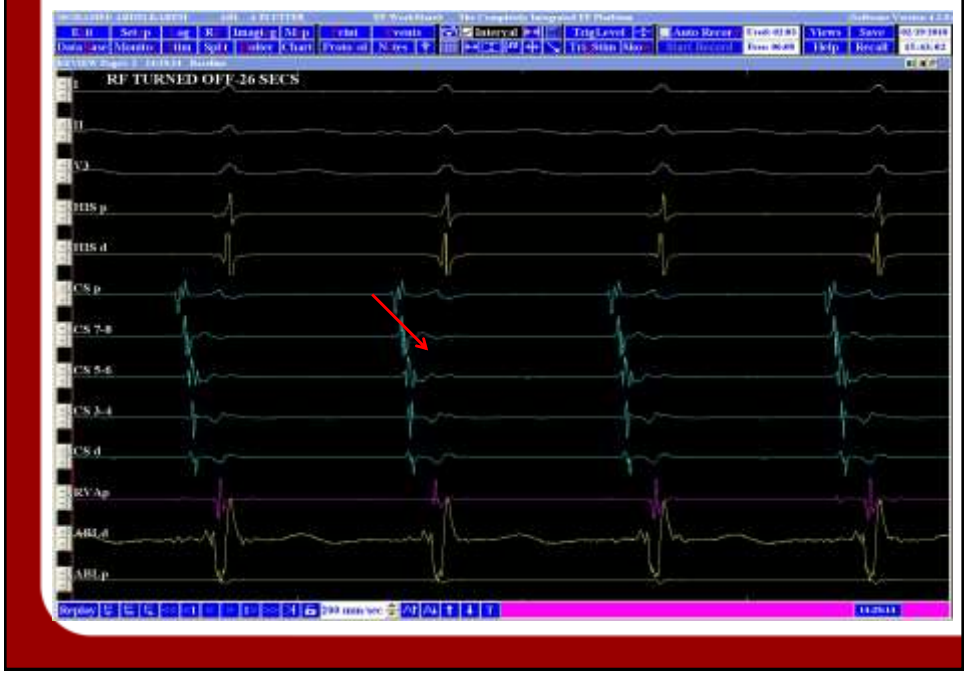



RF TURNED ON-SESSI
I
II
V3
HIS p
HIS d
CS p
CS 7-8
CS 5-6
CS 3-4
CS d
RVAp
ABL d
ABL p

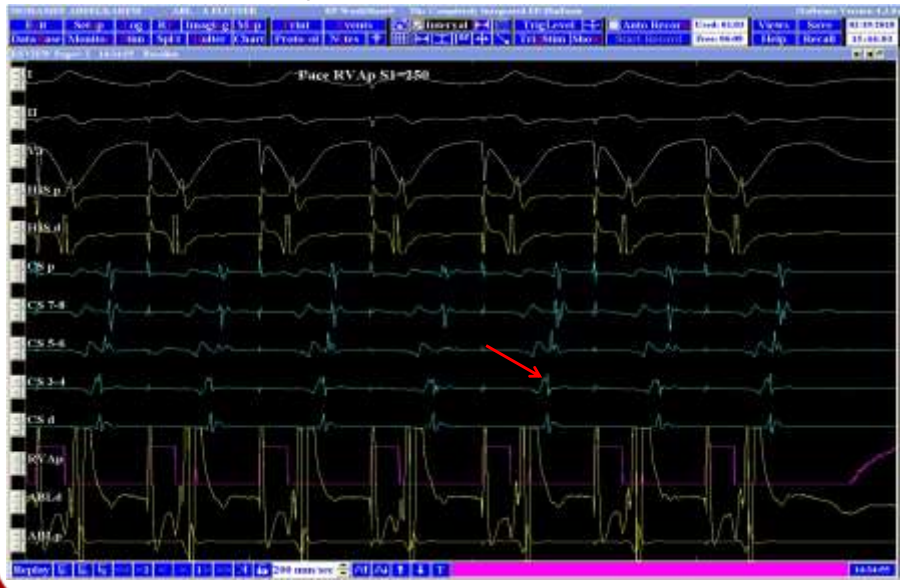

HIGH RATE DETECTED
I
II
V3
HIS p
HIS d
CS p
CS 7-8
CS 5-6
CS 3-4
CS d
RVAp
ABL d
ABL p



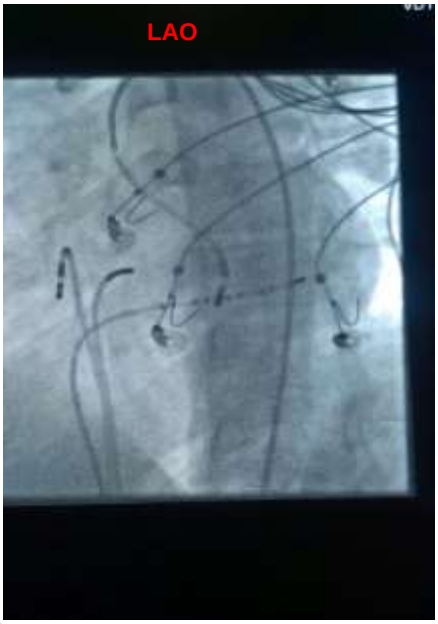
Another ablation site with separation of A & V .

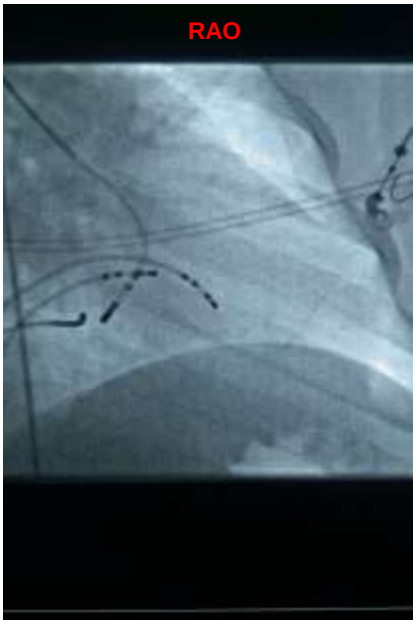


But retrograde RV pacing still showed eccentric activation with earliest A at C1,2

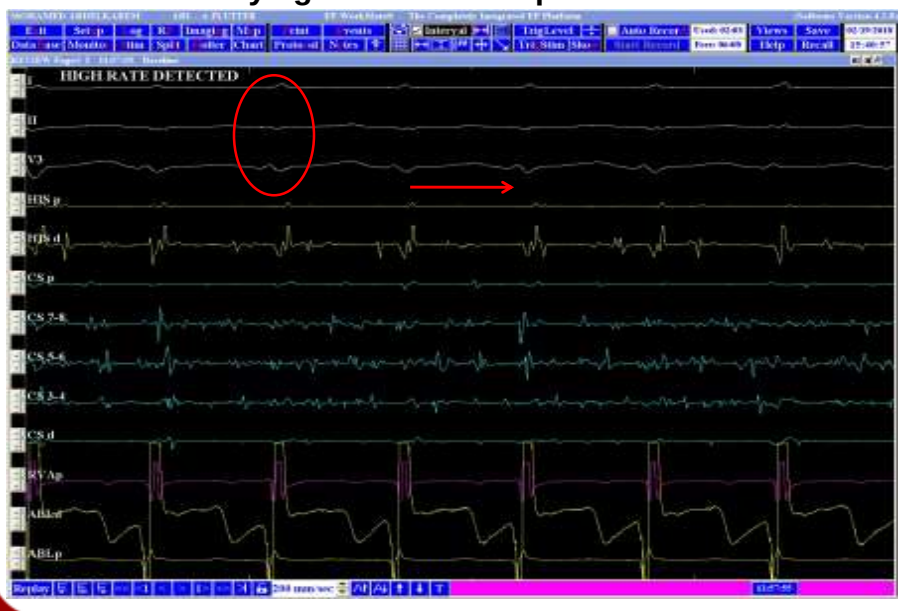


Finally successful ablation of AP





Unfortunately again AF but not preexcited



-Patient received DC 3 times and still AF .

-Patient admitted to CCU and received IV Amidarone 24 hr.

-On the next Day returned to own rhythm.

There are several mechanisms for AF in WPW patients

1- spontaneous degeneration of AVRT into AF

2- Electrical properties of the AP

3-The effects of AP on atrial architecture

4-The influence of advancing age

5- Intrinsic atrial muscle vulnerability.

The existence of a retrograde ***multiple or multifiber AP*** is strongly related to AF inducibility, and the complex excitation inputs into the atrium over the retrograde multiple or multifiber AP facilitate the development of AF in WPW patients.

But What is long term prognosis of AF in this patient??

How about AF ablation in this patient ???

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CLINICAL RESEARCH
Electrophysiology and ablation

Radiofrequency ablation of accessory pathways in patients with the Wolff–Parkinson–White syndrome: the long-term mortality and risk of atrial fibrillation

Rune Borregaard[1]*, Peter Lukac[1], Christian Gerdes[1], Dorthe Møller[2], Peter Thomas Mortensen[1], Lars Pedersen[3], Jens Cosedis Nielsen[1], and Henrik Kjærulf Jensen[1]

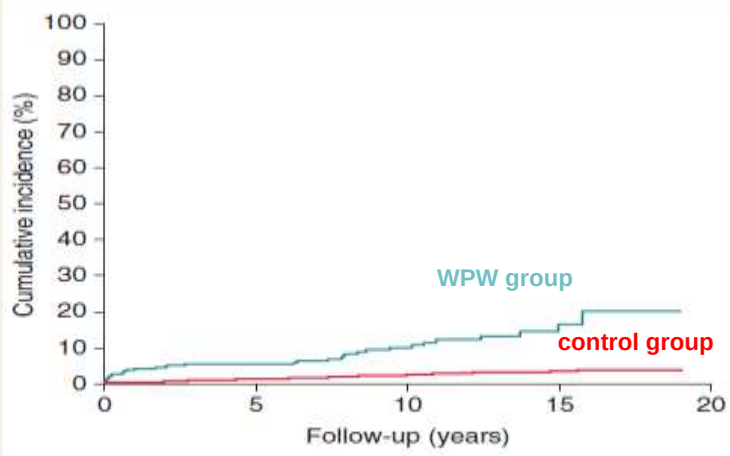

Figure 2 Blue: Cumulative incidence of atrial fibrillation in the WPW population after ablation of the AP. Red: Cumulative incidence of atrial fibrillation in the comparison cohort.

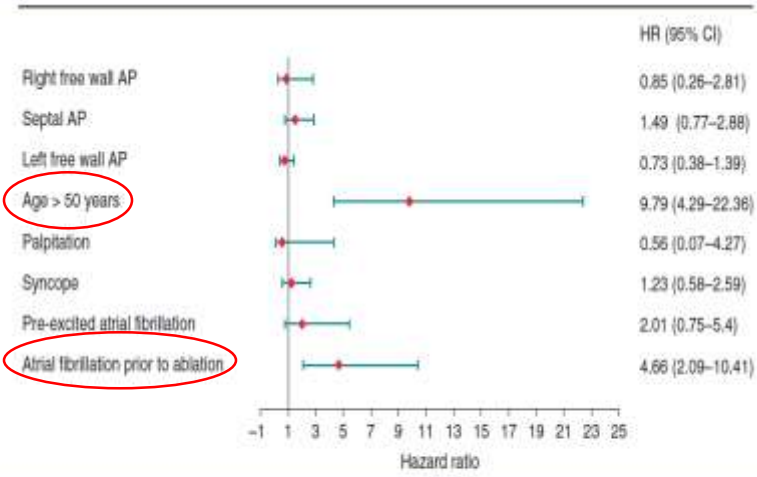

Figure 3 Predictors of post-ablation atrial fibrillation: a stratified adjusted analysis of the WPW group showing HRs and CIs of the comorbidity-adjusted risk of post-ablation medical contact caused by atrial fibrillation. A HR of >1 indicates an increased risk of atrial fibrillation in the subgroup.

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Conclusion

This study contributes with knowledge of long-term outcome after ablation of the AP in the WPW syndrome. The procedure is reasonably safe and does not seem to have long-term adverse effects. Ablation of the AP in the WPW syndrome does not seem to protect against the occurrence of atrial fibrillation after the ablation. When treating a patient aged 50 or more with verified atrial fibrillation and WPW syndrome, a future approach might be a combination of an AP ablation and a pulmonary vein antrum isolation. This issue, however, must await future studies.

Conclusion

-AP may be extended or has more than one insertion site or be oblique .

-Recurrent AF is challenge during ablation of SVT especially if cause hemodynamic instability.

-Combination of accessary pathway ablation and pulmonary vein isolation may be future plan

Many thanks