

## Immediate Results of Radiofrequency Ablation of Junctional Tachycardia in Elder Patients

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### ABSTRACT

Radiofrequency ablation is considered to be the method of reference for treatment of paroxysmal Junctional Tachycardias (JT), which allows to reduce, or even to abolish badly tolerated or insufficiently efficient medical treatment. Though according few studies, in old patients due to coexistence of other chronic pathologies, it elevates the risk linked to the method of EES or Radio frequency ablation, rather than young once. The target of our study, practiced on 54 patients (26 women and 28 men) of 50 years old and more (medium age  $61 \pm 8.7$  years) was to assess the immediate results of radio frequency ablation of JT and determine complications linked to this procedure in this population. Our study showed obviously good results on preventing JT attacks and low rate of complications linked to the procedures.

**KEYWORDS:** *junctional tachycardia, endocavitary electrophysiological study, radiofrequency ablation*

Junctional Tachycardias, still called "Disease of Bouveret" or reciprocal tachycardias, are comparatively frequent in common medicinal practice, which needs specialized medical care in hospitals. Numerous studies showed that electrophysiological characteristics of WPW Syndrome and the intra-nodal reentry are not dependent on age [1,8,10] and the mechanisms of tachycardia, its rate and other tachycardia induction (Atrial Fibrillation, Flutter) during electrophysiological study are similar in women and men; furthermore, there is practically no difference between old or young patients in this regard [3,9]. But the coexistence of other chronic pathologies in elder patients elevates the risk linked to the method of EES or Radio frequency ablation, rather than young once.

To palliate this deficient information in this field and to try to bring some elements of answer, we accomplished a retrospective study in all the patients at 50 and more, to which radio frequency ablation of Junctional Tachycardia (due to intranodal reentry or accessory pathway) has been practiced during last 5 years (1998 to 2003).

### MATERIAL AND METHODS

The 54 patients at the age of 50 and more were studied: 26 women and 28 men (medium age  $61 \pm 8.7$  years), to whom radio frequency ablation of junctional tachycardia were performed in the hospital Saint - Marguerite in Marseilles, France, during last 5 years (1998-2003). Seven other patients were excluded from the study, because of lack of data.

### Endocavitary Electrophysiological Study (EES) and radiofrequency ablation

All Ablation procedures were practiced in similar way: They were always preceded by an Electrophysiological Study in order to determine the mechanisms of target tachycardia and to measure the basic intervals of the conduction. Mainly quadripolar 6F diagnostic catheters were used. Right femoral and right subclavian vein were mainly used to introduce catheters positioning then at the level of the high right atrium, the apex of right ventricle and auriculo-ventricular junction, where Hiss potential is recorded.

After diagnostic stage the decision of ablation is taken during the procedure. In case of attacks of nodal tachycardias linked to duality of nodal conduction ablation of the nodal slow way is performed, in case of

WPW syndrome an ablation of an auriculo-ventricular accessory pathway is practiced.

Ablation is performed with 7 F catheter with distal 4 mm end. It is introduced by right femoral venous or arterial way by femoral right puncture. The current of radio frequency was issued to the point of registration of a slow potential, every possible time, in the point of first auricular depolarization, after only radiological location of the low posteroseptal region, in junctional tachycardias by intranodal reentry slow-fast.

The shooting of radio frequency (generator Radionics RFG 3D: power- 20 watts) were supported 60 seconds in case of induction of a junctional rhythm, fasten during the energy application. They were interrupted in the tenth second in the absence of junctional rhythm, either immediately in case of displacement of the ablation catheter, lengthening of PR interval or impedance elevation.

After every shooting, the inducibility of nodal tachycardia was tested. In case of non-inducibility of arrhythmia, we are measuring the same parameters as in the beginning of the procedure. Finally, the inductibility of a nodal tachycardia was tested last time after the perfusion of isoproterenol (2-3 mg/min). If nodal tachycardia was induced again, the ablation was repeated once more and then controlled in similar way. In case of accessory pathway, the radio frequency current is applied to the place where the shortest AV is recorded in sinus rhythm. It is applied to the place of shortest VAI interval during the orthodromic tachycardia, supported by an accessory pathway with exclusively retrograde conduction. In 2 cases after ablation the absence of anterograde and/or retrograde conduction through an accessory pathway were confirmed by the injection of Striadin (20mg IV bolus) and Isoproterenol.

### Post-ablation follow up

Post-ablation follow-up was assured during successive consultations in the hospital, either by patients' inquiry on the telephone or by their Family doctors and/or cardiologists. The medium follow-up period was  $37.8 \pm 13.9$  months (extreme 13-73 months). Twelve patients were lost.

### Statistics

Data is express by average  $\pm$  SD

AUTHORS	ITURALDE ET AL. 1999		ITURALDE ET AL. 2000		GEELEN ET.AL. 1995		WEERASOORIYA ET AL. 1993		OUR STUDY RESULTS	
Number of patients	Total - 926		Total -1500		Total -357		Total -109		Totally – 54 (in 2 patients -AW+SW)	
	VA	VL	VA	VL	VA	VL	VA	VL	AW	SW
	722	204	1012	488	195	161	77	32	18	38
Success	90%	93%	80.7%	92.5%	97%	97%	83.5%	96.9%	77.8%	97.8%
Complications	1.2%	3.4%	0.98%	2.4%	3%	4%	8.2%		0%	10.5%
Récidive of JT	12.4%	14.2%	9%	10.5%	3%	9%			16.6%	15.8%

**Tab.1** Short-term results of radiofrequency ablation of junctional tachycardia according to different studies.

## RESULTS

### Patients' characteristics

It was junctional Tachycardias by intranodal reentry - slow way (38 cases) or an accessory way (18 cases), among which 2 patients introduced JT by Slow way and an accessory way. Symptoms evolved since  $18.1 \pm 16.8$  years (extreme 0.5-55 years). The rhythm disorders were expressed by disabling palpitations evocating Bouveret disease in 50 cases (92.6%), palpitations - not evocative of Bouveret (APC or VPC) in 1 patient, having linked to lipothymy or syncope at 12 patients. 2 patients were asymptomatic and accessory pathway was determined in these patients by pre-excitation on EKG. 2 patients had ischemic cardiomyopathies, one patient had valvular cardiomyopathy, and 8 patients had hypertensive cardiomyopathies. Other 43 patients had no evident heart disease. Before EES JT was documented in 51 patients, JT accompanied with AF in 1 patient. Before EES arrhythmia was not documented in 2 patients. Before ablation 24 patients (44.4%) had no anti-arrhythmic treatment, other 30 had received different anti-arrhythmic medication: Flecaine (in 11 patients, Cordarone (7pts), Sotalex (6pts), and Isoptine (6pts).

### Results of EES and Localization of Accessory pathway

Slow way was documented in 38 patients (70.4%), and Accessory way in -18 patients (29.6%): Bidirectional Kent in 12 and Unidirectional Kent in 6 patients. In two patients 2 accessory ways were documented. Among them Kent with left localization was found in 13 patients (Lateral-7, Anterior -1, and Posterior-5) and Kent with right localiation-5 (Lateral-2, Posterior-2, Anteroseptal-1).

### The Inducibility of Tachycardias

The most of patients included in this study presented with tachycardia which was easily reproducible on the basic state during EEP. Among the 54 patients, which we have included in our study, we could trigger off supraventricular tachycardias in 51 (94.4%) patients. In the majority of cases, it was just Junctional Tachycardia (in 46 patients), or in association with Auricular Fibrillation - in 5 patient (9.3%). Moreover, Flutter was not induced in no cases.

### Success / failure

The ablation of slow way was performed in 38 patients, among them 37 - successfully with success rate of 97.4%. Among the 18 ablations of different locations of Kent's accessory pathway, we failed in 4 patients. The rate of success was 77.8%.

### Complications

Complications linked to the procedure of EES or Radiofrequency ablation occurred in 4 patients (7.4%); only in patients presenting JT by Slow Way. These complications were: Pericarditis (1), Pneumothorax (1), Thrombosis (1), ablation of the normal way resulted in AV Block 2:1 having required the implementation of PM in 1 patient.

### DISCUSSION

The existence of this not negligible risk and in general benign character of supra-ventricular tachycardias makes that only some patient presenting of this arrhythmia agree to undergo such invasive examination, as endocavitary electrophysiological study and radio frequency ablation. The long-term (5-10 years) functional alterations in patients presenting JT and refusing the medical treatment or radio frequency ablation, were described by Cheng et al. in 1993 (4). These authors noticed the spontaneous disappearing of original tachyarrhythmia in 10.3 % of patients, the induction of new arrhythmia- auricular Fibrillation (AF) in 15.2% of patients, among whom 38.5 % had manifested accessory way.

In our study, carried out on relatively small amount of patients, we had 4 complications in total (7.45 from 54). all of those complications occurred during ablation of slow pathways (10.5% from 38 patients). Radio frequency Ablation of conduction zones originating tachycardias was efficient in the majority of cases (94.4%) and allowed to prevent junctional tachycardias in 80.9% of patients. Ablation induced complete disappearance of symptoms in 64.3% of patient and significant reduction of functional symptoms in 30.9% cases. Only 2 patients from 42 (4.7%) did not show amelioration of their symptoms after ablation, and other 2 patients underwent second ablation.

Radio frequencies had allowed to abolish long-term medical treatment in 83.4% of patients.

### CONCLUSION

Several studies have already shown the short-term results of the RF ablation in patients presenting junctional Tachycardia. Results are totally reassuring and broadly in favor of the treatment by radio frequency, in comparison

with the medical treatment [2,5,6,7] which has such not-desirable numerous non-desirable effect. Our study which concerned 54 patients of 50 years old and more, showed obviously low rate of complications linked to the procedures what is completely comparable to the results of other centers (Tab.1) and studies. That suggests that this procedure should be widely advised and practiced in this population.

### REFERENCES:

1. Brembilla-Perrot B., Houriez P., Claudon O., Burger G., Vancon AC., Mock L. Influence of age on the electrophysiological mechanism of paroxysmal supraventricular tachycardies. *Int J Cardiol* 2001 May; 78 (3) : 293-8
2. Bogun F., Knight B., Weiss R., Bahu M., Goyal R., Harvey M., Daoud E., Strickberger SA, Morady F. Slow pathway ablation with documented but noninducible paroxysmal supraventricular tachycardia. *Journal of Am College of Cardiology* 1996 Oct;28 (4):1000-4
3. Csanadi Z, Klein GJ, Yee R, Thakur RK, LI H. Effect of dual atrioventricular node pathways on atrioventricular reentrant tachycardia. *Circulation* 1995 May 15;91 (10):2614-8
4. Chen S.A., Chiang C.E., Tai CT., Lee SH., Chiou C.W., Ueng KC. , Wen Cheng C.C., Chang M.S. Longitudinal clinical and electrophysiological assessment of tachycardias with symptomatic Wolf-Parkinson-White syndrome and atrioventricular node reentrant tachycardia. *Circulation* 1996 Jun 1;93 (11): 2023-32
5. Geelen P, Andries E, Brugada P. New developments and treatment strategies in patients with supraventricular tachyarrhythmias. *Acta clin Belg* 1995;50 (2):103-13
6. Tiuralde TP., Colin LL., Guevara VM., Rodrigue L., Kershenovich SS. Experience in 1 500 patients undergoing radiofrequency ablation in the treatment of tachycardias. *Arch Inst Cardiol Mex* 200 July-August ; 70 (4) : pp 349-366
7. Ituralde TP., Colin LL., Kershenovich SS., Gonzales HJ. Radiofrequency ablation in the treatment of tachyarrhythmias. Experience concerning 1000 consecutive patients. *Gac med Mex* 1999 Nov -Dec; 135 (6):559-75
8. Michelucci A., Padeletti I L., Fradella GA., et al. Aging and atrial electrophysiologic properties in men. *Int. J. Cardiol* 1984 ; 5 :75-81
9. Tada H., Oral H., Greenstein R., Pelosi F., Knight B.P., Strickberger A., Morady F. Analysis of Age of Onset of Accessory Pathway-mediated Tachycardia in Men and Women. *The American journal of Cardiology*. Vol 89. Issue 4, 15 February 2002. pp 470-471
10. Wu t.J., Chen S.A., Chiang C.E., Yang C.J., Cheng C.C., Wang S.P., Chiang B.N., Chang M.S. Clinical Features and Electrophysiologic characteristics of Accessory Atrioventricular Pathway and Atrioventricular Nodal reentrant Tachycardia: comparative study between young and elderly Patients. *Am Heart J* 1993 Dec; 126 (6) : 1341-8

## Непосредственные результаты удаления нодальной тахикардии у пожилых пациентов по методу радиочастотной абляции

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### Р Е З Ю М Е

Радиочастотная абляция является основным методом лечения нодальной тахикардии, что позволяет уменьшать дозы, или полностью отменять плохо толерируемое или недостаточно эффективное лечение. Согласно единичным указаниям, у пожилых пациентах, из-за наличия сопутствующих хронических патологий, риск осложнений, связанный с эндокавитарным электрофизиологическим исследованием (ЭЭИ) или с радиочастотной абляцией повышается по мере увеличения возраста. Цель исследования – оценка непосредственных результатов удаления нодальной тахикардии с помощью Радиочастотной абляции и определение осложнений, связанных с этой процедурой у лиц пожилого возраста. Обследовано 54 пациентов (26 женщин, 28 мужчин) в возрасте 60 лет и старше (средний возраст 61,0±8,7 лет). Установлены хорошие результаты предотвращения нодальной тахикардии и низкий процент осложнений, связанных с проведенными процедурами.

**Ключевые слова:** нодальная тахикардия, эндокавитарное электрофизиологическое исследование, радиочастотная абляция