# Tachycardie jonctionelle persistante par rythme réciproque chez un fœtus : Un challenge diagnostique et thérapeutique

## Fetal Persistent junctional reciprocating tachycardia : a diagnostic and a therapeutic challenge.

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**RÉSUMÉ**

Nous rapportons le cas d'une femme enceinte de 22 ± 1 semaines d'aménorrhées qui s'est présentéé pour une tachycardie fœtale supra-ventriculaire (186 battements/ minutes). L'échocardiographie foetale en mode T M révélait des caractéristiques en faveur du diagnostic de tachycardie jonctionnelle persistante par rythme réciproque avec un rapport ventriculo-auriculaire (AV) / auriculo-ventriculaire (AV) de 1/1. Par ailleurs le foetus n'avait aucun signe d'insuffisance cardiaque ou d'anasarque. Un traitement transplacentaire associant de l'amiodarone et la digoxine a permis de ralentir le rythme foetal. Le diagnostic de tachycardie jonctionnelle persistante par rythme réciproque a été confirmé en postnatal. Le nouveau-né a été mis sous l'association proponalol et amiodarone. Un retour au rythme sinusal a été obtenu rapidement au bout de 9 jours. Actuellement, le patient se porte bien à l'âge de 10 mois, avec absence de récidive de la tachycardie

**Conclusion:** Notre observation illustre une forme particulière de tachycardie jonctionnelle persistante par rythme réciproque diagnostiquée en anténatal qui se caractérise par une bonne tolérance clinique, une absence d'évolution vers la cardiomyopathie et une réponse rapide et inhabituelle aux antiarythmiques.

**Mots-clés**

Tachycardie jonctionnelle, persistante par rythme réciproque , feotus, antiarythmiques

**SUMMARY**

A mother presented with a fetus at 22±1 weeks of gestation with a sustained supraventricular tachycardia (SVT) at initially 186 beat per minute (bpm). The fetal M-mode echocardiography showed a 1/1 atrio ventricular ratio (with short atrioventricular (AV) interval and a long ventriculo-atrial (VA) interval, suggesting a Persistent junctional reciprocating tachycardia (PJRT) . Upon initial present no signs of heart failure or hydrops were noted and treament was initiated with amiodarone and digoxin. Fetus heart rate slowed .Postnatal electrocardiogram Confirmed the diagnosis of PJRT. New born was put on amiodarone and proparonal). Sinus rhythm was rapidly achieved 9 days later .The patient doing well at 10 months of age with maintain of sinus rhythm.

**Conclusion:** our case report illustrates a particular form of JRT diagnosed prenatal PJRT, characterized by a good clinical tolerance, its absence of evolution towards cardiomyopathy and its rapid and unusual response to antiarrhythmics

**Key-words**

Persistent junctional reciprocating tachycardia, fetus, antiarrhythmics

## INTRODUCTION

Persistent junctional reciprocating tachycardia (PJRT) is a rare variant of persistent reentry tachycardia leading to dilated cardiomyopathy and requires agressive therapeutic management. Typically the tachycardia is incessant. It is an orthodromic reciprocating tachycardia that uses a slow-conducting accessory pathway commonly located in the right posterior septum near the ostium of the coronary sinus (1) .Although some reports exist(2) on fetuses diagnosed with supraventricular tachycardia that proved to be PJRT postnatally, little is known about the clinical and outcome characteristics of prenatally diagnosed PJRT.

## CASE REPORT

A mother presented with a fetus at 22±1 weeks of gestation with a sustained supraventricular tachycardia (SVT) at initially 186 beat per minute (bpm). The fetal M-mode echocardiography showed a 1/1 atrio ventricular ratio (Figure1) with short atrioventricular (AV) interval and a long ventriculo-atrial (VA) interval, suggesting a slow conducting accessory pathway (figure1) .

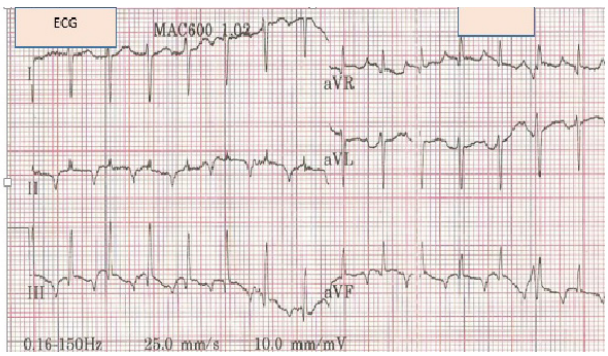


**Figure 1:** The fetal M-mode echocardiography showed a 1/1 atrio ventricular ratio with short atrioventricular (AV) interval and a long ventriculo-atrial (VA)

Upon initial presentation no signs of heart failure were noted and treament was initiated with amiodarone with the doses of 600 mg/day during 5 days. This resulted in only a minimal decrease in heart rate to 180 bpm. Digoxin was added at 0,125 mg twice a day to 400mg of amiodarone during 5 days. Fetus heart rate slowed at 175 bpm. A regularly follow up every 2 weeks was required during treatment period. Fœtal echocardiography during follow up have never demonstrate signs of heart failure ,hydrops or valvular regurgitation.The fetus was delivered by caesarean section ( for obstetrical cause) at a gestational age of 37weeks. A healthy boy of 3340 gram was born with Apgar scores of 9/9 without clinical signs of heart failure, and he was transferred to our department for management. Postnatal electrocardiogram showed a tachycardia with heart rate at 190 bpm, inverted Pwaves in the inferior leads and a P-R interval shorter than the R-P interval confirming the diagnosis of PJRT (figure 2 ). Echocardiography did not reveal any abnormalities.

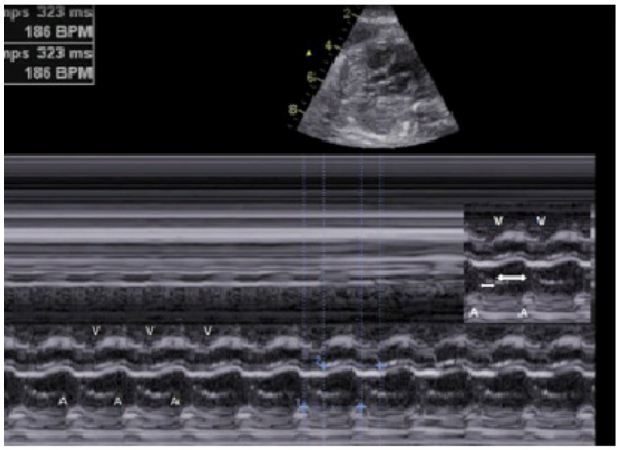


**Figure 2**: Postnatal electrocardiogram showed a tachycardia with heart rate at 190 bpm, inverted P waves in the inferior leads and a P-R interval shorter than the R-P interval confirming the diagnosis of PJRT

Electrocardiogram record confirmed the incessant character of this arrhythmia that begun after a sinus tachycardia, and which was characterized by alternance of episodes of fast tachycardia and of short periods of remission (Figure3 A)

New born was put on amiodarone (500mg/m²) once a day and proparonal 3 mg/kg (twice a day ). Sinus rhythm at 144 bpm was rapidly achieved 9 days later

Patient was put on amiodarone (250 mg/m²) daily and proponolol 3 mg/kg/day in order to maintain sinus rhythm. Evolution was favorable , with absence of signs or symptoms of recurring tachycardia, and rythm monitoring showed absence of supraventricular tachychardia or accessory path-way, the main heart rate over 24h in electrocardiogram record was 120 bpm (figure 3B) and echocardiography was normal. The patient doing well at 10 months of age with maintain of sinus rhythm.

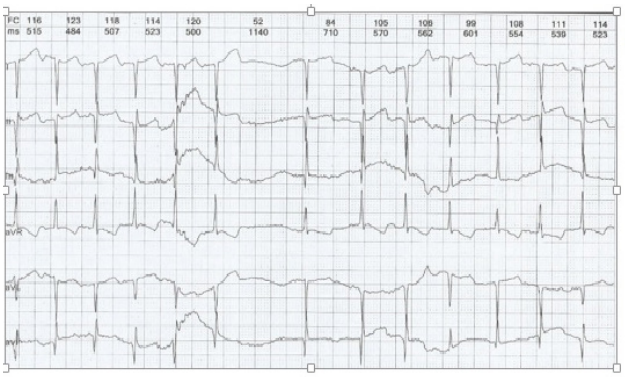

**Figure 3:** Electrocardiogram record confirmed the incessant character of this arrhythmia that begun after a sinus tachycardia, and which was characterized by alternation of episodes of fast tachycardia and of short periods of remission

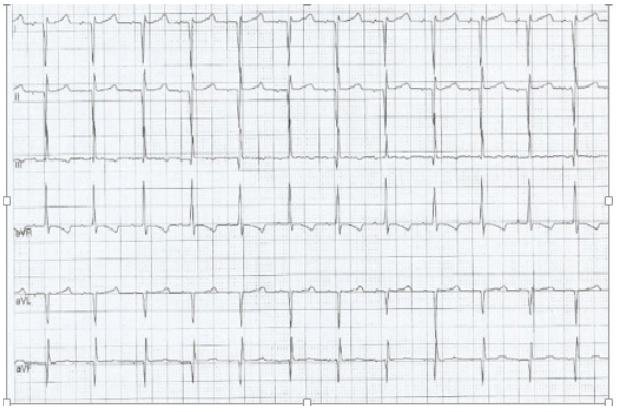

**Figure 4**: Rhythm monitoring showed absence of supraventricular tachychardia or accessory path-way

## DISCUSSION

PJRT is a rare form of re-entrant SVT characterized by an often incessant tachycardia at a rate of 120-250 beats per minute with inverted P waves in the inferior leads with an accessory retrograde pathway with slow conduction. This leads to a characteristic long RP interval exceeding the PR interval. There is a typical 1:1 conduction (3). The literature reports that the tachycardia can be diagnosed in adults, children and usually can be recognized in early childhood (3,4), but PJRT diagnosed antenatally have been described in few reports(2,5) and also reported in our case.

M-mode echocardiography is the most commonly used method of diagnosis in fetal arrhythmias through measuring the atrioventricular (AV) and ventriculoatrial (VA) interval dividing these intervals results in a VA/AV ratio, which is a measure of the conduction properties through eventual retrograde accessory pathways (5).

Fetal echocardiography in our case showed a short Atrioventricular (AV) interval and a long ventriculo-atrial (VA) interval, that could be found in atrial ectopic tachycardia, but the incessant nature and the recurrence of the tachycardia after a few sinus beats relieve the confusion (3).

PJRT is commonly incessant from birth or infancy (3). Its persistence over a long period of time may lead to a tachycardia-induced cardiomyopathy (6) which has described with all types of SVT including PJRT, but is mostly associated with a fetal heart rate above 220 bpm.

Althougth tachycardia was persistant in fetal period and post natal period, we don't objectived in our case any signs of cardiomyopathy this can be explained by the relative slow initial rhythm rate comparing with what's reported ( 2 ) and because of the effect of antiarrhythmic drugs on heart rate. To prevent cardiomyopathy from chronic tachycardia, a treatment of PJRT should be initiated in fœtus. Transplacental therapy can be effective, but uncertainty remains regarding the best médication for rhythm conversion (7). Digoxin is often used as first-line therapy due to its low maternal risk profile and experience of use.(7). However, more recent publications have questioned the efficacy of transplacental digoxin, particularly in fetuses with hydrops fetalis, and suggest that flecainide or sotalol may be better first-line options (8). In our case, since there were no signs of hydrops ,we did not prescribe flecainide and we used association of amiodarone and digoxin .

Altough posnatal diagnosis is easy, treatment is difficult in neonatate and its objectif is to slow the rhythm since the effective therapy was radiofrequency ablation which was not feasable in fetus and in new born ( 9 ).

EHRA and AEPC-Arrhythmia Working Group (10) conclude that combination of antiarrythmic drugs Ic or III with beta-blokers and digoxine had shown the most effective treatment. Our attitude was similar to what recommended (10) since we had used amiodarone and proponalol.

One of the main finding in our case is the relatively rapidity resolution of PJRT. In contrast to what has been observed in smaller series of pediatrics patients reported so far, spontaneous resolution of PJRT was not so uncommon (10) and such an evolution happened sometimes many years after diagnosis of tachycardia but in our case a sinus

rhythm was obtained rapidly after 9 days of birth.

Another interesting finding of our report is the remarkable efficiency of antiarrhythmic drugs, In fact sinus rythm was obtained rapidly and maintained by using medical bitherapy alone up to 10 moths .Usual efficiency of these drugs allowed delay of radiofrequency ablation until patients have reached an adequate growth, wheras many reports (9) described PJRT us a arrhythmia considered to be usually refractory to drug treatment (3,4) and requiring the use radiofrequency ablation which is a technique that should be reserved for older patients because complications when realized in infancy are more frequent (9 )

## CONCLUSION

Our case report illustrates the fact that PJRT is a diagnostic and a therapeutic challenge for physicians. The characteristics of our prenatal PJRT cases included its good clinical tolerance, its absence of evolution towards cardiomyopathy despite its incessant and permanent character and its rapid and unusual response to antiarrhythmics postnatally, allowed us to delay radiofrequency ablation at a higher age.

**Conflict of interest :** No conflict of interest

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