Paroxysmal Regular Supraventricular Tachycardia: The Diagnostic Accuracy of the Transesophageal Ventriculo-Atrial Interval

Frieder Braunschweig, M.D., Ph.D., F.E.S.C.,* Petra Christel, M.D.,*
Mats Jensen-Urstad, M.D., Ph.D.,* Mats Andersson, R.N.,*
Jonas Schwieler, M.D., Ph.D.,* Jari Tapanainen, M.D., Ph.D.,*
Hamid Bastani, M.D.,* Fredrik Gadler, M.D., Ph.D.,*
Cecilia Linde, M.D., Ph.D., F.E.S.C.,* Wolfgang Schöls, M.D., Ph.D.,†
and Lennart Bergfeldt, M.D., Ph.D., F.E.S.C.‡

From the *Electrophysiology & Arrhythmia Service, Department of Cardiology, Karolinska University Hospital, Karolinska Institutet, Stockholm, Sweden; †Department of Cardiology, Duisburg Heart Center, Kaiser-Wilhelm-Hospital, Duisburg, Germany; and ‡Department of Molecular and Clinical Medicine/Cardiology, University of Gothenburg, Gothenburg, Sweden

Objective: To establish the diagnostic accuracy of the transesophageal ventriculo-atrial (VA) interval in patients with paroxysmal supraventricular tachycardia (PSVT) and normal baseline electrocardiogram (ECG).

Methods: The transesophageal VA interval during tachycardia was recorded in 318 patients (age 45 ± 17 years, 58% female) with PSVT and a normal surface ECG between attacks. Subsequently, all patients underwent an ablation procedure establishing the correct tachycardia diagnosis.

Results: AV nodal reentrant tachycardia (AVNRT), AV reentrant tachycardia through a concealed accessory pathway (AVRT), and ectopic atrial tachycardia (EAT) were found in 213, 95, and 10 cases, respectively. Receiver operating characteristic curve analysis identified an optimal cutoff for a binary categorization of AVNRT versus AVRT/EAT at ≤ 80 ms (area under the curve 0.891). Owing to a biphasic distribution, AVNRT was very likely at VA intervals ≤ 90 ms with a sensitivity, specificity, and positive predictive value (PPV) of 87%, 91%, and 95%. In the range 91–160 ms the corresponding values for AVRT were 88%, 95%, and 88% (90%, 99%, and 98% in male patients). In the small group with VA intervals >160 ms ($n = 29$), the diagnosis was less clear (PPV of 67% for AVNRT).

Conclusions: In patients with sudden onset regular tachycardia and a normal ECG during sinus rhythm, a transesophageal VA interval of ≤ 80 ms has the highest diagnostic accuracy to diagnose AVNRT versus AVRT/EAT. Overall, the biphasic distribution of VA intervals suggests considering AVNRT at 90 ms and below and AVRT between 91 and 160 ms (in particular in male patients) while the diagnosis is vague at VA intervals above 160 ms.

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atrioventricular nodal reentry/physiopathology tachycardia; Wolff-Parkinson-White syndrome/physiopathology; supraventricular/*diagnosis/etiology tachycardia; sensitivity and specificity; male; female

Sudden onset and regular palpitations is a frequent reason for emergency care visits. When they occur as a transitory event in otherwise healthy and often young individuals the symptoms might be misinterpreted, and both a proper diagnosis and

the specific mechanism might be missed. A sudden onset suggests paroxysmal supraventricular tachycardia (PSVT) as the cause, an arrhythmia with an estimated prevalence of 2.3/1000.¹ The major diagnostic alternatives are AV nodal reentrant

Address for correspondence: Frieder Braunschweig, M.D., Ph.D., F.E.S.C., Department of Cardiology, Karolinska University Hospital, S-171 76 Stockholm, Sweden. Fax: +46-8-31 10 44; E-mail: frieder.braunschweig@karolinska.se

tachycardia (AVNRT) and atrioventricular reentrant tachycardia via an accessory pathway (AVRT), and to a lesser extent ectopic atrial tachycardias (EAT). While the diagnosis is obvious in the presence of delta-waves, the tachycardia mechanism might be difficult to establish in patients with a normal surface electrocardiogram (ECG) during sinus rhythm.

The esophageal ECG is a useful noninvasive tool in the differential diagnosis of arrhythmias. Recorded simultaneously with the surface ECG it facilitates the discrimination of atrial and ventricular potentials and is, therefore, helpful to determine the mechanism of *ongoing* regular tachycardia.² Accordingly, transesophageal ECG recording is well established in the emergency care setting to assist differentiation between supraventricular and ventricular tachycardia. Moreover, in centers without access to invasive electrophysiology, transesophageal atrial stimulation (TAS) may still be used as an alternative to the invasive counterpart for provoking supraventricular arrhythmia and establishing its mechanism.³ A 70 ms ventriculoatrial conduction interval (VA interval) at transesophageal recording has received wide clinical acceptance as a divider between AVNRT of the common (= "typical") type ($VA \leq 70\text{ms}$), and AVRT ($VA > 70\text{ms}$).⁴⁻⁹ However, the diagnostic accuracy of this approach has never been assessed in a large patient cohort, and only few studies have confirmed the "transesophageal diagnosis" by an invasive electrophysiological procedure.^{2,10,11}

The aim of this study was therefore to determine the diagnostic accuracy of the transesophageal VA interval in the differential diagnosis of the arrhythmia mechanism in patients presenting with palpitations, suspected to be due to PSVT, and a nondiagnostic surface ECG during sinus rhythm. The correct arrhythmia diagnosis was established by a subsequent ablation procedure.

METHODS

Patients were included if they had (1) a history of sudden onset rapid and regular palpitations; (2) a normal surface ECG during sinus rhythm, where "normal" means the absence of preexcitation and abnormalities suggestive of a ventricular arrhythmia substrate, but does not exclude minor unspecific abnormalities; (3) a transesophageal recording during tachycardia providing a VA interval; and (4) a subsequent invasive electrophysiological study (EPS), mostly as the initial part of an ablation

procedure, providing the correct tachycardia diagnosis. All procedures were part of the clinical evaluation of the patients, who gave their consent prior to each part. Patients were identified from two databases containing crucial demographic, clinical, and electrophysiological information from all consecutive TAS procedures and EPS at Karolinska University Hospital between June 1990 and December 2007.

The TAS was performed with the patient fasting, nonsedated, and resting on an adjustable bed. A bipolar electrode (model 6992, Medtronic Inc., Minneapolis, MN, USA) was introduced through a nasal orifice, positioned in esophagus to provide the largest atrial signal, and fixated on the cheek. The electrode was connected to a preamplifier (Arczo Medical Electronics, Chicago, IL, USA) and a cardiac stimulator (model 5328, Medtronic Inc., Minneapolis, MN, USA). The TAS included the determination of baseline conduction characteristics including the rate at AV block (Wenckebach cycle length). Arrhythmia induction was attempted by pacing at different basic cycle lengths (usually between 600 and 350 ms) followed by single and double extra-stimuli. Individually titrated isoprenaline infusion and/or intravenous atropine were given, if required.

During tachycardia a 12-lead ECG as well as a composite 6-lead tracing from the esophageal and surface leads was recorded at a paper speed of 100 mm/s and used for the assessment of the VA interval. The shortest VA interval was defined from the earliest deflection of the QRS-complex in any of the six leads to the onset of atrial activity, which was defined according to internal guidelines, i.e., using the transesophageal QRS during sinus rhythm as a template (Fig. 1). VA intervals were rounded off and noted in steps of 10 ms. When a sustained tachycardia had been adequately recorded and the palpitations acknowledged by the patient to be similar to their previous symptoms it was not reinduced. In a subset of 30 patients, the agreement between five observers for the dichotomy ≤ 70 versus > 70 ms was approximately 90%.

After the procedure, patients indicated their overall discomfort caused by TAS on an 11-point visual analogue scale (VAS 0–10). All data, including the VA interval, were collected by the physician in charge at the time of the TAS, who was unaware of the final arrhythmia diagnosis from EPS. None of the patients had previously been subjected to any invasive or noninvasive EPS. The EPS

Figure 1. Transesophageal ventriculo-atrial conduction (VA) intervals in two patients with atrioventricular node reentrant tachycardia (AVNRT; Panel A: tachycardia, Panel B: sinus rhythm) and AV reentrant tachycardia via an accessory pathway (AVRT; Panel C: tachycardia, Panel D: sinus rhythm). Transesophageal signals (lead A 3–4 or A 2–3) are displayed together with leads II and V₁ from the surface ECG. The morphology of transesophageal atrial and ventricular complexes during sinus rhythm was used as a template to enhance identification of the atrial potential onset during tachycardia. The pseudo-r' deflection shown in V₁ during AVNRT (Panel A) coincides with atrial activity but occurs later than the onset of the transesophageal atrial signal. Estimation of the VA interval from the surface ECG would have provided a value of 90 ms and, thus, more uncertainty in the discrimination against AVRT. Despite the long VA interval during AVRT (Panel C), no distinct atrial signal is observed in the surface ECG.

procedures were performed according to international standard routines using conventional equipment, and the PSVT mechanism was defined by established criteria.⁹

Statistical Methods

Data are presented as mean $\pm$ standard deviation, and 95% confidence intervals (95% CI) are provided for proportions either in the text or tables. The sensitivity, specificity, positive and negative predictive values together with 95% CIs were calculated according to standard definitions.¹² Differences between groups were compared with a two-sided unpaired *t*-test or the sign test, where appropriate. A *P*-value < 0.05 was considered statistically significant. Receiver operating characteristic (ROC) curves, a Wilcoxon estimate of

the area under the curve (AUC) and the corresponding 95% CI was calculated using Stats Direct 2.7.7 (StatsDirect Ltd, Altrincham, UK). Other statistical analyses were performed using Statistica (Statsoft, Tulsa, USA).

RESULTS

Altogether, 318 patients fulfilled the inclusion criteria. Patient characteristics are presented in Tables 1 and 2. Six percent had been diagnosed with structural heart disease. EPS was conducted median 3 months (range 0–98) after the TAS and a successful ablation of the arrhythmia substrate was achieved in 312 patients (98%).

When physicians made a preliminary diagnosis from TAS (*n* = 311) based on the conventional 70 ms dichotomy, observations from arrhythmia

Table 1. Clinical Data and Tachycardia Rate at the Transesophageal Study

	All Patients	AVNRT	AVRT	EAT
N	318	213	95***	10
Proportion (%; 95% CI)	-	67 (62–72)	30 (25–35)	3 (1–5)
Age (years)	45 ± 17	49 ± 16	36 ± 16***	53 ± 9
Female (%; 95% CI)	58 (53–64)	67 (60–73)	37 (27–47)	80 (55–100)
Duration of symptoms (years)	16 ± 14	17 ± 15	13 ± 13*	12 ± 13
HR _{max} during tachycardia (bpm)	199 ± 33	196 ± 30	204 ± 37	199 ± 64
Number of AAD tested	1.5 ± 1.1	1.6 ± 1.1	1.2 ± 1.0**	2.2 ± 1.3
History of syncope (%; 95% CI)	19 (14–23)	21 (15–27)	14 (1–21)*	22 (1–49)
History of DC conversion (%; 95% CI)	8 (4–12)	8 (3–12)	6 (0–12)	2
Structural heart disease (%; 95% CI) (%)	6 (3–9)	0	6 (3–9)	0

The diagnoses are based on the ablation procedure. Proportions are presented as percentage with 95% confidence intervals within brackets, otherwise as mean ± SD.

AAD = antiarrhythmic drugs; AVNRT = atrioventricular node reentrant tachycardia; AVRT = orthodromic AV reentrant tachycardia via an accessory pathway; bpm = beats per minute; CI = 95% confidence interval; DC = direct current; EAT = ectopic atrial tachycardia; HR = heart rate; *P < 0.05; **P < 0.01; ***P < 0.001 between AVRT and AVNRT.

Table 2. Clinical Data Collected at the Transesophageal Study, Separated for Female and Male Patients; Diagnosis Based on the Invasive Procedure

	Female All		Male All	
	AVNRT	AVRT	AVNRT	AVRT
n (%; 95% CI)	185 (58; 53–63)		133 (42; 36–47)**	
	142 (77; 71–83)	35 (19; 13–26)	71 (53; 45–62)	60 (45; 378–54)
Age (years)	46 ± 16		43 ± 18	
	48 ± 16	39 ± 14	51 ± 16	35 ± 17
Duration of symptoms (years)	17 ± 14		13 ± 13***	
	19 ± 14	18 ± 15	15 ± 15	11 ± 11
HR _{max} during tachycardia (bpm)	203 ± 33		195 ± 34	
	200 ± 31	212 ± 30	190 ± 28	200 ± 37
Number of AAD tested	1.6 ± 1.1		1.3 ± 1.0*	
	1.7 ± 1.1	1.5 ± 1.2	1.5 ± 1.1	1.2 ± 0.9
History of syncope; [(%; 95% CI)]	25 (19–31)		13 (7–19)**	
	28	7	11	8
History of DC conversion; (%; 95% CI)	6 (3–9)		10 (54–15)*	
	3	9	19	5

Abbreviations as in Table 1. *P < 0.05; **P < 0.01, ***P < 0.001 between female and male gender.

onset, and the patient history, this diagnosis was confirmed by the invasive procedure in 283 cases (91%; 95% CI: 88–94). All misdiagnosed patients had a VA interval ≥ 70 ms (mean 124 ± 53 ms) and were typically misinterpreted as AVRT when AVNRT turned out to be the correct diagnosis (in 18/28 cases).

Transesophageal stimulation caused moderate discomfort with an average of 4.6 ± 2.0 on

the VAS scale and was more prominent among women (4.9 ± 2) compared with men (4.3 ± 1.9 ; $P = 0.01$).

PSVT Diagnosis and Its Relation to the VA Interval

According to the invasive EPS, AVNRT was present in 213 patients (67%), AVRT in 95 (30%),

Figure 2. Frequency distribution of transesophageal ventriculo-atrial conduction (VA) intervals associated with the diagnosis of atrioventricular node reentrant tachycardia (AVNRT), AV reentrant tachycardia via an accessory pathway (AVRT) and ectopic atrial tachycardia (EAT) in 318 patients with paroxysmal supraventricular tachycardia and a normal surface ECG between attacks. The final diagnosis was established during the ablation procedure.

Table 3. Sensitivity, Specificity, Positive Predictive Value, Negative Predictive Value, and Accuracy of Selected Transesophageal VA Intervals for the Diagnosis of AVNRT or AVRT

Diagnostic approach (VA interval)	Sensitivity [% (95% CI)]	Specificity [% (95% CI)]	Positive Predictive Value [% (95% CI)]	Negative Predictive Value [% (95% CI)]
Diagnosing AVNRT (binary approach)				
≤70 ms	79 (73–84)	98 (93–99)	99 (95–100)	70 (62–77)
≤80 ms	84 (78–88)	94 (88–98)	97 (93–99)	74 (66–81)
≤90 ms	87 (81–91)	91 (83–95)	95 (91–97)	77 (69–84)
Diagnosing AVRT (binary approach)				
>70 ms	99 (94–100)	76 (70–81)	64 (56–72)	99 (96–100)
>80 ms	96 (89–99)	81 (75–86)	68 (59–76)	98 (94–99)
>90 ms	92 (84–96)	84 (79–88)	71 (62–78)	96 (98–98)
Diagnosing AVRT				
91–160 ms (all)	88 (80–94)	95 (91–97)	88 (80–94)	95 (91–97)
91–160 ms (men)	90 (79–96)	99 (92–100)	98 (90–100)	92 (83–97)
91–160 ms (women)	86 (69–95)	93 (88–97)	75 (59–87)	97 (92–99)
Diagnosing AVRT				
>160 ms	8 (0–13)	89 (81–94)	59 (39–76)	32 (27–38)

AVNRT = atrioventricular node reentrant tachycardia; AVRT = orthodromic AV reentrant tachycardia via an accessory pathway. 95% CI = 95% confidence interval.

and EAT in 10 cases (3%). In patients with AVNRT, 195 and 18 represented the common (slow-fast) and uncommon (fast-slow or slow-slow) type, respectively. VA intervals in patients with the uncommon-type of AVNRT ranged from 140 to 400 ms (mean 241 ± 75).

Figure 2 shows the biphasic distribution of transesophageal VAs for the three types of SVT. There are two Gaussian components representing the groups of patients with AVNRT and AVRT. The sensitivity, specificity, positive and negative predictive values, and accuracy of selected

Figure 3. Receiver operating characteristic (ROC) curves of the transesophageal ventriculo-atrial-conduction (VA) intervals for the diagnosis of atrioventricular node reentrant tachycardia (AVNRT) and atrioventricular reentrant tachycardia (AVRT) in patients with a nondiagnostic surface ECG between attacks. The mechanism of supraventricular tachycardia was determined by an electrophysiological study. Curves are based on 46 cutoff values (AVNRT $\leq$ VA < AVRT or EAT; AVRT > VA $\geq$ AVNRT or EAT). Numbers indicate selected VA intervals in ms (for further details see Table 3).

VA intervals in determining the correct PSVT diagnosis are presented in Table 3. The conventional cutoff at ≤ 70 ms had a sensitivity for AVNRT versus AVRT/EAT of 79% and was highly specific (98%) with a positive predictive value of 99%. Overall, when the VA interval was used for a binary classification of AVNRT versus AVRT or EAT, ROC curve analysis showed an AUC of 0.891 (Fig. 3). Similarly, the AUC was 0.867 for AVRT versus AVNRT/EAT. A cutoff at 80 ms (AVNRT ≤ 80 ms < AVRT) yielded the best discrimination between these two diagnoses and would identify the correct arrhythmia mechanism in 84% (95% CI 80–88%) of study patients.

Still, among the 194 patients (61%) with a VA interval of ≤ 90 ms there was a high accuracy for diagnosing AVNRT (sensitivity 87%, specificity 91%, PPV 95%). In contrast, VA intervals in the range between 91 ms and 160 ms associated with AVRT in the vast majority of cases. Among the 95 patients (30%) with a VA interval of 91–160 ms, 84 (88%)

had AVRT. Accordingly, a VA interval between 91 and 160 ms had a sensitivity of 88%, a specificity of 95%, and a PPV of 88% to diagnose AVRT (Table 3). In the remaining small group of patients with a long VA intervals above 160 ms ($n = 29$; 9%), the diagnosis was less clear though these VA intervals were most often associated with AVNRT (PPV 59%, 95% CI 39–76%). Following this algorithm (VA interval ≤ 90 : AVNRT, 91–160 ms: AVRT, >160 ms: AVRT) would have identified the correct diagnosis in 90% (95% CI 87–93%) solely based on the VA interval.

Gender Differences

Table 2 and Figure 4 present patient data from a gender perspective. Overall, 58% of patients were female. The ratio of AVNRT/ AVRT was 142/35 (4.1/1) in women, but 71/60 (1.2/1) in men. Among the 10 patients with EAT, eight were female. Accordingly, Figure 4 shows a female preponderance in the group of patients with a VA interval ≤ 90 ms

Figure 4. Gender related association between different types of paroxysmal supraventricular tachycardia and transesophageal VA intervals in 185 female and 133 male patients with sudden onset palpitations and a non-diagnostic surface ECG between attacks. Definite diagnosis was established during the invasive electrophysiological (ablation) procedure. VA intervals ≤ 90 ms highly suggest AVNRT while AVRT is the predominant diagnosis in the range 91–160 ms, in particular in men. The diagnosis is less clear in the small group with VA intervals > 160 ms, though AVNRT is more common. For exact numbers: see text and Table 3. AVNRT = atrioventricular node reentrant tachycardia; AVRT = atrioventricular reentrant tachycardia via an accessory pathway, EAT = ectopic atrial tachycardia.

(67%, 95% CI 60–74%) while men were more common in the range of VA intervals between 91 and 160 ms (58%; 95% CI 48–68%). Notably, at VA intervals between 91 and 160 ms, the likelihood for AVRT in men was 98% while it was 75% in women ($P < 0.01$).

Prior to the TAS, women had a 6-year longer duration of symptoms ($P < 0.01$), had tested more antiarrhythmic drugs ($P < 0.05$), and had experienced more syncope attacks ($P < 0.001$). These gender differences were present both among AVNRT and AVRT patients.

DISCUSSION

The present study, in patients with sudden onset palpitations and a normal surface ECG during sinus rhythm, assessed the diagnostic accuracy of the transesophageal recording procedure (the VA interval) during regular supraventricular tachycardia against a subsequent invasive electrophysiological procedure. AVNRT and AVRT were the dominating diagnoses found in 97% of the cases. An 80-ms cutoff value of the VA interval provided the highest diagnostic accuracy to differentiate between these two diagnoses and is recommendable if a binary classification approach is chosen ($\text{AVNRT} \leq 80 \text{ ms} < \text{WPW or EAT}$).

Our study is in agreement with previous reports^{4–9} showing that VA intervals ≤ 70 ms are almost always associated with a diagnosis of AVNRT (PPV 99%) and accurately exclude AVRT (negative predictive value 99%). However, due to the characteristic distribution of VA intervals shown in Figure 2, the greatest diagnostic yield (90% correct diagnoses) is achieved by attributing a diagnosis of AVNRT in association with VA intervals ≤ 90 ms while AVRT should be suggested in the range of 91–160 ms, in particular among male subjects (PPV 98%). In the small group of patients with VA intervals above 160 ms, the diagnosis is vague, even if AVNRT (predominantly of the uncommon type) should be suspected in first place.

Clinical Implications

Data on the diagnostic accuracy of the transesophageal VA interval provide crucial methodological information for its application in clinical cardiology and emergency medicine. Moreover, in centers with no access to invasive electrophysiology and in patients unwilling to un-

dergo an invasive procedure, transesophageal studies offer an inexpensive and minimal invasive diagnostic tool to properly diagnose PSVT patients (prove the presence of an arrhythmia substrate) with a normal (nondiagnostic) ECG during sinus rhythm. In our experience, the verification of PSVT and its mechanism by a transesophageal study was also valuable for patient management and the discussion of the treatment alternatives in some subjects with palpitations without previously documented arrhythmia.

Importantly, the interpretation of transesophageal ECG recordings is not exclusively based on the interpretation of VA intervals but also takes information such as the patients history, tachycardia-onset, -regularity, and -termination into account. It is conceivable that this will further add to the diagnostic yield, e.g., by identifying tachycardia patterns likely to be associated with EAT or AVNRT of the uncommon type. Physicians in our study, using the conventional 70 ms dichotomy together with pertinent clinical information, made an accurate mechanistic PSVT diagnosis in 91% as compared with the invasive diagnosis, which is consistent with a previous report.¹⁰ The 9% incorrect diagnoses from the transesophageal test occurred mostly in patients with a VA interval ≥ 70 ms. Thus, our results corroborate the original report by Gallagher that the transesophageal VA relation can only be used to *exclude* reentry via an accessory pathway (AVRT), when the VA interval is short (≤ 70 ms), while a larger interval does not prove its existence.⁴ Notably, the findings of this study may contribute to improve the diagnostic accuracy of transesophageal ECG recordings especially in the range of VA intervals above 70 ms.

Careful analysis of the surface ECG recorded during regular tachycardia, possibly aided by adenosine injection or carotid massage, often provides critical hints as to the underlying mechanism of arrhythmia by classifying the RP interval as shorter (pseudo R' in lead V₁) or greater than 70 ms. However, P waves may not be visible or hidden in wide QRS complex tachycardia and an accurate diagnosis based on VA interval analysis from the surface ECG is often difficult (see Fig. 1). Thus, the use of esophageal electrodes during ongoing tachycardia can be helpful to establish the correct diagnosis and can even offer a tool to terminate the arrhythmia by overdrive pacing.

Table 4. Distribution of Paroxysmal Supraventricular Tachycardia Diagnoses between Female and Male Patients

Author	n	Female			Male		
		AVNRT	AVRT	EAT	AVNRT	AVRT	EAT
Rodriguez ¹⁵	306	114	31	26	51	61	23
Liu ¹⁶	548	219	105	Not included	109	115	Not included
Porter ¹⁷	1856 ^a	727	227	195	314	273	120
Braunschweig	318	142	35	8	71	60	2
	3028	1202	398	229	545	509	145
		66% (64–68)	22% (20–24)	13% (11–15)	46% (43–49)	43% (40–46)	12% (10–14)

AVNRT = atrioventricular node reentrant tachycardia; AVRT = orthodromic AV reentrant tachycardia via an accessory pathway; EAT = ectopic atrial tachycardia.

^a1754 patients; 98 (6%) had more than one PSVT substrate.

While our findings emphasize the diagnostic value of ECG registrations from the esophagus, they also confirm an important limitation of electrophysiological studies using electrical transesophageal stimulation: patients, in particular women, experienced moderate discomfort approximating 5 points on the 0–10 point VAS scale, an obstacle which is difficult to overcome by variations of the esophageal pacing technique.¹³ Therefore, in palpitation patients without documented tachycardia but a history typical for PSVT, an invasive electrophysiological investigation with the option for immediate ablation of the arrhythmia substrate is commonly preferred in clinical practice¹⁴ given ample access to electrophysiology lab facilities is provided.

Gender Perspective

For the calculation of the *predictive value* the prevalence of a specific disorder is of crucial importance.¹² Our study confirms that the prevalence of different PSVT mechanisms is gender dependent with a female preponderance for AVNRT, while the opposite is true for WPW, whether overt or concealed.^{15–17} Expressed differently, in a woman with a nondiagnostic surface ECG, AVNRT is almost three times more common than AVRT, while AVNRT and AVRT are equally likely in men (Table 4). Owing to this gender-related distribution, the diagnosis of AVRT at VA interval between 91 and 160 ms is particularly likely in male patients (PPV 98%).

In addition, the present study provides some thought provoking data on gender related differences in the course of PSVT. The duration from the first symptomatic episode to diagnostic evaluation was significantly longer in female patients.

Whether this is due to patient or doctor delay, or a combination, cannot be concluded. Some of our female patients, however, spontaneously reported that their palpitations had been interpreted as anxiety or panic disorders. The clinical reality of such an underestimation of arrhythmia as the cause of palpitations was recently corroborated.¹⁸ Even though our results are in agreement with a previous report on substantial differences in the age of symptom onset between AVNRT and AVRT,¹⁹ the diagnostic delay among female patients was apparent in both arrhythmia groups (Table 2). Clearly, a history of a sudden onset regular tachycardia should alert any physician to the possibility of a curable arrhythmia substrate, and allow differentiation from the more gradual onset of sinus tachycardia, which might accompany, e.g., anxiety and panic disorders.

Limitations

The referral pattern of patients for the transesophageal diagnostic procedure might have biased the pretest likelihood of inducing a specific arrhythmia. The proportion of patients with different PSVT mechanisms was, however, similar to a previous report.⁹ Because of the inclusion criteria and possible referral bias it is not possible to relate the present results to a consecutive series of patients with palpitations visiting an emergency room. Such a population would include patients with palpitations due to other causes including a significant proportion of psychiatric conditions.²⁰

CONCLUSION

A PSVT diagnosis solely based on transesophageal recording of the VA interval during tachycardia in patients with sudden onset

palpitations and a normal ECG during sinus rhythm is accurate in approximately 90% and can assist in the decision making when the patient and/or doctor is hesitant as to the therapeutic alternatives.

VA intervals of 90 ms and below are very likely to be associated with AVNRT, while AVRT is highly suggested by VA intervals in the range of 91–160 ms, in particular in male patients. Using a binary classification, an 80-ms cutoff yields the highest diagnostic accuracy. These findings emphasize the diagnostic value of transesophageal ECG registrations. However, arrhythmia assessment using esophageal stimulation is limited by moderate patient discomfort.

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