Letters to the Editor

Fading magic of maze procedure

Pankaj Kumar Mishra*
Department of Cardiothoracic Surgery,
Glasgow Royal Infirmary,
16 Alexandria Parade, Glasgow G31 2ER,
United Kingdom

Received 15 November 2005; accepted 12 December 2005

Keywords: Atrial fibrillation; Maze procedure

I read with interest a recent article by Reston and Shuhaiber [1] where they have analysed the reported clinical outcome of maze-related surgical procedures for intractable atrial fibrillation (AF). I congratulate them for this excellent meta-analysis [1]. I would like to add a few comments.

Maze procedure is an excellent example of a technique which was grabbed by an impatient scientific community which believes in evidence-based practice but easily accepts and gets carried away by camouflaged data. As appropriately pointed out by Reston and Shuhaiber [1], the literature evaluating the clinical outcomes after maze procedure suffers from several shortcomings, particularly small sample sizes and selection bias. I would like to add (without daring to elaborate any further!) here a publications bias as well.

Maze-related procedures might be helpful in eliminating AF, but the long-term benefits in terms of mortality, morbidity and quality of life is yet to be proved. Most of us tend to forget that Cox et al. described this procedure after performing most of the maze surgeries in patients with lone AF and not those with valvular heart disease. Besides, the classical Cox maze procedure is technically complex, time consuming and leads to an increased rate of post-operative bleeding and need for permanent pacemakers. This led to several simpler modifications. In the absence of randomised controlled trials comparing the efficacy and/or utility of these procedures, we are suffering from tubular vision—everybody is seeing and finding what he or she wants to see in the statistical data presented.

This meta-analysis identified only four randomised studies out of which two studies had noncomparable patient groups [1]. Furthermore, a closer look reveals that two of these studies used radiofrequency ablation (RF). Data obtained from RF procedures cannot be compared to any other surgical technique as RF has got some unique advantages such as decreased incidence of postoperative bleeding. Apart from the outcomes which the authors have addressed in their meta-analysis, it will be interesting to know the impact of various techniques on AF recurrence rate, left ventricular systolic function and the quality of life.

Recently, Chaput et al. [2] reported that the conversion to sinus rhythm did not improve long-term survival or reduce the incidence of embolic complications after valve surgery. The efforts involved and the benefits obtained from conversion to sinus rhythm (if at all attained) are really questionable in patients with prosthetic valves who in any case will remain on anticoagulants. This question becomes particularly relevant if one takes into account the complications reported even with modified anti AF procedures [3, 4]. We should not forget that in lone AF rate management gives comparable results to rhythm management [5]. In other words surgeons should not be made to believe that medical management of chronic AF is a thing of past. It is still very much relevant.

References


* Tel.: +44 141 2114731/5645206; fax: +44 141 5520987/2114845.
E-mail address: mishrapk_25@yahoo.com.

Reply to the Letter to the Editor

Reply to Mishra

Jeffrey H. Shuhaibera*—James T. Restonb

aUniversity of Illinois, 614-G Laffin, Chicago, IL 60607, USA
bDepartment of Health Technology Assessment, ECRI, Plymouth Meeting, PA, USA

Received 9 December 2005; accepted 12 December 2005

Keywords: Maze procedure; Atrial fibrillation; Randomized controlled trials
We thank Dr Mishra for his comments regarding our recent publication [1], which presented a statistical summary of the results of controlled trials evaluating the Cox-Maze III and its various modifications. We agree that publication bias could be another shortcoming of the maze literature. However, more randomized trials would be needed to allow testing which could determine whether publication bias was present and whether it was large enough to affect the findings of a meta-analysis.

The decision to include the various energy sources in our systematic review was based on the fundamental concept that they can produce transmural atrial lesions. These transmural lesions can ablate the atrial fibrillation pacemakers around the pulmonary vein ostia as well as interrupt the macro re-entry circuits. Although current understanding questions role of transmurality [2], it remains one of the basic foundations of arrhythmia ablation [3,4]. Sophisticated mapping techniques will be necessary to guide ablation strategies and control its efficacy in the future.

We expected that studies using radiofrequency ablation would have a lower post-operative bleeding rate than studies using surgical incisions. For this reason, we did not combine all of the studies in our meta-analysis of post-operative bleeding. Instead, we separately meta-analyzed studies using radiofrequency ablation and studies using surgical incisions for this one outcome. As expected, we found that the maze procedure had a higher rate of post-operative bleeding when using surgical incisions. However, for all other outcomes we combined studies using different procedures because we had no a priori reason to believe that the different techniques would lead to differences in these outcomes. Indeed, our meta-analyses of all other outcomes found no statistically significant heterogeneity, indicating that differences in procedure did not lead to differences in these outcomes.

An outstanding question remains: Does eradication of atrial fibrillation prevent its associated complications in the medically refractory population? This question is hard to answer at this time. The answer may depend on whether structural changes in the heart follow atrial fibrillation or whether atrial fibrillation followed the structural changes (e.g., mitral valve incompetence). The reported success rate of the maze (conversion to sinus rhythm) is highest in patients with mitral valve incompetence, suggesting that treatment of an arrhythmia associated with structural changes has a better outcome with surgery than medical therapy. The latter may be more appropriate for lone atrial fibrillation. We await further data in this field and continue to recommend the maze procedure for conversion to sinus rhythm when operating on structural changes such as mitral valve incompetence.

The maze procedure appears to be reasonably benign when used as an adjunct in patients receiving mitral valve surgery. An important unanswered question is whether patients receiving a prosthetic valve will gain an additional benefit from maze, since, as Dr Mishra pointed out, these patients will remain on anticoagulants. The major concern from our study was the non-robust finding of a trend towards increased use of pacemakers when using the maze procedure, and a higher rate of post-operative bleeding when using surgical incisions instead of radiofrequency ablation. There was also a non-significant trend toward higher mortality with the maze procedure, although more studies will be needed to determine whether this trend is real. We patiently await further well-designed randomized trials evaluating the maze procedure to confirm and extend the findings of our study. Future trials should place particular emphasis on outcomes such as stroke, quality of life and survival, and should compare results in patients receiving mitral valve repair versus mitral valve replacement.

References


* Corresponding author. Tel.: +1 312 421 8508; fax: +1 312 404 8710.
E-mail address: Jeffrey01@mac.com.