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AV Nodal Reentrant Tachycardia in Patients with Twin AV Nodes

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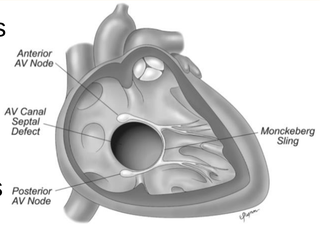
Background

- Twin AV nodes have been demonstrated in complex CHD
- These patients are at risk of SVT supported by a macroreentrant circuit
- AV node reentrant tachycardia (AVNRT) involving an individual AV node in patients with twin AV nodes has not been reported previously



Methods

	Patient #1	Patient #2	Patient #3
Age (years)	3	8	18
Weight (kg)	14	18	53
CHD Diagnosis	Right atrial isomerism, {I,D,D} CAVC, DORV, s/p bilateral, bidirectional Glenn	Right atrial isomerism, {I,D,D} CAVC, DORV, s/p bidirectional Glenn	Dextrocardia, right atrial isomerism, {I,L,L} CAVC, DORV, s/p extracardiac Fontan
Indication for EP Study	Anatomy, pre-Fontan cath	Palpitations, anatomy, pre-Fontan cath	Documented SVT
Previous Study?	No	No	Yes

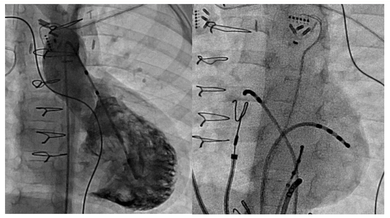
Findings

	Patient #1	Patient #2	Patient #3
QRS Morphologies	2	1	2
His Potentials	Superior and inferior AVN	Superior and inferior AVN	Inferior AVN
Adenosine Effect	VA block	VA block	VA block
Tachycardia CL VA Interval	318 ms 146 ms	312 ms 132 ms	405 ms 144 ms
PPI-TCL	56 ms	50 ms	36 ms
PVC Advanced A	Yes	Yes	Yes
Ablation	Cryo and RF at inferior AVN	RF at superior, cryo at inferior AVN	RF at superior AVN

Findings Supporting Macroreentrant Twin AV Nodal Tachycardia

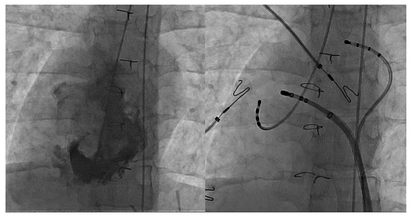
	Patient #1	Patient #2	Patient #3
SSPC	Borderline	Yes	Yes
AH Jump	Borderline	Yes	Yes
Typical AVN Echos	No	Yes	Yes
Slow-Fast AVNRT CL VA	Yes 410 ms -22 ms	Yes 268 ms -18 ms	Yes 286 ms 26 ms
Slow-Slow AVNRT CL VA	No	Yes 272 ms 100 ms	No
PPI-TCL	N/A	155 ms	N/A
Ablation	Cryo at inferior AVN	Cryo at inferior AVN	RF at superior AVN

Findings Supporting AVNRT of Individual AV Nodes



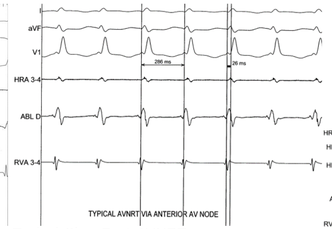
Ablation of AVNRT at Inferior AVN in Patient #1: All catheters antegrade via IVC

Ablation of AVNRT at Superior AVN in Patient #3: Transconduit access with ablation catheter, atrial pacing catheter at PA-SVC junction, RV pacing retrograde via aorta

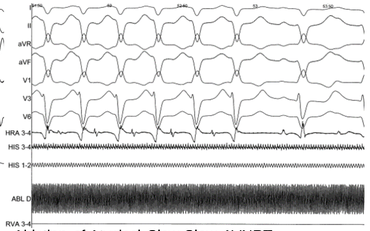


Change in QRS with decremental pacing

Entrainment of TAVNT, VAV Response and PPI-TCL 36 ms



Typical Slow-Fast AVNRT



Ablation of Atypical Slow-Slow AVNRT

	Patient #1	Patient #2	Patient #3
Access	IVC	IVC	Transconduit and retrograde
EAM (NavX, St Jude)	Yes	Yes	Yes
Duration	3 hrs	5.5 hrs	5 hrs
Fluoro Time	6.4 min	3 min	5.9 min
Complications	None	None	1st degree AVB
Follow-up	No recurrence in 10 months	No recurrence in 10 months	No recurrence in 34 months

Conclusions

- Twin AV nodes may be present in complex CHD, especially patients with heterotaxy
- Clinicians should be aware of the possibility of multiple mechanisms of SVT in these patients
- Patients with atrial isomerism should be carefully evaluated for twin AV nodes and considered for an EP study at the time of pre-Fontan catheterization

References

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3.Epstein, MR. AVRT Involving AV Nodes in Patients with Complex Congenital Heart Disease. *J Cardiovasc Electrophysiol.* 2001.

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