



MITRAL ANNULOPLASTY RING SUTURE DEHISCENCE: IN SEARCH OF MORE ROBUST TECHNIQUES

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MITRAL ANNULOPLASTY RING SUTURE DEHISCENCE: IN SEARCH OF MORE ROBUST TECHNIQUES

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Reply to the Editor:

We thank Spratt and colleagues for their enthusiastic response¹ to our case report.² Our case report does not provide any direct evidence regarding the use of a flexible ring or running suture; however, we agree that it enforces the notion that more durable annuloplasty approaches may exist. The positive experience of these and other surgeons when using flexible annuloplasty rings secured via running suture suggests that this approach is worthy of increased consideration.

We note that the use of numerous interrupted sutures may at least seem to offer greater durability than would a running suture. Whereas any break in a running suture leaves the entire ring unsecured, numerous mattress sutures offer a degree of redundancy against suture breakage. Yet, a previous study observed the ultimate tensile strength of 3–0 TiCron sutures to be 17.8 N, even after knotting³; we recently showed interrupted suture holding strength in the ovine mitral annulus to be 4.9 ± 2.8 N (2–0 TiCron sutures).⁴ These facts establish tissue rupture, not suture breakage, as the likeliest mode of dehiscence and thus provide some mechanistic support to the running suture's durability.

Spratt and colleagues have collectively performed a substantial volume of mitral valve repairs using flexible rings secured with running sutures, and their reported suture dehiscence outcomes are impressive. It is plausible that an optimally implanted ring using this technique is better able to distribute tension than is a rigid ring with interrupted sutures. To address this question with certainty, the expected suture forces should be quantified with a technique analogous to our latest reports.^{2,4} Indeed, we are underway studying the capacity for ring flexibility to relieve suture forces. Spratt and colleagues make a compelling case that the running suture should be investigated similarly.

Our case report highlights the importance not only of the expected suture forces after a given annuloplasty approach but also of the robustness of that approach against suture misplacement. We observed that a small misplacement was sufficient to tear loose one mattress suture,² even from what is typically the strongest segment of the annulus (the anterior aspect, between the trigones).⁴ Although the freedom from dehiscence reported by

Spratt and colleagues is exciting, precision of suture placement may be of the greatest concern at lower-volume centers. Bolling and colleagues⁵ have reported that, among all surgeons and hospitals in The Society of Thoracic Surgeons Adult Cardiac Surgery Database, the median number of isolated mitral procedures annually was 5. In this landscape, the most robust combination of ring type and suturing technique may prove most effective in preventing suture dehiscence. Thus far, the identification of such an optimum approach remains elusive.

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