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Original article

Prevalence, causes of reappearance of symptoms or preexcitation syndrome after ablation of accessory pathway and management

Prévalence et causes de la réapparition de symptômes ou d'un syndrome de préexcitation ventriculaire après ablation d'un faisceau accessoire et conduite à tenir

C. Federspiel , B. Brembilla-Perrot *

Cardiology, CHU of Brabois, rue du Morvan, 54500 Vandœuvre-lès-Nancy, France

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Abstract

Aim. – The purpose of the study was to look for the prevalence, significance and management of preexcitation syndrome (PS) or symptoms reappearance after accessory pathway (AP) ablation. AP ablation actually is the first treatment of PS.

Methods. – Successful AP ablation was performed in 261 patients; reappearance of symptoms or PS on ECG occurred in 47 patients (18%) from 20 minutes to several years. Their data were compared with remaining patients.

Results. – Recurrences were more frequent in patients with spontaneous malignant form (34 vs. 21%), in congenital heart disease (4.2 vs. 0%) ($P < 0.002$), in case of complication (11 vs. 2%) ($P < 0.007$) and of a longer duration of applications (304 ± 209 vs. 188 ± 182 sec) ($P < 0.019$). Forty percent of patients had the same symptoms and electrophysiological data as before ablation. Twenty-four percent had an improvement of symptoms and/or electrophysiological data. However, 3 initially asymptomatic patients became symptomatic after ablation. Twenty-six percent had another AP or another rhythm disorder. We recommend transesophageal electrophysiological study for the control because only 40% of patients required second ablation.

Conclusions. – Reappearance of symptoms or a PS on ECG after AP ablation was not rare (18%) and was inconsistently associated with the reappearance of all initial AP electrophysiological properties. Only 40% of patients required a second AP ablation. Another arrhythmia was possible. Non-invasive second evaluation should be preferred. However, asymptomatic patients before ablation could become symptomatic.

Keywords: Accessory pathway; Ablation; Follow-up; Electrophysiological study

Résumé

Le but de l'étude a été d'évaluer la prévalence, la signification et la conduite à tenir en cas de réapparition d'un syndrome de préexcitation ventriculaire (SPV) ou de symptômes après l'ablation d'un faisceau accessoire (FA), traitement de choix actuel du SPV.

Méthodes. – L'ablation d'un FA a été réalisée avec succès chez 261 patients ; la réapparition de symptômes ou du SPV est survenue chez 47 patients (18 %) entre 20 minutes jusqu'à plusieurs années. Leurs données ont été comparées à celles des autres patients.

Résultats. – Les récidives ont été plus fréquentes chez les sujets avec une forme maligne spontanée (34 vs 21 %), en cas de cardiopathie congénitale (4,2 vs 0 %) ($p < 0{,}0002$), en cas de complication (11 vs 2 %) ($p < 0{,}007$) et d'une plus grande longueur des applications (304 ± 209 vs 188 ± 182 sec) ($p < 0{,}019$). Quarante pour cent des patients avaient les mêmes symptômes et données électrophysiologiques qu'avant l'ablation. Vingt-quatre pour cent avaient une amélioration des symptômes et/ou des données électrophysiologiques. Cependant, 3 patients initialement asymptomatiques étaient devenus symptomatiques après l'ablation. Vingt-six pour cent avaient un autre FA ou un autre trouble du rythme. Nous recommandons une exploration électrophysiologique transœsophagienne pour le contrôle car seulement 40 % des patients nécessitaient une 2e ablation.

* Corresponding author.
E-mail address: b.brembilla-perrot@chu-nancy.fr (B. Brembilla-Perrot).

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Conclusions. – La réapparition de symptômes ou d'un SPV après l'ablation d'un FA n'a pas été rare (18 %) mais était inconstamment associée à une réapparition des propriétés initiales du FA. Seulement 40 % des patients nécessitaient une seconde ablation. Une autre arythmie était possible. Une seconde exploration non invasive devrait être préférée. Cependant, des patients asymptomatiques avant l'ablation pouvaient devenir symptomatiques après.

Mots clés : Faisceau accessoire ; Ablation ; Suivi ; Étude électrophysiologique

1. Introduction

Radiofrequency ablation of the accessory pathway (AP) is the usual treatment of symptomatic preexcitation and of asymptomatic preexcitation with signs of malignancy at electrophysiological study [1,2].

However, a recurrence of symptoms and/or preexcitation on the electrocardiogram may occur in some patients.

The main objective of the study was to evaluate the recurrence rate and the factors associated with recurrence of symptoms and/or preexcitation on the electrocardiogram after ablation of overt AP. The second objective was to evaluate the electrophysiological data after reappearance and to define the methods of risk assessment after recurrence.

2. Patients and methods

2.1. Patients

Between 1994 and 2011, 297 patients, 181 males, 116 females; mean age 34 ± 16.5 years, with an overt AP were referred for accessory pathway radiofrequency ablation. They were issued from a group of 765 patients consecutively referred for the evaluation of a preexcitation syndrome.

Patients with concealed AP and those with an indication of ablation which was not performed (patient refusal, anteroseptal accessory pathway with high-risk of atrioventricular block) were excluded from the study.

Ablation was successful in 261 patients. The success was defined as the anterograde and retrograde conduction lost at least 20 minutes after the last radiofrequency application. The patients were from 10 to 76 years old (mean 36 ± 16 years). Twenty patients had an underlying heart disease: ischemic heart disease ($n = 6$), valvular heart disease ($n = 4$), tachycardiomyopathy ($n = 3$), alcoholic dilated cardiomyopathy ($n = 1$), hypertensive heart disease ($n = 1$), idiopathic dilated cardiomyopathy ($n = 1$), Fabry disease cardiomyopathy ($n = 1$), history of closure of the ductus artriosus ($n = 1$), Ebstein's anomaly ($n = 1$), and left ventricular non-compaction ($n = 1$).

Ablation was unsuccessful in 36 patients, aged from 12 to 76 years (mean 38 ± 20). Failure of ablation was related to several causes as inadequate contact of ablation's catheter, a broad AP, the occurrence of a major complication as tamponade or complete atrioventricular block, the intermittent conduction in the AP, the induction of a sustained atrial fibrillation and/or an extended procedure. These patients refused a second ablation.

Among the total population, 11 patients (3.7%) had a major complication: tamponade ($n = 4$), transitory ischemic stroke ($n = 1$), atrioventricular block ($n = 4$) with 2 permanent complete AV block requiring the implantation of a pace-maker and 2 regressive complete AV blocks, hematoma at the puncture site ($n = 3$) (Table 1).

2.2. Electrophysiological study (EPS)

EPS was performed without sedation as previously described [3]. Briefly incremental atrial pacing until the highest rate conducted 1/1 through the AP and/or the atrioventricular (AV) node and programmed atrial stimulation were performed. When a fast supraventricular tachycardia was induced, the protocol was stopped. In absence of induction of a tachycardia conducted through the AP at a rate higher than 250 bpm, isoproterenol (0.02 to 1 $\mu g.min^{-1}$) was infused to increase the sinus rate to at least 130 bpm and the pacing protocol was repeated.

2.3. Definitions

The AP's location was determined with the 12-lead ECG recorded in maximal preexcitation and then by the study of retrograde conduction over AP. The diagnosis of multiple accessory pathways was retained only if AP's had different locations as left lateral and septal or right lateral and septal or left lateral and right lateral: in the left free wall location, the ablation could require the application of radiofrequency energy apparently at two sites, but it could be the same large accessory pathway. In the posteroseptal location left and right septal applications can be required to suppress the preexcitation.

Table 1
Details on the AP ablation-related major complications.

Complication	Number	Age	Sex	AP location
Tamponade	4 (1.3%)	22	M	LPS
		31	F	AS
		66	F	LL
		51	M	LL
AV block	4 (1.3%)	50	F	LPS
		49	M	AS
		42	M	LPS
		49	M	RPS
Stroke	1 (0.3%)	31	M	LL
Pseudoaneurysm requiring surgery	3 (1%)	61	F	LL
		55	F	LL
		66	M	LPS

AP: accessory pathway; AS: anteroseptal; LL: left lateral; LPS: left posteroseptal; RPS: right posteroseptal.