interrupted sutures are placed toward the annulus.

We agree with Dr Miller's comment in the discussion that this is not a new technique. It is true that it is highly similar to McGoon's technique of triangular plication of the prolapsing portion of the posterior leaflet resulting from ruptured chordae, which was published in 1960,² not in 1985, as suggested by the reference misquoted by Tsukui and colleagues.¹ (Reference 12 by Tsukui and colleagues to "McGoon DC. Repair of mitral insufficiency due to ruptured chordae tendineae. *J Thorac Cardiovasc Surg.* 1985;89:491-8" seems to be an incorrect rendering of Orszulak TA, Schaff HV, Danielson GK, Piehler JM, Pluth JR, Frye RL, et al. Mitral regurgitation due to ruptured chordae tendineae: early and late results of valve repair. *J Thorac Cardiovasc Surg.* 1985;89:491-8.)

McGoon, of course, did not perform ring annuloplasty because rings were not introduced until 9 years after he published his technique.

Gerbode and colleagues³ performed plication of the posterior leaflet for posterior leaflet prolapse resulting from ruptured chordae tendinae and first published it in 1962. Plication involves 4 layers of leaflet tissue, 2 on each side, which adds to stability of the plication line, in contrast to suture after resection, which involves 2 layers and is more prone to rupture. Through the years, this technique has been modified. Plication of the posterior leaflet toward the ventricle with interrupted mattress sutures and addition of posterior annuloplasty with stabilization of the repair by an autologous pericardial strip has become the standard concept for mitral valve repair at our center for posterior leaflet prolapse, for ruptured chordae tendinae, and even in repair for endocarditis.^{4,5} Tsukui and colleagues¹ unfortunately seem to be unaware of these references.

With regard to Miller's comment on why surgeons are trying to reincarnate

old techniques, this plication technique has, in fact, not been abandoned nor forgotten, but continues to show good long-term functional outcome. The folding mitral valve repair technique used by Tsukui and colleagues¹ is, therefore, not new, but another version of the modification by Gerbode and colleagues³ of the original McGoon² plication principle. Further modifications have been continuously proposed and tested, including our contributions.^{4,5}

It seems to us that the issue here is purely semantic and not technical. Hence, to allege that the technique described by Tsukui et al¹ is innovative is misleading.

We thank Anne Gale, ELS, for editorial assistance.

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References

1. Tsukui H, Umehara N, Saito H, Saito S, Yamazaki K. Early outcome of folding mitral valve repair technique without resection for mitral valve prolapse in 60 patients. *J Thorac Cardiovasc Surg.* 2013;145:104-9.
2. McGoon DC. Repair of mitral insufficiency due to ruptured chordae tendinae. *J Thorac Cardiovasc Surg.* 1960;39:357.
3. Gerbode F, Kerth WJ, Osborn JJ, Selzer A. Correction of mitral insufficiency by open operation. *Ann Surg.* 1962;155:846-53.
4. Hetzer R, Delmo Walter EM. Repair of congenital mitral valve insufficiency. *Op Techn Thorac Cardiovasc Surg.* 2010;15:260-72.
5. Hetzer R, Delmo Walter EMB, Huebler M, Alexi-Meskishvili V, Weng Y, Nagdyman N, et al. Modified surgical techniques and long term outcome of mitral valve reconstruction in 111 children. *Ann Thorac Surg.* 2008;86:604-13.

<http://dx.doi.org/10.1016/j.jtcvs.2013.01.025>

Reply to the Editor:

I thank Drs Hetzer and Walter for their letter regarding our article in the January 2013 issue of the *Journal*. I am embarrassed to note that our article failed to reference McGoon's article, published in 1960, describing the

technique for triangular plication of the prolapsing posterior leaflet caused by ruptured chordae tendineae. Also, I thank Hetzer and Walter for reminding us of previous works from Gerbode and colleagues and from their own institution. I have enjoyed these articles.

Our mitral valve repair technique, folding mitral valve repair, does seem to be similar to other techniques reported by several authors; however, what we intended to emphasize in our article is the simplicity and reversibility of this technique, rather than its novelty. We expect these features to contribute to a greater repair rate and to provide a chance for residents to gain experience in mitral valve repair. The novel aspect of our technique is the expansion of indication to the anterior leaflet, not A2, and the commissural leaflet after successful experiences with the posterior leaflet. To the extent of my research, there have been no articles reporting detailed outcomes of anterior and commissural leaflet repair with plication or folding techniques, such as we reported.

Finally, I appreciate the commentary of Drs Hetzer and Walter, and I look forward to reporting late outcomes of our technique in the future.

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<http://dx.doi.org/10.1016/j.jtcvs.2013.02.066>

IS GENDER-SPECIFIC SURVIVAL IN PATIENTS UNDERGOING RADIAL ARTERY GRAFTING INFLUENCED BY HORMONE LEVELS?

To the Editor:

We read with great interest the article by Dimitrova and colleagues¹ on

improvement in the 15-year survival in women with radial artery (RA) grafting. We congratulate Dimitrova and coworkers on their well-designed analysis and the results in their publication. They concluded that women who received 2 arterial conduits, coronary artery bypass grafting (CABG) with left internal thoracic artery and RA, had a significant survival benefit up to 15 years compared with women who received a saphenous vein (SV) as a second conduit for myocardial revascularization.

Use of the RA as the second conduit of choice for CABG has several advantages: the length of the artery per se (~20 cm), its large diameter, its exposure to arterial blood pressure, the thickness of the wall, and its lower susceptibility to atherogenesis. Clinical studies have documented the superior long-term patency of the RA over SV grafts.²

It would be interesting to compare the survival of men undergoing CABG with the left internal thoracic artery and RA with those who received SV grafting. There may be a difference in survival between men and women using the RA as a second conduit.

Study results have shown enhanced physiologic characteristics related to endothelial production or vessel relaxation in response to nitric oxide in the RA compared with the SV.³ Joannides and colleagues⁴ reported the influence of gender difference on RA dimension in flow-dependent dilatation. Men have a higher diameter of the RA compared with women. Herman and coworkers⁵ have shown a deleterious effect of physiologic levels of androgen hormone in men and a decrease of androgen levels related to age as a benefit in coronary artery disease and endothelium function in developing the atherogenic process.

Majmudar and colleagues⁶ showed the effects of estrogen in increasing nitric oxide release in the arterial vasculature. Estrogen has its own cardioprotective effect, elevating high-density lipoprotein, lowering

low-density lipoprotein, reducing fibrinogen, maintaining the vasculature tone, inhibiting platelet aggregation and adhesion, and inhibiting the development of atherosclerotic plaques. This study was specifically targeted to forearm and arm arterial vascular resistance.

We can speculate that estrogen hormone in the premenopausal woman plays a positive role in the modulation of endothelium flow-mediated dilatation of the RA. On the other hand, men who receive RA conduits should have better results when they are aged more than 60 years because of diminishing androgen hormone and its deleterious effect on the arterial wall.⁵

These complex gender- and age-specific considerations should be taken into account in future studies of arterial conduits for revascularization.

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References

1. Dimitrova KR, Hoffman DM, Geller CM, Ko W, Lucido DJ, Dincheva GR, et al. Radial artery grafting in women improves 15-year survival. *J Thorac Cardiovasc Surg*. 2012 [Epub ahead of print].
2. Goldman S, Sethi GK, Holman W, Thai H, McFalls E, Ward HB, et al. Radial artery grafts vs saphenous vein grafts in coronary artery bypass surgery: a randomized trial. *JAMA*. 2011;305:167-74.
3. Shapira OM, Xu A, Aldea GS, Vita JA, Shemin RJ, Keaney JF Jr. Enhanced nitric oxide-mediated vascular relaxation in radial artery compared with internal mammary artery or saphenous vein. *Circulation*. 1999;100(19 Suppl):II322-7.
4. Joannides R, Costentin A, Iacob M, Compagnon P, Lahary A, Thuillez C. Influence of vascular dimension on gender difference in flow-dependent dilatation of peripheral conduit arteries. *Am J Physiol Heart Circ Physiol*. 2002;282:H1262-9.
5. Herman SM, Robinson JT, McCredie RJ, Adams MR, Boyer MJ, Celermajer DS. Androgen deprivation is associated with enhanced endothelium-dependent dilatation in adult men. *Arterioscler Thromb Vasc Biol*. 1997;17:2004-9.
6. Majmudar NG, Robson SC, Ford GA. Effects of the menopause, gender, and estrogen replacement therapy on vascular nitric oxide activity. *J Clin Endocrinol Metab*. 2000;85:1577-83.

<http://dx.doi.org/10.1016/j.jtcvs.2013.02.081>

Reply to the Editor:

We thank the authors for their comments and interest in our study showing improved long-term survival after coronary artery bypass grafting (CABG) using the radial artery (RA) in women. We agree with the many important advantages of RA grafting, which they so clearly outline. We also found their novel suggestion that age-dependent levels of androgens and estrogens may affect patency of RA conduits and, thus, survival in men and women to be intriguing.

We are, thus, analyzing our clinical data to better define the relationship of age and sex on RA patency and survival after CABG using the RA as the second arterial graft. We again appreciate their interest in our work and their excellent suggestion for further investigation.

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<http://dx.doi.org/10.1016/j.jtcvs.2013.03.028>

Reply to the Editor:

We thank Tavlasoglu and colleagues¹ for their insightful comments in the February issue of the *Journal*. Our recently published article revealed that a small, hyperkinetic heart can be a risk factor for systolic anterior motion after mitral valve repair.² Although the underlying mechanism of this finding has not been determined, Tavlasoglu and colleagues¹ proposed that the mechanism may involve a morphologic aspect. We agree with this idea, because a small heart can be associated with closer proximity of mitral coaptation to the left ventricular outflow tract, which in an experimental study was demonstrated to contribute to the development of systolic anterior motion.³ In addition, they proposed that the small, hyperkinetic heart can