leaflet where the neochordae are inserted can be described by means of 2 Lagrangian parameters governing the deformation of the beam, which are the end-point angle $\theta_l$ and the force inclination $\alpha$ (Figure 1). As a matter of fact, the angle $\alpha$ is determined by the orientation of the chorda tendinea and depends on both the angle $\theta_l$ and the position of the papillary muscle. Other factors that require considerations are material constants, which can be modeled by the tensile Cauchy stress $\sigma$ and by Piola-Kirchhoff nominal stress and represent the edge load per unit reference cross-sectional area of the neochordae. Material constants are important, because the insertion of neochordae occur on degenerated leaflets and tissues that are composed of a different mechanical resistance than a normal leaflet.

In conclusion, we congratulate Yoshida and colleagues\(^2\) and Padala\(^1\) for their work. We believe that a model taking into account not only geometric but also biomechanical and functional dynamic parameters is of paramount importance to our exhaustive understanding of the issues relative to degenerative mitral disease.

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**References**


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they are thinner and move rapidly. However, evaluation of the mitral leaflets is possible in the midsystolic phase when there is minimum movement. In addition, evaluation of the papillary muscles using ECG-gated CT is more useful than echocardiographic evaluation because the number and size of the papillary muscles remain obscure on an echocardiogram.4

Although our study demonstrated precise and dynamic morphologies of the mitral leaflets and subvalvular apparatus, assessment of biomechanical characteristics of the mitral valve may become more important for understanding mitral valve disease and developing new surgical treatments. In particular, elucidation of differences in elastic behavior between degenerated and normal leaflets may become an important target of mitral valve repair. More elastic mitral leaflets in extensive degenerative regions may require intraoperative adjustment to correct the length of artificial chordae,5 even though the distance between the tips of the papillary muscles and the normal leaflets is precisely measured with our technique using 320-slice CT because of redundancy and the different elasticity of mitral valve tissue in degenerative regions (Figure 1). This redundancy and different elasticity may cause difficulty in accurate length assessment of artificial chordae.

We expect that the biomechanical assessment proposed by Nappi and colleagues1 will allow us to achieve more precise and individualized estimation of the length of artificial chordae in degenerative tissue with different elasticity.

Shohei Yoshida, MD
Koichi Toda, MD, PhD
Yoshiki Sawa, MD, PhD
Department of Cardiovascular Surgery
Osaka University Graduate School of Medicine
Osaka, Japan

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