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INVITED COMMENTARY

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Solving a bottleneck in animal models of peyronie's disease

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Peyronie's disease is characterized by the formation of a fibrous plaque in the tunica albuginea (TA) of the penis. It is a benign condition of unclear etiology, resulting in deformities such as curvature, indentation or shortening. The disease has been shown to be prevalent, especially in older men, and affects quality of life, principally through pain during erection, erectile dysfunction and associated psychological impact.

Medical treatment options are limited in number and efficacy for Peyronie's disease; leaving surgery as the only efficacious options for most patients. Development of novel therapeutic approaches is hampered by lack of reproducible, inexpensive and consistent animal models which mirror the clinical aspects of the disease, most importantly curvature formation and ossification. Previous models used injections of transforming growth factor-beta[1] or fibrin[2] and surgical trauma to TA;[3] however, neither significant curvature nor ossification was achieved. Repeated administration of transforming growth factor-beta is required to achieve significant curvature.[4] Tsk genetic mouse has achieved curvature and cartilage formation,[5] but is an expensive model and the fibrosis is not limited to TA.

In the manuscript 'Tunica albuginea allograft: a new model of LaPeyronie's disease with penile curvature and subtunical ossification' published on *Asian Journal of Andrology*, Ferretti *et al.*[6] demonstrated that allograft TA transplantation in rats can achieve both significant curvature and some signs of ossification. Importantly the authors performed experiments in a temporal fashion, investigating various parameters at different time points (1, 3, 7 and 12 weeks) after allografting. By doing so, they were able to show that TA allografting was able to cause curvature and elastic fiber loss as early as 1 week after the operation, while erectile dysfunction was observed only at 12th week. Curvature and elastic fiber loss was stable for 12 weeks. These results may suggest that the curvature can be simply due to disruption of normal morphology of the TA during tissue resection and grafting, not necessarily due to inflammatory processes triggered by the allograft. However, the authors' observation that '…when the grafted tunica was rejected from the corpus cavernosum, a new tunica appeared underneath the allograft. This new tunica, however, was rebuilt in an irregular fashion with disappearance of the two original layers organization (external longitudinal and internal circular). Cartilage-like areas were also seen in 30% of the cases with lacunae chambers and matrix material which fills space between lacunae' is extremely important as it suggests that ossification may be triggered in the newly formed TA in an inflammatory microenvironment. Obviously, further temporal analysis of this phenomenon (i.e., longer than 12 weeks) will be essential to understand how inflammation can lead to ossification in a disorganized TA tissue.

The perfect animal model of Peyronie's disease may not be here yet, but Ferretti *et al.* should be commended for their detailed temporal analysis and their very important observation which may lead to further basic science research as well as further development of this model.

COMPETING INTERESTS

The authors declare that they have no competing interests.

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