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Current trends in outcome of thermal catheter ablation for accessory pathways: A retrospective, single center study of 500 children and adults

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Abstract

Purpose

This study aimed to describe updated trends in patient characteristics, procedure efficacy and safety in patients with accessory pathway (AP) treated with catheter ablation using thermal ablation in a single center in Denmark.

Methods

This retrospective single-center cohort study included 500 patients with AP who underwent catheter ablation with thermal energy at Rigshospitalet, Copenhagen from 2019-2024 (565 procedures). Data was collected from electronic patient records until 1st of October 2024, and in a subset until May 2025. Median follow-up time was 191 days.

Results

Most patients were males (290, (58%)), and at the time of first ablation the mean age was 26 years; 217 patients (43%) were below 18 years. Acute procedural success was achieved in 464 patients (92.8%), of whom recurrence occurred in 49 patients (10.7%) during follow-up. Septal AP was associated with lower acute success (OR=0.22, p=0.003) compared to non-septal AP. Predictors for later recurrence was septal AP (14%, OR=3.21, p=0.005), right non-septal AP (27.8%, OR=9.5, p<0.00001), and multiple APs (33.3%, OR=7.6, p=0.002), compared to left non-septal AP (4.9%). Woman had significantly lower odds of recurrence compared to men (OR=0.36, p=0.008).

One patient developed complete atrio-ventricular-block (AV-block) and two cases of cardiac tamponade were seen.

Conclusion

Catheter ablation of AP using thermal energy remains a highly effective and safe treatment for both pediatric and adult patients. However, despite improved technology, septal and right-sided pathways remain predictors for later recurrence.

1. Introduction

Ventricular pre-excitation of the heart and the presence of an accessory atrio-ventricular pathway (AP) may lead to tachyarrhythmias including supra-ventricular tachycardia (SVT) or rarely ventricular fibrillation (VF) and sudden cardiac death (SCD). Presence of an AP can cause symptomatic Wolff-Parkinson-White (WPW) syndrome or be an asymptomatic condition [1]. The prevalence of WPW syndrome is 0.1%-0.3% [1–6] and is generally more common among children, men [5] and in some types of congenital heart diseases. [1]

Although the treatment of AP and WPW syndrome includes antiarrhythmic pharmacological treatment, the cornerstone of treatment is invasive treatment with catheter ablation [1, 7, 8, 9]. Radiofrequency ablation (RFA) was introduced in the 1990s as a curative treatment for children with WPW syndrome and later different modalities have been introduced, first focal cryo ablation and recently pulsed field ablation (PFA). [1, 7, 8, 9, 10]

For the last decades, the location of the AP has influenced both accessibility and ablation strategy as well as acute and long-term success rate of catheter ablation. In previous studies, septal and right sided AP have been reported to have higher risk of recurrence, mainly due to the anatomical factors, such as proximity to the normal conduction system and differences in catheter stability, contact and insufficient durability of lesion formation [7, 8, 11]. However, whether recent improvements in technology, such as catheter contact force sensing, higher power settings and more advanced three-dimensional electro-anatomical mapping systems have improved, safety and outcomes of catheter ablation of AP are not known. In addition, pulsed field ablation of patients with AP has become widely used as an alternative to radiofrequency ablation,

The aim of this study is to describe updated trends in patient characteristics, procedural efficacy and safety in an unselected group of all patients with AP treated with thermal ablation from 2019–2024 in our institution.

2. Methods

This single-center cohort study includes 500 patients with an AP, who underwent 565 catheter ablations at Rigshospitalet, Copenhagen between 2019 (2019-01-08) and 2024 (2024-09-24). The patients included in this study originated from different regions in Denmark, Greenland, The Faroe Islands and Sweden. The data were collected retrospectively from hospital records until 1st of October 2024, and in a subset until May 2025. Baseline characteristics, procedural details and follow-up data were categorized accordingly. Acute success was defined as complete elimination of AP conduction during the procedure, meanwhile recurrence during follow-up was defined as documented recurrence (delta-wave or SVT) or re-ablation showing recurrence of AP. All pediatric patients were followed up < 3 months after ablation with ECG and clinical control for symptoms. In adults, patients with preexcitation on ECG before ablation had a new ECG taken 1–3 months after ablation. Median follow-up time was 191.5 days.

During the procedure a standard intracardiac catheter set-up consisted of a 5Fr quadripolar diagnostic catheter positioned in the right ventricle and a 6F 8 polar catheter in coronary sinus, and a mapping/ablation catheter based on the operator’s preferences. Standard EP-study was performed to established AP conduction properties. All procedures were guided by a three-dimensional electro-anatomic mapping system using either CARTO (Biosense Webster) or Ensite (Abbott). In general, a waiting time of 20 minutes after elimination of AP conduction was performed and adenosine injection was done based on the operator’s preferences.

AP locations were categorized into four groups: left non-septal (LNS), right non-septal (RNS), septal and multiple APs. LNS AP included left anterior lateral (LAL) AP, left lateral (LL) AP, left posterior (LP) AP and left posterior lateral (LPL) AP, whereas RNS APs comprised right anterior (RA) AP, right anterior lateral (RAL) AP, right lateral (RL) AP, right posterior (RP) AP, right posterior lateral (RPL) AP and right posterior lateral Mahaim pathway (RPL-MA). Septal APs included left anterior septal (LAS) AP, left posterior septal (LPS) AP, left septal (LS) AP, right anterior septal (RAS) AP, right posterior septal (RPS) AP, right septal (RS) AP, midle-cardiac vein (MCV) AP, septal AP, mid-septal (MS) AP and Para-Hisian (PAH) AP. A detailed distribution of AP locations is provided in table 2.

Our data are expressed as means and SD and univariate and multivariate logistic regression were performed using R-studio. Two separate analyses were performed, one evaluating predictors for acute success including the entire cohort (n = 500), and one evaluating predictors for recurrence during follow-up among the patients who achieved acute procedural success. A p-value < 0.05 was defined as statistically significant.

3. Results

3.1 Patient and procedural characteristics

Our data included 500 patients with the presence of an AP, patient- and procedural characteristics are shown in table 1 and table 2 respectively. The cohort included 290 (58%) men and 210 (42%) women, involving both pediatric and adult patients. Twenty-three (4.6%) were below 10 years at the time of first catheter ablation, 191 (38.2%) were 10–17 years old and 286 (57.2%) were 18 years and above.

Most of the patients had structural normal heart (464 (92.8%)), whereas 29 (5.8%) had structural heart disease and 7 (1.4%) had congenital heart disease. This included Ebstein’s anomaly, coarctation of the aorta, bicuspid aortic valve, pulmonary stenosis, persistent foramen ovale (closed with a device) and one patient with combined Ebstein’s anomaly, coarctation of the aorta and pulmonary stenosis.

Table 1: Patient characteristics	
Variable	
n	500
AGE mean, years	26.8
AGE categories, n (%)	
< 10 years	23 (4.6)
10–17 years	191 (38.2)
≥ 18 years	286 (57.2)
Male sex, n (%)	290 (58.0)
Medical treatment before ablation, n (%)	154 (30.8)
Comorbidities categories, n (%)	
Normal heart structure	456 (91.2)
Congenital heart disease	7 (1.4)
Structural heart disease	28 (5.6)
Unkown/missing	9 (1.8)
Delta-wave on 12-ECG, n (%)	305 (61.0)

At baseline, 154 (30.8%) were medically treated for their arrhythmia and 305 (61%) had documented delta-wave on 12-lead ECG at baseline, of whom 50 (6,1%) were asymptomatic.

Electrophysiological investigation revealed 271 (54.2%) had a LNS AP, 177 (35.4%) had a septal AP, 36 (7.2%) a RNS AP and the remaining 16 (3.2%) had multiple APs. The patients' specific AP locations and their frequency are illustrated in Fig. 2.

RFA was the main energy source used in this cohort, accounting 470 (94%) of all the procedures, meanwhile focal cryo ablation was applied in 12 (2.4%) of the procedures. The two modalities were combined in six cases (1.2%), and PFA was not used in this cohort. Twelve (2.4%) of the patients did not undergo ablation during the procedure (nine due to proximity the conduction system, one clinically slow AP conduction and two due to disappearance of the AP during the procedure).

The applied RFA power varied between 20W and 60W, with most applications performed between 35W-50W. Ablation energy delivery time exceeding 180 seconds was used in almost half the procedures (248 (49.6%)), while shorter ablation time was less frequently. Procedure characteristics are shown in table 2.

Table 2: Procedure characteristics	
Variable	
n	500
Local anesthesia, n (%)	309 (61.8)
Periprocedural ablation modality, n (%)	
Radiofrequency ablation	466 (93.2)
Focal cryo-ablation	12 (2.4)
Multiple modalities	7 (1.4)
Unknown/missing	15 (3.0)
Location of AP, n (%)	
Left non-septal AP	271 (54.2)
LAL	10 (2)
LL	169 (33.8)
LP	29 (5.8)
LPL	63 (12.6)
Right non-septal AP	36 (7.2)
RA	3 (0.6)
RAL	3 (0.6)
RL	10 (2)
RP	6 (1.2)
RPL	8 (1.6)
RPL-MA	6 (1.2)
Septal AP	177 (35.4)
LAS	1 (0.2)
LPS	37 (7.4)
LS	1 (0.2)
RAS	6 (1.2)
RPS	73 (14.6)
RS	11 (2.2)

Table 2: Procedure characteristics	
MCV	6 (1.2)
MS	18 (3.6)
PAH	22 (4.4)
Septal	2 (0.4)
Multiple APs	16 (3.2)
Number of ablation applications, n (%)	
1	77 (15.4)
2	94 (18.8)
3	78 (15.6)
4	50 (10.0)
5	40 (8.0)
≥ 6	146 (29.2)
Unknown/missing	15 (3.0)
Ablation time (seconds), n (%)	
< 60	20 (4.0)
60–90	41 (8.2)
90–119	33 (6.6)
120–149	80 (16.0)
150–180	61 (12.2)
> 180	248 (49.6)
Unkown/missing	17 (3.4)
Power radiofrequency ablation (Watt), n (%)	
< 20	3 (0.6)
20	4 (0.8)
25	6 (1.2)
30	47 (9.4)
35	110 (22.0)
40	115 (23.0)

Table 2: Procedure characteristics	
45	20 (4.0)
50	126 (25.2)
60	33 (6.6)
> 60	1 (0.2)
Unkown/missing	35 (7.0)

Abbreviations

AP, accessory pathway; LAL, left anterior lateral; LL, left lateral; LP: left posterior; LPL, left posterior lateral; RA, right anterior; RAL, right anterior lateral; RL, right lateral; RP, right posterior; RPL, right posterior lateral; RPL-MA, right posterior lateral Mahaim pathway; LAS, left anterior septal; LPS, left posterior septal; LS, left septal; RAS, right anterior septal; RPS, right posterior septal; RS, right septal; MCV, mid-cardiac vein; MS, mid-septal; PAH, Para-Hiss.

3.2 Procedural outcome and safety

Acute procedural success was achieved in 464 (92.8%) patients, meanwhile 36 (7.2%) patients did not achieve acute success. The reasons for no acute success are shown in Fig. 3. Ablation was not completed in 14 patients due to proximity between the AP and the conduction system, and 15 patients had persistent AP conduction despite ablation. Ablation was terminated in four patients (two due to procedure-induced atrial fibrillation, one due to patient anxiety during the procedure and one due to development of myocardial edema). In addition, in two patients the AP conduction disappeared following mechanical manipulation during catheter mapping, and one patient had a clinically non-significant slow AP conduction.

Predictors for acute procedural success were analyzed with univariate and multivariate logistic regression (see supplementary appendix S1). The multivariate analysis showed that septal AP was associated with lower odds of acute procedural success compared to non-septal AP (OR = 0.15, 95% CI: 0.08 to 0.61, p = 0.003). In addition, ablation energy delivery time between 120–180 seconds were associated with higher rate of acute success compared to ablations up to 119 seconds (OR = 10.71, 95% CI: 1.18 to 97.53, p = 0.035). However, ablation energy delivery exceeding 180 seconds was not associated with higher acute success rate compared to ablations until 119 seconds (OR = 0.96, 95% CI: 0.32–2.89, p = 0.94).

Several factors did not show significant influence on acute success, such as, age, sex, delta-wave on baseline ECG, type of anesthesia (general or local anesthesia) and procedural ablation power in watt (see supplementary appendix S1).

In total the patients underwent 565 catheter ablation procedures, and three complications were seen.

One patient developed complete atrio-ventricular-block (AV-block) during ablation of a PS AP. This occurred in a 52-year-old male following RFA at 50W exceeding 180 seconds and afterwards required pacemaker implantation.

Two cases of cardiac tamponade were seen, one in a 38-year-old male with a RPS AP ablated in light sedation using remote magnetic navigation (RMN) and 50W for 3 minutes. There were no signs of complications during the procedure. Two hours after successful ablation, the patient had a drop of blood pressure to 66/50 mmHg in the ward and 450 ml of blood was drained without further complications. This patient was discharged after 2 days. The other patient with tamponade was a 40-year-old male with a LL AP, only conducting retrograde. During ablation in the left lateral part of the left atrium, 47 min after transseptal puncture, using a 7 F MarinR (Medtronic) non-irrigated ablation catheter supported by an Agilis sheath (Abbott), the patient developed tamponade and cardiac arrest. The pericardium was drained and return of spontaneous circulation (ROSC) seen after 7 minutes. After this the patient was stable and transferred to the intensive care unit (ICU) with persistent retrograde AP conduction. The pericardial drain produced 450 ml. and was removed after 5 hours. The patients were discharged after 4 days without further complications and were treated successfully with verapamil and not re-ablated due to patient preferences.

3.3 Recurrence rate during follow-up

During follow-up, 49 (10.7%) of the 464 patients with acute success experienced recurrence of AP. Univariate and multivariate regression was done on several factors to analyze predictors for recurrence, and the results are listed in supplementary appendix S2. In the multivariate model, woman had significantly lower odds of recurrence compared to men (OR = 0.36, 95% CI: 0.16 to 0.74, p = 0.008). Furthermore, AP location showed a significant association with recurrence during follow-up, septal AP (14% vs 4.9%) showed approximately three times higher risk of recurrence compared to LNS AP (OR = 3.21, 95% CI: 1.44 to 7.37, p = 0.0048). Furthermore, RNS AP (27.8% vs 4.9%) showed an even stronger association with recurrence compared to LNS AP (OR = 9.5, 95% CI: 3.5 to 25.91, p < 0.00001). Multiple APs (33.3% vs 4.9%) also showed a higher risk of recurrence compared to LNS AP (OR = 7.59, 95% CI: 1.95–27.81, p = 0.002).

Conversely, age, delta-wave on 12-lead ECG at baseline, type of anesthesia during the procedure, procedural ablation power (watt) and ablation energy delivery time (seconds) were not associated with risk of recurrence (see supplementary appendix 2).

3.4 Pediatric and adult subgroup analysis of AP location and outcome

The overall distribution of AP locations in pediatric (< 18 years) and adult patients were similar. Among the pediatric group (214 (42.8%)), LNS AP was most prevalent (121 (56%)), followed by septal AP (66, (31%)), RNS AP (19 (9%)) and multiple APs (8, (4%)). This pattern was also seen in the adult group (286

(57.2%)) including most frequently LNS AP (150 (52%)), following septal AP (111, (39%)), RNS AP (17 (6%)) and multiple APs (8 (3%)).

In the pediatric group, septal AP was significantly associated with lower acute success compared to LNS AP (OR = 0.06, 95% CI: 0.01 to 0.23, p = 0.0003). The same pattern was seen in the adult subgroup showing septal AP associated with lower acute success compared to LNS AP (OR 0.03, 95% CI: 1.1 to 0.8, p = 0.02). Meanwhile, RNS AP and multiple APs were not significantly associated with acute success in both subgroups (pediatric and adult patients) when compared to LNS AP.

In the pediatric subgroup AP was also a predictor for recurrence during follow-up, since septal AP compared to LNS AP was associated with higher risk of recurrence (OR = 4.47, 95% CI: 1.29 to 17.77, p = 0.021). Likewise, RNS AP was associated with higher risk of recurrence compared to LNS AP (OR = 10.27, 95% CI: 2.45 to 46.00, p = 0.001), and accordingly the presence of multiple APs compared to LNS AP was also significantly associated with higher risk of recurrence among the pediatric subgroup (OR = 21.56, 95% CI: 3.38 to 138.41, p = 0.0008).

Accordingly, in the adult subgroup septal AP and RNS AP showed a higher risk of recurrence during follow-up when compared to LNS AP (Septal AP: OR = 2.5, 95% CI: 1.05 to 6.24, p = 0.04). (RNS AP: OR = 6.25, 95% CI: 1.7 to 21.4, p = 0.004). The same trend was seen in adults with multiple APs when compared to LNS AP, but this association did not reach statistical significance (OR = 5.0, 95% CI: 0.7 to 25.7, p = 0.07), possibly due to small subgroup size (3%).

4. Discussion

4.1 Effectivity and safety of catheter ablation of accessory pathways

This study investigated thermal ablation for AP and/or WPW syndrome in 500 patients between 2019 and 2024 in a single Danish EP-center. We found the treatment highly effective in both pediatric and adult patients with an acute success rate of 92.8% and low recurrence rate of 10.7% during follow-up. The catheter ablations in the present study were mostly performed using RFA, while focal cryo ablation was used in a minor subset of the patients and PFA was not used. These results may serve as an updated reference for comparisons with newer technologies, such as PFA.

This study also found that catheter ablation is very safe in both pediatric and adult patients with an overall complication rate of 0.5%, which is lower than earlier reports. However, these complications are well known risks for catheter ablation. Our data

is consistent with previously published data. [1–9]

4.2 Variables affecting procedural success and recurrence

Our analysis shows that the well-known variables still have influence on the effectiveness of catheter ablation of AP. Some AP locations had a significant association with worse outcomes, meanwhile others had better outcomes. Our findings show catheter ablation of septal AP was associated with lower acute success. LNS AP had a significantly better outcome on both acute and chronic success (recurrence-free). These patients underwent a successful catheter ablation and remained recurrence-free, which suggests that catheter ablation of left sided non-septal AP is still the most effective compared to the other locations and presence of multiple APs.

A subgroup analysis demonstrated that the location of AP was consistent across age groups in the study population. Moreover, the impact of AP location on both acute and long-term success showed similar trends in pediatric and adult subgroups. Specifically, LNS AP were associated with the most favorable outcomes, demonstrating high rates of both acute and chronic success. In contrast, septal and RNS AP locations were the most challenging to eliminate, regardless of patient age.

A study from 2020 including 178 patients treated with RFA for WPW syndrome found both a high ablation success rate (97%) and low recurrence rate (1%) for patients with LL AP located. Conversely, finding a higher recurrence-rate for patients with AP located in the right-free wall (16%), especially when compared to the recurrence-rate for patients with LL AP (1%). [12] This correlates with our finding that RNS AP was significantly associated with recurrence compared to LNS AP, however our analysis also found correlation between recurrence and septal AP and multiple APs.

A multi-center study from 1999 supports our findings that acute success was frequently achieved when ablating LNS AP compared to RNS AP, septal AP and multiple APs. Furthermore, this study also found that recurrence was associated with RNS AP, septal AP and multiple APs. [7] These studies compared to our findings invite further investigation on why some AP locations may compromise the effect of catheter ablation and may result in recurrence. It is important to consider factors that interfere with ablation, such as proximity to the normal conduction system, thicker atrial wall in the right side of the heart and the septum, complexity/direction of the muscle fiber structure and catheter stability during the procedure. When ablating AP is located on the right side the catheter enters the heart through vena cava and is guided to the location of AP where ablation finds place. The anatomical location of RNS APs may be difficult to reach from the catheter’s entrance site. [8]

A study from 1991 describes that RNS AP and septal AP resulted in significantly higher recurrence due to lack of catheter stability [11]. Our data indicates that catheter stability and other characteristics of the right atrium are still associated with less effectiveness of ablation, despite the introduction of more advanced catheters with new features such as contact force sensors. Our data did not support that general anesthesia improves the effect of catheter ablation indicating that catheter stability may not be reduced when the procedure is performed in local anesthesia. However, further studies are important to

understand whether recurrence of these AP locations is due to catheter instability and if different approaches with steerable ablation catheters may serve better outcomes.

RFA was the primary ablation modality used in this study (93.2%) and PFA was not used in the ablation of the patients in this cohort, which primarily is due to the time period of procedures included in this cohort (2019–2024). PFA has been shown to be effective for ablation of AP in smaller studies with short follow-up [10]. In theory, PFA may be more effective either alone or in combination with RFA, but on the other hand irreversible electroporation close to the AP location, makes procedural endpoints challenging. In a first-in-human pilot study from 2024 30 patients with AVNRT undergoing PFA were investigated and results showed that none had AV-block during follow-up after 6 months. [76]. PFAs should be further evaluated in patients with WPW syndrome, especially in patients with septal and right sided non-septal AP.

Our data showed that septal AP was associated with less acute success and lack of ablation due to its proximity to the normal AV-conduction system, thus posing a risk of AV-block. The anatomy of septal APs is considered complex especially the postero-septal part that is in the so-called crux, which is defined as the area between the inferior wall of the right atrium and the posterosuperior process of the left ventricle, and therefore allowing right, left and epicardial connections. In addition, the septal APs run near the AV-conduction, and the atrial part of APs is thicker while the ventricular part consists of thin branches, which may require precise mapping before ablation. [13]

Three-dimensional electro-anatomic mapping was used in all cases and may benefit procedure outcomes. This was investigated in a study from 2020 that found three-dimensional electro-anatomic mapping was 100% effective in identifying AP and RFA was conducted, although this study included patients with AP located to septum and the study included only 23 patients. [14]

Lastly, our study also found that men had a higher risk of recurrence compared to woman,

whereas other factors such as age, and type of anesthesia (general or local) were not associated with either acute ablation failure or recurrence. These factors indicate that catheter ablation is effective in both pediatric and adult patients and can be performed under local anesthesia without compromising the procedural outcome.

Although previous data did not find a correlation between sex and recurrence, the biological differences between male and female hearts, where male hearts generally are bigger with a thicker ventricular wall compared to female hearts [15, 17], may compromise the catheter ablation lesion in the male heart. Moreover, a single-center study included 178 patients found that significantly more woman achieved acute success compared to men when treated with catheter ablation for WPW syndrome. [12] The observed association, between sex and effectivity of catheter ablation should be further investigated in larger, multi-center studies.

4.3 Limitations

This study contains some limitations that may interfere with our findings. Including the retrospective design that depends on collection of data from electronic patient records, that originally was not designed for research purposes and may thus miss information. This involves procedural data that was not consistently documented leading to missing procedural data, some patients did not attend their follow-up appointment, consequently unavailable data on the long-term effect. Although, we tried to compensate by re-checking these patients' electronic records in May 2025, this might contribute to underdiagnosis of recurrence. These factors should be taken in consideration when interpreting our findings. Furthermore, time to loss of accessory pathway conduction during the procedure was not recorded, this may have been a clinical useful parameter to predict recurrence.

5. Conclusion

This study found that thermal catheter ablation for the treatment of AP and WPW syndrome is effective for both pediatric and adult patients with a low complication rate and thus a safe treatment option. Furthermore, we found that catheter ablation efficacy is still influenced by the anatomical location of AP and lower rates of acute success and higher risk of recurrence during follow-up was seen in patients with septal, RNS and multiple APs. To further improve acute ablation success and lower recurrence rates, our findings invite further investigations of the underlying mechanisms behind these findings, specifically catheter stability, cardiac anatomy and technical limitations in cases of difficult AP locations. In addition, the specific advantage of newer ablation modalities, such as PFA should be investigated.

Abbreviations

AP, accessory pathway; LAL, left anterior lateral; LL, left lateral; LP: left posterior; LPL, left posterior lateral; RA, right anterior; RAL, right anterior lateral; RL, right lateral; RP, right posterior; RPL, right posterior lateral; RPL-MA, right posterior lateral Mahaim pathway; LAS, left anterior septal; LPS, left posterior septal; LS, left septal; RAS, right anterior septal; RPS, right posterior septal; RS, right septal; MCV, mid-cardiac vein; MS, mid-septal; PAH, Para-Hiss.

Declarations

Conflict of interest statement:

None

Ethics approval and consent to participate

The study was approved by the institutional review board (IRB) for Rigshospitalet and The Capital Region of Denmark and were performed in accordance with guidelines and the Declaration of Helsinki.

Consent for publication

Not Applicable

Conflict of interest

None.

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None

Author Contribution

XC, CJ, SP,NCFS and PKJ performed the ablations.TA and PKJ came up with the idea and hypothesis, collected the data and performed data analysisTA and PKJ wrote the main manuscript text and TA prepared figures, graphical abstract and tablesAll authors reviewed the manuscript."

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Data Availability

The data for this study are from the electronic health records and restricted access applies according to GDPR

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Figures

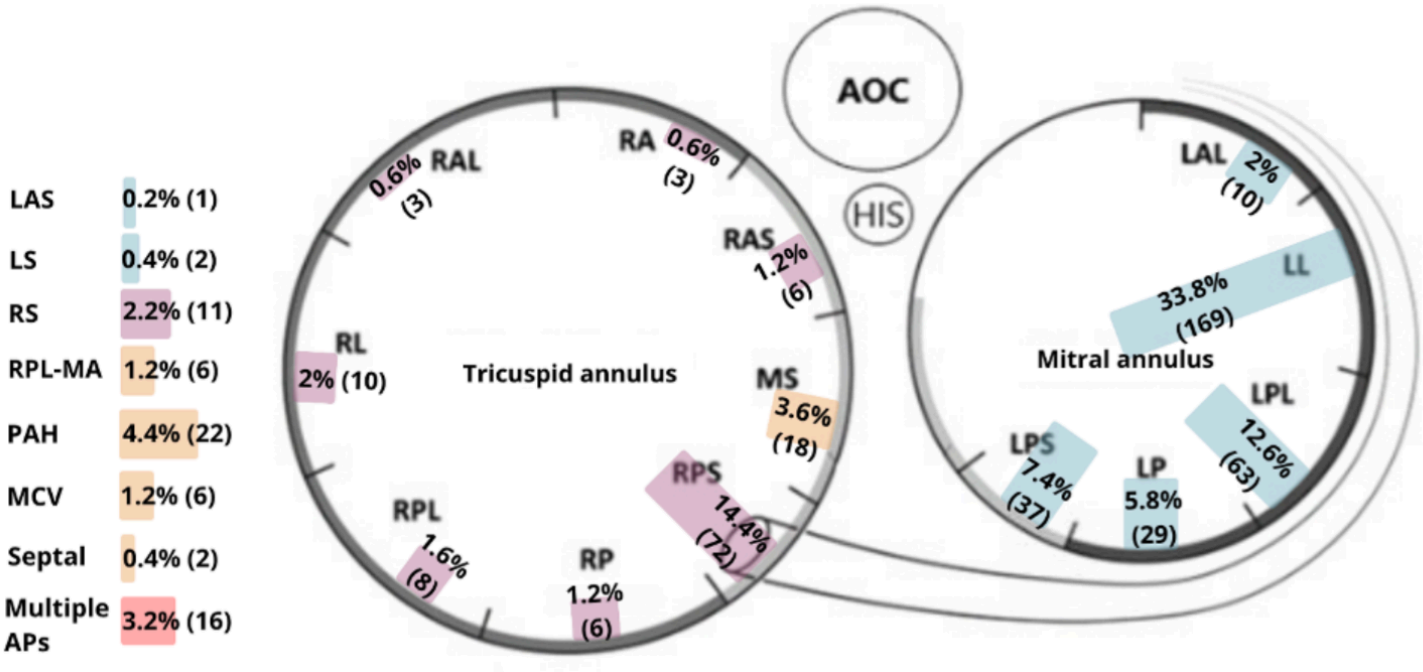


Figure 1

Accessory pathway (AP) localization among the patients included in this study

Abbreviations

HIS, Bundle of His; AOC, aortic cusp; LAL, left anterior lateral; LL, left lateral; LPL, left posterior lateral; LP: left posterior; LPS, left posterior septal; LAS, left anterior septal; LS, left septal; RAL, right anterior lateral; RL, right lateral; RP, right posterior; RPL, right posterior lateral; RPL-MA, right posterior lateral Mahaim pathway; RA, right anterior; RAS, right anterior septal; RPS, right posterior septal; RS, right septal; MCV, mid-cardiac vein; MS, mid-septal; PAH, Para-Hisian.

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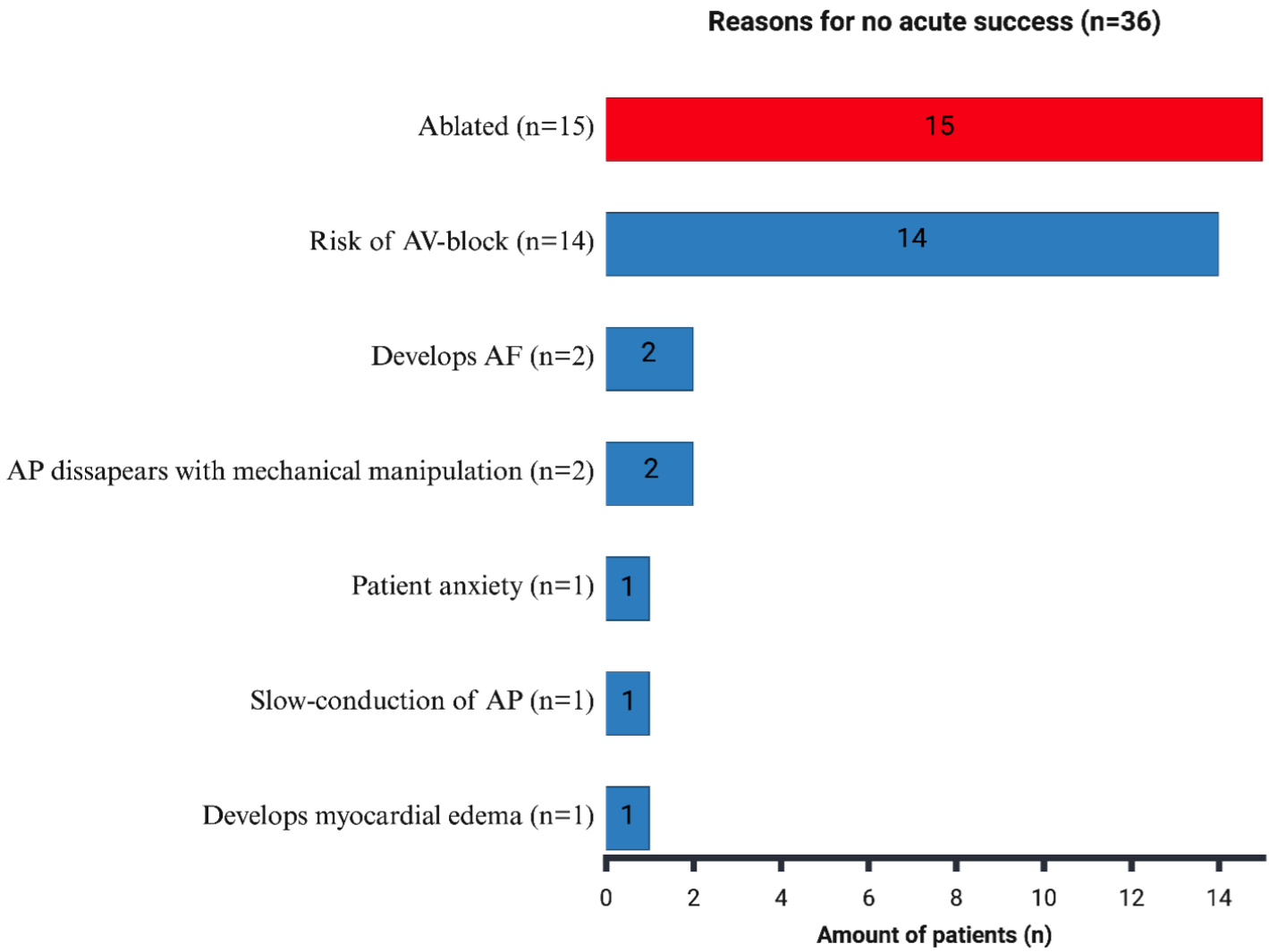


Figure 2

Reasons for no acute success during catheter ablation.

Abbreviations

AV, atrio-ventricular; AF, atrial fibrillation; AP, accessory pathway.

Supplementary Files

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- floatimage1.jpeg