Peyronie's disease in contemporary urological practice

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The year 2013 marked a watershed in Peyronie's disease. In December of that year, the United States Food and Drug Administration (FDA) approved injectable clostridium Collagenase histolyticum (CCH), trade name Xiaflex[®] or Xiapex[®], for the treatment of men with Peyronie's disease. This special edition of the *World Journal of Urology* focuses exclusively on Peyronie's disease in a post-CCH world. What we discover is a field that is booming.

Patel et al. review the known inflammatory and fibrotic mediators of Peyronie's disease to provide insight into the pathophysiology of the condition [1]. While transforming growth factor- β (TGF- β) is predominantly implicated in fibrosis and plaque development, a number of other extracellular and intracellular mediators play a role.

Diagnosis of penile deformities largely depends on history and clinical examination in the outpatient encounter. However, quantitative techniques such as goniometry and duplex ultrasonography are useful adjuncts in curvature assessment. In this issue, Dean provides a useful review of penile ultrasound for the assessment of Peyronie's disease plaques and penile deformities [2].

Mills and Gelbard chronicle the evolution of CCH from an enzyme studied in the laboratory to the first pharmaceutical agent FDA-approved for treatment of Peyronie's disease [3]. Despite the success of CCH, it is not a panacea. The clinical trials upon which the FDA relied to approve CCH showed an improvement in penile curvature of about 35%. Identifying the men who are most likely to experience improvement with CCH is important for patient selection and counseling. Masterson et al. review characteristics predictive of response to CCH, such as degree of curvature, duration of disease, and erectile function, among others [4].

As intralesional CCH injection therapy is a destructive procedure, complications are a concern among clinicians. Such complications include bruising, swelling, hematoma formation, and corporal rupture, and the demand for a higher level of competence in injection technique and management of complications undoubtedly dissuades the casual practitioner from offering the treatment. Greear et al. review these complications and provide a framework for how to approach the patient presenting with a post-CCH complication [5]. Amighi et al. describe an alternative injection protocol, termed the "fan technique," which appears to reduce procedural morbidity, and the authors propose a hematoma classification system, which may simplify the effort to compare outcomes across clinicians and institutions [6].

The clinical trials documenting the efficacy of CCH excluded men who were experiencing the acute phase of Peyronie's disease. Despite the paucity of evidence in the literature, practitioners are performing intralesional injection of CCH for treatment of acute phase plaques. El-Khatib et al. provide a succinct review of the data to support this practice [7]. Indeed, the available data suggest that CCH injection is a promising modality for select patients with acute-phase Peyronie's disease, and further studies are no doubt on the horizon.

Even with CCH on the market, there is a role—indeed, arguably a larger role—for reconstructive surgery. There are men who simply are not candidates for intralesional therapy; men who do not achieve satisfactory curvature improvement with injections but are enfranchised into seeking alternative options; and men who decline injections in favor of surgical correction. Thankfully, surgical techniques and graft materials are improving, and the evidence for these is becoming stronger as outcomes are studied more robustly.

One group of men—those with congenital penile curvature (CPC) who develop new-onset worsening—are of particular interest, as the evolution of their condition is not entirely attributable to the pathogenesis of Peyronie's disease. Ziegelmann et al. share their experience with tunica albuginea plication (TAP) in men suffering from CPC with

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worsening curvature and show that TAP is an efficacious treatment option for these men [8].

Available graft materials for reconstructive surgery are often limited by a center's geographic location or contractual obligations. A newer option with excellent potential is collagen fleece, trade name TachoSil®, for which surgical technique and available evidence are reviewed by Hatzichristodoulou in this special issue [9].

The role of andrology in urology and men's health has risen to much higher prominence over the last 15 years. Part of this stems from an increased interest among trainees. In the United States alone, the number of post-residency training programs has tripled since 2010. The availability of targeted therapies for conditions such as erectile dysfunction, hypogonadism, infertility, and Peyronie's disease likely undergirds this enthusiasm. One cannot ignore the impact of commercialization on the field as well. Male sexual health clinics, many staffed by non-urologists, pepper the landscape. With very little science or medical acumen, these clinics treat low libido, erectile dysfunction, and Peyronie's disease with everything from pills and injections to "stem" cells, cord blood, plasma, and shock waves. While there may be a signal for some of these therapies, the science remains inconclusive. In the meantime, the conscientious andrologist will continue to rely on peer-reviewed studies to further the field. As the field subspecializes, the demand among patients for experts in treating their conditions, e.g., Peyronie's disease, will predominate.

The contributions to this special issue provide exceptional foundations and perspectives for the urologist seeking to treat men with Peyronie's disease. We invite you to read this special issue as you continue to advance the practice of andrology.

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