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100 例旁路介导的心动过速及射频消融

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摘 要 目的:探讨旁路介导的心动过速及射频消融的方法对旁路消融的影响。方法:100 例旁路介导的心动过速经常规电生理检查,双旁路 5 例,单旁路 95 例,共 105 条旁路。用动脉鞘-Webster 消融导管标测和 Swartz 鞘-Daig 消融导管标测二尖瓣环或三尖瓣环,以旁路顺传的最早心室激动或逆传的最早心房激动处为消融靶点。结果:顺向型房室折返性心动过速 94 例,逆向型房室折返性心动过速 3 例,房颤 7 例,房扑 1 例。97(97/105,92%)条旁路消融成功,其中动脉鞘-Webster 消融导管标测成功 85 条,12 条未成功的改用 Swartz 鞘-Daig 消融导管标测成功。结论:两种消融方法的运用可提高旁路消融的成功率。

主题词 预激综合征/治疗;心动过速;导管消融术

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100 Patients with Accessory Pathway-Mediated Tachycardias and Radiofrequency Ablation

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Abstract **Objective**: To investigate accessory pathway-mediated tachycardias and the effect of radiofrequency ablative methods on the outcomes of ablation for accessory pathways. **Methods**: 100 cases of accessory pathway-mediated tachycardias were treated by radiofrequency ablation during routine electrophysiologic study. There were 105 accessory pathways-95 cases had a single accessory pathway, 5 cases had two accessory pathways. Radiofrequency current was delivered to the site where the earliest ventricular activation through anterograde conduction of accessory pathway or the earliest atrial activation through retrograde conduction of accessory pathway, recorded by Webster ablative catheter inserted through arterial sheath or Daig ablative catheter inserted through Swartz sheath mapping the mitral or tricuspid annulus. **Results**: Orthodromic reciprocating tachycardia was induced in 94 cases. Antidromic reciprocating tachycardia was induced in 3 cases. Atrial fibrillation was induced in 7 cases. One case had atrial flutter before the operation. 97 accessory pathways were successfully ablated, 85 of which were successfully ablated by Webster ablative catheter inserted through arterial sheath, the other 12 unsuccessfully ablated accessory pathways were successfully ablated by Daig ablative catheter inserted through Swartz sheath. **Conclusion**: The application of the two ablative methods could achieve a high successful rate of accessory pathway ablation.

Subject headings pre-excitation syndroms/therapy; tachycardia; catheter ablation

自从 1987 年 Borgreffe 等[1]报道射频消融旁路以来,射频消融已成为旁路介导的心动过速病人最有效治疗方法。我们总结 1995~1998 年 100 例旁路介导的心动过速的射频消融,报道如下。

1 材料和方法

1.1 病例选择

100 例旁路的病人男 62 例,女 38 例,年龄 12~68 岁,均有明确心动过速史,并经发作时心电图记录或术前食管心房调搏检查证实。所有病人术前经体检,X 线胸部照片、超声心动图等检查,除 1 例三尖瓣下移畸形,1 例老年性主动脉瓣轻度狭窄,2 例二尖瓣脱垂外,其余未发现器质性心脏病的证据。术前停用抗心律失常药物 72 h。

1.2 电生理检查及射频消融方法

常规电生理检查[2], 100 例旁路病人双旁路 5 例, 单旁路 95 例, 共 105 条旁路(左侧游离壁 85 条、间隔 10 条、右侧游离壁 10 条), 其中 42 条旁路具有顺向和逆向传导功能, 62 条仅有逆向传导功能, 1 条仅有前向传导功能。旁路初步定位: ①左侧旁路根据冠状窦电极标测; ②右侧旁路根据体表 12 导联预激图形及三尖瓣环 6、8、10、12 点处粗标。消融标测详见参考文献[3] [4] 报道: ①动脉鞘-Webster 消融导管标测: 消融导管经股动脉或股静脉穿刺放置的动脉鞘至二尖瓣环瓣下/上, 或三尖瓣环瓣上初步确定的旁路部位标测; ②Swartz 鞘-Daig 消融导管标测: 根据旁路初步定位选择相应型号 Swartz 鞘经股静脉上行贴靠右房三尖瓣环, 房间隔穿刺贴靠左房二尖瓣环, Daig 消融导管经该鞘管至三尖瓣环或二尖瓣环瓣上标测。显性旁路在窦性心律时标测心室最早激动点, 隐匿性旁路在心动过速或心室起搏时标测心房最早激动点以确定消融靶点图。左侧旁路消融能量 25 ~ 30 W, 右侧旁路消融能量 30 ~ 50 W, 先试放电 5 ~ 10 s, 若旁路阻断, 持续巩固放电 60 ~ 120 s。消融成功终点: 电生理检查显示旁路的前传及逆传功能丧失, 不能诱发房室折返性心动过速(AVRT)。

1.3 随 访

消融后在监护室观察 3 d, 每日复查心电图, 24 h 后复查超声心动图。出院后定期门诊随防, 随访时间(14 ±13)月。有阵发性心悸者, 行食管心房调搏检查。

2 结 果

100 例旁路中, 前传旁路有效不应期(284.23 ± 33.68) ms, 逆传旁路有效不应期(287.42 ±45.24) ms。97 例诱发 AVRT, 顺向型(O-AVRT) 94 例(94%), O-AVRT 平均周期长度(320.40 ±36.28) ms, 其中 5 例伴房颤, 逆向型(A-AVRT) 3 例(3%), 平均周期长度(296.67 ±15.28) ms。2 例仅诱发房颤, 即房颤共 7 例(7%), 其中 1 例转为室颤, 术前持续性房扑 1 例(1%)。105 条旁路部位及射频消融结果见表 1。

表 1 105 条旁路射频消融结果

Table 1 Outcome of radiofrequency ablation of 105 accessory pathways (*n*)

Accessory pathway location	Webster catheter through arterial sheath			Daig catheter through Swartz sheath		
	Accessory pathways	Success	Failure	Accessory pathways	Success	Failure
Left free wall	85	76	9	6	6	0
Left posteroseptal	1	0	1	0	0	0
Right posteroseptal	8	7	1	0	0	0
Right anteroseptal	1	0	1	1	1	0
Right free wall	10	2	8	5	5	0
Total	105	85	20	12	12	0

105 条旁路经动脉鞘-Webster 消融导管标测消融成功率 81%, 其中左侧旁路为 88%, 右侧旁路仅 47%。失败的 20 条旁路中 12 条改用 Swartz 鞘-Daig 消融导管标测消融全部成功, 最终消融成功率 92%, 左侧旁路为 95%, 右侧旁路为 79%。

3 讨 论

3.1 旁路介导的心动过速与射频消融

旁路介导的心动过速类型各家报道不一, 但主要的心动过速均为 AVRT, 其次为房颤。Calkins[3] 等报道 250 例旁路射频消融治疗, 诱发 O-AVRT 188 例(75.2%), A-AVRT 2 例(0.8%), 房颤 26 例(10.4%)。Swartz[4] 等报道 114 例旁路射频消融治疗, 诱发 O-AVRT 112 例(98.2%), 房颤 51 例(47.7%), 本组病人中 O-AVRT 为 94%, 房颤 7%, A-AVRT 3%, 房扑 1%。本组术中房颤发生率明显低于 Swartz 等的报道。这与我们采用避免房颤诱发的措施有很大关系, 其措施包括: ①避免短的联律间期的 S_1S_2 及短周期 S_1S_1 刺激; ②心房导管操作轻柔, 减少对心房壁的机械刺激; ③避免消融导管放电时易位; ④诱发房室折返性心动过速后, 应

尽快终止。我们体会, 射频消融旁路的电生理检查及导管机械刺激诱发房颤或房扑可产生以下不利后果: ①快速的心房冲动经旁路下传造成快速心室率, 增加血流动力学不稳定或室颤的危险性。本组早期 1 例左侧旁路经 S_1S_1 240 ms 右房刺激, 诱发房颤, 经旁路下传的 R-R 间期为 180 ms, 房颤约 10 s 转为室颤, 经 200 J 直流电除颤后复律。Swartz 等报道诱发的 51 例房颤中 2 例转为室颤。②增加射频消融的难度和延长射频消融时间。房颤时显性旁路可成功地消融, 靶点的选择主要取决于靶点处振幅较大的旁路电位, 以及 V 波最大本位曲折较体表心电图预激波的提前程度, 成功标志为旁路的前向传导阻断, 即宽大畸形 QRS 波消失[5,6]。本组中 1 条后间隔旁路由于反复发作房颤使消融导管标测困难, 以至消融失败; 1 例房扑伴左侧旁路前传在房扑时虽然消融成功, 但难度较大, 操作时间较长。因此我们认为旁路介导的心动过速的病人射频消融时应尽可能避免诱发房颤或房扑。如术中出现房颤或房扑不能自动转复, 消融旁路有困难, 可采用电复律后消融旁路。

3.2　旁路的标测与消融

本组 105 条旁路用动脉鞘-Webster 消融导管标测消融成功率 81%, 其中消融失败的 12 条旁路, 改用 Swartz 鞘-Daig 消融导管标测消融成功, 使最终消融的成功率达 92%; 右侧旁路用动脉鞘-Webster 导管消融成功率远较左侧低(47%与 88%), 6 条用动脉鞘-Webster 导管消融失败的右侧旁路改用 Swartz 鞘-Daig 导管消融全部成功。两种消融方法的掌握和应用有助于提高消融成功率。我们对两种导管标测消融的体会: ①动脉鞘-Webster 消融导管标测时, 消融导管的头端电极指向瓣环面, 导管只能逐点标测房室环, 标测点是非连续的, 不容易比较确定哪点标测图为消融靶点图, 靶点图的正确识别需要经验的积累; 消融右侧游离壁旁路时, 消融导管缺乏支撑, 头端电极不易与三尖瓣环的游离壁保持密切接触。②Swartz 鞘-Daig 消融导管标测时, 消融导管的头端电极指向与瓣环走行一致, 导管在 Swartz 鞘支撑下可保持头端电极与瓣环紧密接触, 推送或回抽导管, 头端电极可沿瓣环线性连续标测, 容易比较和识别哪点的标测图为消融靶点图; Swartz 鞘的型号选用是左前外侧旁路 SL_1, 左外侧 SL_2, 右前间隔 SR_1, 右前外侧 SR_2, 右外侧 SR_3。

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