



Editorial

Neo atrioventricular conduction after Bjork operation

Surgical incision was thought to completely eliminate conduction by creating a surgical scar along the incision line. The surgical treatment of accessory atrioventricular pathways used to be performed in symptomatic supraventricular tachycardia patients [1,2]. The acute success rate of these reports was favorable.

Cox/maze procedure was also effective for drug refractory atrial fibrillation. However, it became more popular to use radiofrequency energy [3] or cryosurgery instead of cut and saw procedure [4–7] probably because of the wideness and completeness of surgery scar.

Atrio-atrial conduction following cardiac transplantation has already been reported in cardiac transplantation patients [8–10]. The possible mechanism of this phenomenon is a bridge of excitable myocardium growing across the atrio-atrial anastomosis, allowing direct conduction of cardiac action potentials [9].

The present paper by Law et al. was a patient with atrioventricular reentrant tachycardia using retrograde ventriculo-atrial (VA) conduction 6 years after Bjork palliation. Before palliation, there was no antegrade atrial-ventricular conduction and this patient had no episode of supraventricular tachycardia before Bjork surgery. They confirmed the shortest VA conduction at the mouth of right atrial appendage where the anastomosis was carried out to the right ventricular outflow tract. They successfully eliminated VA conduction at that site. From this report and previous reports [11–16], we realize that surgical incision scar is not a complete obstacle to conduction but could be a neo tissue conduction and could be a new arrhythmogenic focus.

From these results, we have to take care of the gap that might be present or the neo atrio-atrial conduction that might exist along the line of surgical incision. Part of the reason of difficulty in catheter ablation for atrial tachycardia in complicated atrial surgery, such as Mustard or Senning procedure, may be due to the gap or neo atrio-atrial conduction along the line of incision.

References

- [1] Sealy WC, Gallagher JJ, Wallace AG. The surgical treatment of Wolff–Parkinson–White syndrome: evolution of improved methods for identification and interruption of the Kent Bundle. *Ann Thorac Surg* 1976;22:443–57.
- [2] Holmes Jr DR, Danielson GK, Gersh BJ, Osborn MJ, Wood DL, McLaran C, Sugrue DD, Porter CB, Hammill SC. Surgical treatment of accessory atrioventricular pathways and symptomatic tachycardia in children and young adults. *Am J Cardiol* 1985;55:1509–12.
- [3] Chiappini B, Martín-Suárez S, LoForte A, Arpesella G, Di Bartolomeo R, Marinelli G. Cox/Maze III operation versus radiofrequency ablation for the surgical treatment of atrial fibrillation: a comparative study. *Ann Thorac Surg* 2004;77:87–92.
- [4] Cox JL, Schuessler RB, Boineau JP. The surgical treatment of atrial fibrillation. I. Summary of the current concepts of the mechanisms of atrial flutter and atrial fibrillation. *J Thorac Cardiovasc Surg* 1991;101:402–5.
- [5] Cox JL, Canavan TE, Schuessler RB, Cain ME, Lindsay BD, Stone C, Smith PK, Corr PB, Boineau JP. The surgical treatment of atrial fibrillation. II. Intraoperative electro-physiologic mapping and description of the electrophysiologic basis of atrial flutter and atrial fibrillation. *J Thorac Cardiovasc Surg* 1991;101:406–26.
- [6] Cox JL, Schuessler RB, D'Agostino HJ, Stone CM, Chang BC, Cain ME, Corr PB, Boineau JP. The surgical treatment of atrial fibrillation. III. Development of a definitive surgical procedure. *J Thorac Cardiovasc Surg* 1991;101:569–83.
- [7] Cox JL. The surgical treatment of atrial fibrillation. IV. Surgical technique. *J Thorac Cardiovasc Surg* 1991;101:584–92.
- [8] Anselme F, Saoudi N, Redonnet M, Letac B. Atrioatrial conduction after orthotopic heart transplantation. *J Am Coll Cardiol* 1994;24:185–9.
- [9] Lefroy DC, Fang JC, Stevenson LW, Hartley LH, Stevenson WG. Recipient-to-donor atrioatrial conduction after orthotopic heart transplantation: surface electrocardiographic features and estimated prevalence. *Am J Cardiol* 1998;82:444–50.
- [10] Rothman SA, Miller JM, Hsia HH, Buxton AE. Radiofrequency ablation of a supraventricular tachycardia due to interatrial conduction from the recipient to donor atria in an orthotopic heart transplant recipient. *J Cardiovasc Electrophysiol* 1995;6:544–50.
- [11] Hager A, Zrenner B, Brodherrheberlein S, Steinbauerrosenthal I, Schreieck J, Hess J. Congenital and surgically acquired Wolff–Parkinson–White syndrome in patients with tricuspid atresia. *J Thorac Cardiovasc Surg* 2005;130:48–53.
- [12] Liberman L, Pass RH, Alfayyadh MI, Hordof AJ. Radiofrequency ablation of an accessory pathway in a surgically created atrioventricular Fontan anastomosis: case report and review of previous published cases. *Pacing Clin Electrophysiol* 2000;23:914–6.
- [13] Case CL, Schaffer MS, Dhala AA, Gillette PC, Fletcher SE. Radiofrequency catheter ablation of an accessory atrioventricular connection in a Fontan patient. *Pacing Clin Electrophysiol* 1993;16:1434–6.
- [14] Peinado R, Gnoatto M, Merino JL, Oliver JM. Catheter ablation of multiple, surgically created, atrioventricular connections following Fontan Bjork procedure. *Europace* 2007;9:848–50.
- [15] Razzouk AJ, Gow R, Finley J, Murphy D, Williams WG. Surgically created Wolff–Parkinson–White syndrome after Fontan operation. *Ann Thorac Surg* 1992;54:974–7.
- [16] Rosenthal E, Bostock J, Gill J. Iatrogenic atrioventricular bypass tract following a Fontan operation for tricuspid atresia. *Heart* 1997;77:283–5.

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