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论著

导尿管引导双极消融钳技术在瓣膜置换同期房颤治疗中的应用

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[摘要] **目的** 探讨心脏瓣膜置换术中应用双极射频消融治疗房颤更安全、简洁的操作技术。**方法** 建立导尿管引导双极射频消融钳技术,观察在163例瓣膜置换同期消融治疗房颤患者中应用疗效,其中,男性55例,女性108例,年龄27~70岁,平均47.6岁,房颤病史均超过1年,最长15年,左心房最大内径45~80 mm,左心室内径43~74 mm,左心室射血分数40%~70%。本技术在常规体外循环下进行,体外循环转流后依次分离左、右肺静脉,先套过普通尿管,再以导尿管作为牵引,引导双极射频钳通过肺静脉后壁并完整包绕肺静脉,先进行左、右肺静脉消融隔离,再进行左侧上、下肺静脉,上、下肺静脉与左心耳之间的消融,缝闭左心耳,经左房或房间隔径路完成瓣膜置换手术,最后进行右心房消融。**结果** 本技术在163例瓣膜置换术同期双极射频消融患者中应用,手术操作顺利,无组织撕裂,无术中意外出血,以及手术后再止血患者,死亡1例(0.6%),其余均顺利出院。**结论** 该技术简化常规双极射频隔离肺静脉的手术操作技术,有效降低常规双极射频方法的手术风险,减少手术并发症,是一种有效的技术方法。

[关键词] 心房纤颤;双极;射频消融术;风湿性心脏病
[中图法分类号] R454.1; R540.46; R541.75 [文献标志码] A

Urine catheter guided bipolar ablation clamp in surgical treatment of atrial fibrillation associated with valve replacement

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[**Abstract**] **Objectives** To investigate a more simple and safe surgical technique for the treatment of atrial fibrillation (AF) with bipolar ablation during the valve replacement. **Methods** From January 2010 to October 2011, a total of 163 patients were enrolled in this study to investigate the effect of urine catheter-guided bipolar ablation in the surgical treatment of AF, including 55 males and 108 females aged from 27 to 70 years (mean 47.6 years). All the patients had at least 1 year's history of AF, and the longest one was 15 years. Maximum diameter of the left atrium ranged from 45 to 80 mm, diameter of the left ventricle from 43 to 74 mm and ejection fraction of the left ventricle from 40% to 70%. All the procedures were performed under the cardiopulmonary bypass (CPB). After the start of CPB, the left and right pulmonary veins (PV) were carefully separated and encircled with a urine catheter. With the guidance of the catheter, the bipolar ablation clamps were positioned precisely around the PV. Circle ablation of the right and left PVs was performed, followed by the straight-line ablation between the left inferior and superior PVs and between the left PVs and the opening of the left atrial appendage. Then, the opening of the left atrial appendage was closed with continuous suture, followed by the valve replacement and the ablation of the right atrium. **Results** This urine catheter-guided bipolar ablation was successfully applied in 163 patients with AF undergoing valve replacement. The surgical process was uneventful in all the patients without any tear of myocardial or vascular tissue and without bleeding events during and after operations. Except for 1 death (0.6%), all the patients were discharged as expected. **Conclusion** This technique can effectively simplify the procedure of the ablation of PVs, reduce the associated risk and decrease the incidence of the related complications.

[**Key words**] atrial fibrillation; bipolar; radiofrequency ablation; rheumatic heart disease

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近年,双极射频钳消融治疗心房纤颤(atrial fibrillation,AF),因其临床疗效确切,创伤小,引起临床广泛关注。但双极射频钳应用中仍存在一些问题,双臂钳的前、后臂在通过左、右肺静脉时会互相限制和影响,增加操作难度,同时,在穿过左心房后壁时潜在损伤心房后壁,发生出血等严重并发症的危险[1-3]。本研究拟改进双极射频钳操作技术,简化双极射频钳应用技术,提高应用双极射频钳的安全性,从而保证瓣膜置换手术同期双极消融治疗AF的转复成功率,缩短手术时间和降低并发症。

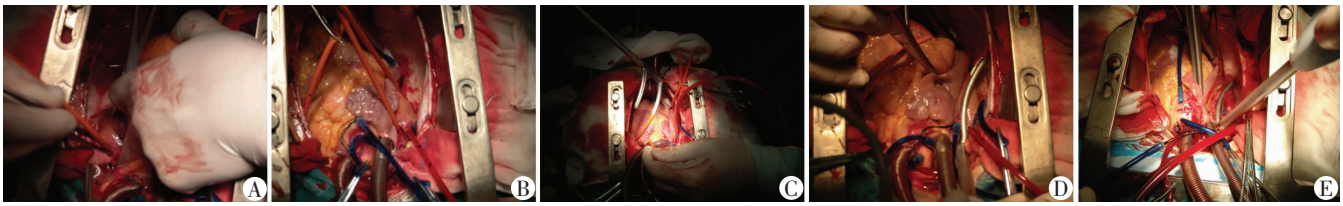
1 资料与方法

收集本院2010年1月至2011年10月163例瓣膜病合并AF的患者,采用新桥医院心外科建立的导尿管引导双极射频消融钳技术,进行瓣膜置换同期双极射消融治疗AF,其中,男性55例,女性108例。年龄27~70岁,平均47.6岁。临床症状为劳力性心累、气促,所有患者AF病史均超过1年,最长15年,术前均行12导联心电图检查证实AF。超声心动图提示左心房最大内径45~80 mm,左心室内径LVd(A-P)43~74 mm,左心室射血分数(LVEF)40%~70%。病例选择:风湿性心脏瓣膜病患者合并AF,病程≥1年,拟行瓣膜置换手术;超声心动图提示左心房最大内径≤80 mm;患者及家属接受同期双极射频消融手术。排除标准:术前有病态窦房结综合征;AF患者,术前室性心率低于50次/min;超声心动图提示左心房最大内径>80 mm;再次手术或心包粘连严重患者。

手术均在全身静脉复合麻醉体外循环下进行,术中常规建立体外循环,上、下腔静脉插入直角插管,备用10号或12号普通尿管两根,转流后依次根据心脏大小,采用不同尺寸游离钳,游离左、右肺静脉,先穿过导尿管,再与双极射频钳后臂连接,引导射频钳穿过肺静脉,全部包绕肺静脉,再进行消融隔离(图1、2)。具体方法为:①右肺静脉套管:先游离右肺静脉上缘,再游离右肺静脉下缘,用手指探查右肺静脉后壁有无粘连,并适当分离,采用相应大小的心耳钳由右肺静脉下缘,经右肺静脉上缘出来,套过备用10号或12号普通尿管;②左肺静脉套管:先适当游离左肺静脉上缘,再用手指探查左肺静脉后壁有无粘连,并适当分离,采用对应大小的心耳钳由左肺静脉下缘,经左肺静脉上缘出来,套过备用10号或12号普通尿管,如果游离困难,可以先游离左上肺静脉,套尿管,再游离左下肺静脉套同一尿管;③引导双极射频钳:射频钳后壁插入导尿管,术者扶持射频钳,由助手轻轻牵引导尿管,射频钳顺着牵引方向,自然通过肺动脉后壁;④肺静脉消融:牵引导尿管使双极射频钳完整包绕肺静脉入口,去除导尿管,消融隔离肺静脉,先进行左肺静脉消融隔离,再行右肺静脉消融隔离,消融钳尽量靠近房间沟处进行消融。最后,进行其他消融线。

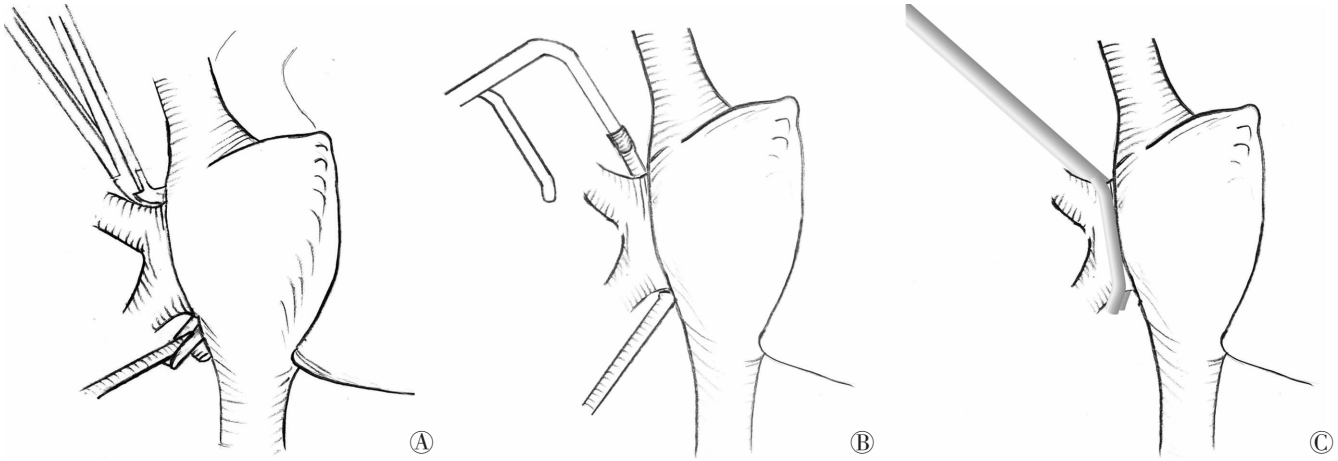
2 结果

本技术操作顺利,无组织撕裂,无术中意外出血,无因出血2次开胸患者,死亡1例,死亡率0.6%,术后第2天因肺高压危象死亡1例。



A:游离左肺静脉并套导尿管;B:左、右肺静脉套导尿管后;C:双极射频钳后臂套插入导尿管;D:导尿管牵引双极射频钳包绕肺静脉;E:双极射频消融隔离肺静脉

图1 导尿管引导双极射频钳技术和射频消融治疗风湿性心脏瓣膜病合并房颤过程



A:分离肺静脉并套导尿管;B:引导双极射频钳通过肺静脉;C:射频消融隔离肺静脉

图2 导尿管引导双极射频钳的射频消融示意图

术后返监护室当天窦性心律148例(90.79%),交界性心律9例(5.52%),房颤6例(3.68%),心律慢,应用临时起搏器51例(31.29%);无Ⅱ、Ⅲ度房室传导阻滞发生;162例痊愈出院,出院时窦性心律141例(87.04%),交界性心律5例(3.09%),房扑5例(3.09%),房颤11例(6.79%),Ⅰ度房室传导阻滞5例,右束支传导阻滞3例,ST改变38例。

3 讨论

AF是临床最常见的心律失常,风湿性心脏病(风心病)又是最常见的心脏疾病之一,而风心病患者60%左右伴有持续性难治性AF[4-6],目前,内科药物治疗持续性AF难以转复为窦性,导管消融治疗成功率低,对合并心脏器质病变的AF极少采用导管治疗;迷宫手术是外科治疗AF经典、有效的方法,但操作复杂、费时、创伤大,并发症多,临床应用同样较少[7]。

近年,外科消融治疗AF技术引起广泛关注,特别是双极射频钳消融治疗房颤,因其同时进行心内、外膜联合消融,透壁性完全,消融线又相互连续,临床疗效确切,创伤小,临床应用逐渐增多。但双极射频钳应用中仍存在一些问题,首先,双臂钳在游离左、右肺静脉时,由于要考虑前臂和后臂的因素,通过左、右肺静脉时会互相有一些影响和限制,当心脏较小时,射频钳臂显得过大,过长,不容易通过后壁;而当心脏增大明显时,射频钳臂又相应过短,不能保全肺静脉,或只能采用上、下肺静脉分别钳夹,增加操作,延长时间;而且,心房壁较薄,射频钳两个臂由于互相限制,在穿过心房后壁时容易损伤后壁,发生出血等严重并发症[8-9]。

鉴于直接应用双极射频钳存在问题,本研究建立导尿管引导双极射频钳技术,其优势体现在:①相较于双极钳的两个臂,游离钳为单极臂,且操作柄短,弧度自然,可以根据心脏大小选用适当大小的游离钳,游离时方向性、灵活性好,容易控制,既简化操作,创伤小,降低了手术风险。②采用游离钳先进行分离,再通过导尿管牵引双极射频钳,一方面射频钳臂易于通过左心房后壁,避免双极钳转向性不好,通过左心房后壁困难,降低损伤后壁的风险;同时,当左心房增大、肺静脉增宽明显时,射频钳臂相应过短,不能包全肺静脉开口,牵引导尿管可以起到一定辅助作用,更容易使双极射频钳完整包绕肺静脉入口,再去除导尿管,消融隔离肺静脉更彻底。③操作简单,射频钳套入导尿管后比较牢固,轻轻牵拉导尿管,射频钳就随导尿管自然潜行,射频钳通过肺静脉后,轻轻撤去导尿管,就可钳闭射频钳进行消融。④采用普通尿管,取材方便,成本低,不增加成本;引导射频钳方便、安全,导尿管柔软、光滑,有弹性,对心肌组织无创伤,一般选用10号或12号普通尿管最好。

通过163例临床应用,我们认为该技术能有效简化常规双极射频隔离肺静脉的手术操作,有效降低常规双极射频方法的手术风险,减少手术并发症,临床应用效果好。

参考文献:

[1] Sims J B, Roberts W C. Comparison of findings in patients with versus without atrial fibrillation just before isolated mitral valve replacement for rheumatic mitral stenosis (with or without associated mitral regurgitation) [J]. Am J Cardiol, 2006, 97(7): 1035-1038.

[2] Lakkireddy D, Nagarajan D, Biase L D, *et al*. Radiofrequency ablation of atrial fibrillation in patients with mitral or aortic mechanical prosthetic valves: a feasibility, safety, and efficacy study[J]. Heart Rhythm, 2011, 8(7): 975-980.

[3] Srivastava V, Kumar S, Javali S, *et al*. Efficacy of three different ablative procedures to treat atrial fibrillation in patients with valvular heart disease: a randomised trial [J]. Heart Lung Circ, 2008, 17(3): 232-240.

[4] 李勇, 马瑞彦, 肖颖彬, 等. 风湿性二尖瓣病变并发心房颤动患者483例临床分析[J]. 第三军医大学学报, 2010, 33(10): 1048-1051.

[5] McCarthy P M, Kruse J, Shalli S, *et al*. Where does atrial fibrillation surgery fail? Implications for increasing effectiveness of ablation[J]. J Thorac Cardiovas Surg, 2010, 139(3): 860-867.

[6] 肖颖彬, 陈林, 钟前进, 等. 心脏跳动中氩气刀心内膜消融治疗心脏瓣膜病合并慢性心房纤颤[J]. 第三军医大学学报, 2008, 30(21): 2058-2059.

[7] Cox J L, Ad N, Palazzo T, *et al*. Current status of the Maze procedure for the treatment of atrial fibrillation [J]. Semin Thorac Cardiovasc Surg, 2000, 12(1): 15-19.

[8] Kim J B, Yun T J, Chung C H, *et al*. Long-term outcome of modified maze procedure combined with mitral valve surgery: analysis of outcomes according to type of mitral valve surgery[J]. J Thorac Cardiovasc Surg, 2010, 139(1): 111-117.

[9] Schulenberg R, Antonitsis P, Stroebel A, *et al*. Chronic atrial fibrillation is associated with reduced survival after aortic and double valve replacement[J]. Ann Thorac Surg, 2010, 89(3): 738-744.

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