

心小静脉相关的右侧房室旁路消融 1 例

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Catheter ablation of a small cardiac vein-related right accessory pathway: a case report

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Summary A 20-year-old man with Wolff-Parkinson-White syndrome was referred for re-evaluation after a failed attempt to ablate the right free-wall accessory pathway (AP). His resting surface electrocardiogram (ECG) suggested a septal AP. The earliest anterograde ventricular activation was documented at the 9-10 o'clock of the tricuspid annulus, and ablation at this site was irresponsible. This earliest retrograde atrial activation was documented at the atrial side during right ventricular pacing. While maneuvering the catheter in this site for further mapping, it was positioned in an orifice with impedance rising from 120 Ω to 250 Ω , and the AP was temporarily blocked. Selected venography by ablation catheter revealed small cardiac veins drained into the atrium by this site. The distance between the orifice and the tricuspid annulus was 1.5 cm. Ablation at the margin of this orifice with 35 W, 43°C and 30 ml/min saline irrigation speed successfully eliminated the retrograde conduction of the AP within 3 s and continued to 60 s. No periprocedural complications occurred, and ECG showed no evidence of ventricular pre-excitation after ablation. At 6-months follow-up, the patient experienced no tachycardia recurrence.

Key words preexcitation syndrome; atrioventricular reentrant tachycardia; supraventricular tachycardia; accessory pathway; venography; catheter ablation

1 病例资料

患者,男,20岁,曾因心动过速就诊于当地医院,考虑预激综合征,在三尖瓣环游离壁侧消融失败。患者窦性心律下体表心电图显示(图1):V₁导联无r波、呈QS型、预激波为负,Ⅲ导联预激波为负正双向,Ⅱ、aVF导联预激波为正,推测可能为间隔旁路。经股静脉途径送入冠状窦10极电极,右心室4极电极,经SL1长鞘送入7F冷盐水灌注消融导管(Thermocool Smart Touch™,D curve,Biosense Webster),应用Carto3三维电解剖标测系统(Biosense Webster,Inc.,Diamond Bar,CA,USA)进行标测。通过X线透视、右房造影影像和腔内心电图AV比例<1/2来定位三尖瓣环,标测到his电位的位置对应为三尖瓣环1点,通过超过4个均匀分散的取点重建三尖瓣环。窦律下标测前向传导,间隔部激动晚于游离壁,最早心室激动位于三尖瓣环9~10点,在此处多点试行放电消融20s无效。起搏心室下,标测逆传心房最早激动位置,三尖瓣环上的逆传最早位点处的心房波距离心室刺

激信号120ms,AV不融合;而在低位右心房标测到整体逆传最早位点处,心房波距离心室刺激信号100ms,局部电位呈大A小V,AV比例约5:1,试行放电消融20s,未阻断旁路传导;继续局部精细标测时,阻抗突然从120 Ω 上升到250 Ω ,并出现机械压迫阻断旁路,提示此处有特殊结构(图2)。在此处应用盐水功率模式,35W、43°C、30ml/min消融,3s后旁路阻断,继续消融至60s,并在靶点附近多点巩固消融,测量靶点距离三尖瓣环1.5cm。经消融导管在靶点处选择性造影(图3),可见心小静脉显影,造影剂经血管逆行流向心室侧,最终可见心中静脉显影。观察30min,旁路传导无恢复,不能再诱发心动过速,无并发症发生。随访半年,患者未复发心动过速。

2 讨论

本文报道1例罕见的心小静脉相关的右侧房室旁路预激综合征,通过消融心小静脉在心房插入位点而成功阻断房室旁路传导。临床实践中,房室旁路的消融位点通常是在三尖瓣瓣环或者二尖瓣瓣环,其解剖基础是异常的肌束连接瓣环两侧的心房和心室,形成异常房室传导通路,同正常房室传

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导通路构成折返环路,产生房室折返性心动过速。右侧游离壁旁路消融失败主要原因在于导管不稳定,而心小静脉介导的心外膜旁路是一个罕见的导致消融失败的原因,世界上仅有个案报道^[1]。据文献报道,通过人体解剖发现仅 2%(1/50)的心小静脉开口于右心房^[2]。

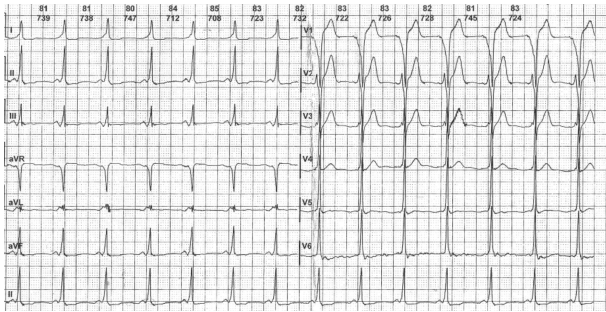
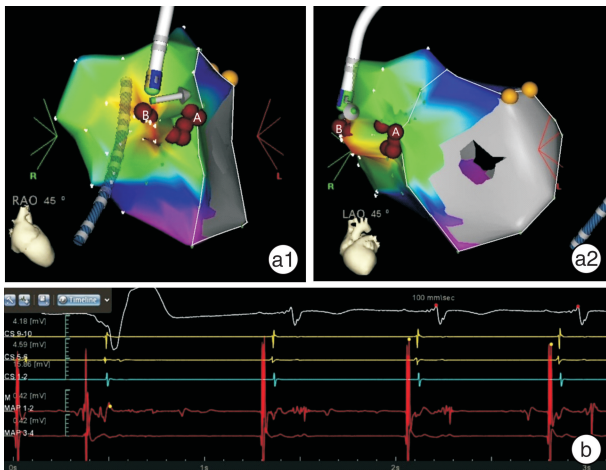


图 1 心电图

Figure 1 Electrocardiogram



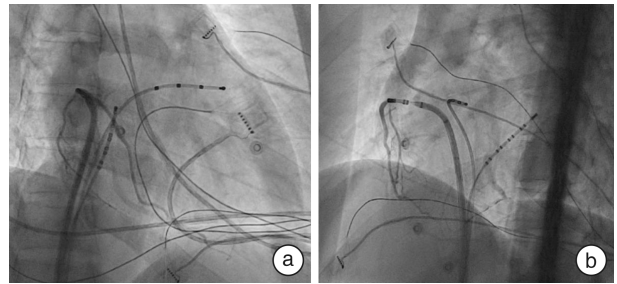
a1:右前斜体位;a2:左前斜体位;b:预激波突然消失,PR 间期恢复正常,旁路一过性阻滞。首先标测前向传导最早心室激动位于三尖瓣环 9~10 点,试行多点消融无效(位置 A);再标测逆传心房最早激动位置不在三尖瓣环,而是在邻近的右心房,试行消融无效(位置 B)。

图 2 序贯标测及消融

Figure 2 Sequential mapping and anatomical combined ablation

体表十二导联心电图 V₁ 导联无 r 波、呈 QS 型,或者呈 rS 型但 r 波非常微小,这样的特征常可见于间隔旁路。但本例激动标测示间隔部前传及逆传均不早,逆传心房最早激动位置不在三尖瓣环,而是在低位右心房,要考虑到有可能存在远离

三尖瓣环的心房插入位点,这样的特殊心电图表现可能是因为长的斜行的心外膜旁路连接心房和远离三尖瓣环的心室插入位点^[1]。



a:右前斜体位;b:左前斜体位。

图 3 选择性静脉造影

Figure 3 Selected venography

本病例标测前向传导最早心室激动位于三尖瓣环 9~10 点,但消融无效,分析是因为尽管瓣环上是小 A 大 V,但 V 波为远场电位,AV 并不融合,并不代表精确的心室插入点;起搏心室,标测逆传心房最早激动位点,三尖瓣环处没有标测到局限的逆传最早激动位点,而是在低位右心房,精细标测最早激动位点处出现阻抗突然增高,提示此处有特殊结构;选择性造影明确心小静脉开口于此处,为心小静脉相关的心外膜旁路,此处消融成功。对于这种特殊类型旁路,在起搏心室下标测逆传最早心房激动很重要,因为心外膜旁路在心室插入位点难以在心内膜消融阻断,只能通过消融心房侧心外膜旁路插入位点而成功。

在心小静脉右房开口处消融,导管稳定性和应用盐水灌注压力导管很重要,若导管头端落入开口中,阻抗和压力将骤然升高,会难以放电,消融也有导致心包填塞并发症的风险;而在高流量灌注下将导管头端稳定在开口边缘进行消融,阻抗相对低且比较稳定,可有效并且安全的消融。

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