

Peyronie's Disease and Erectile Dysfunction: A New Perspective-What Every Urologist and Man Should Know About Peyronie's Disease

Commentary

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ABSTRACT

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Introduction: The relationship between erectile dysfunction (ED) and Peyronie's disease (PD) has not been well understood. A better understanding of this might lead to strategies to prevent this disorder.

Aim: To examine the relationship between ED and PD and develop strategies for the prevention of PD.

Methods: This review was based primarily on the author's 45 year experience in a subspecialty dealing with these two disorders. Selected references were cited to help support these views.

Main Outcomes Measures and Results: A synthesis of the author's experience was used to develop a better understanding of the relationship of ED to PD. A new term (erectile insufficiency) was proposed, and a new definition for safe sex was given. Strategies to prevent PD were developed.

Conclusion: ED is a significant factor in the development of PD. Using this knowledge patients can be educated on how to reduce the chance of developing this disorder.

Key Words: erectile dysfunction, Peyronie's disease, penile injury

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INTRODUCTION

The first part of this commentary might be subtitled: "What Every Urologist Should Know About Peyronie's Disease," and the second part might be subtitled: "What Every Man (and his Partner) Should Know About Peyronie's Disease."

This perspective is largely based on 45 years of experience in a urologic subspecialty (male genitourinary reconstruction) that includes men with erectile dysfunction and Peyronie's disease. In this commentary I will:

- Examine in a new way the relationship between erectile dysfunction (ED) and Peyronie's disease (PD).

- Define a new entity: erectile insufficiency (EI)

- Discuss management of PD providing a new update on the use of penile prostheses

- Provide a new definition for Safe Sex

- Discuss prevention of PD (new)

What Every Urologist Should Know About Peyronie's Disease

Peyronie's disease bears the name of Francois Gigot de la Peyronie, physician to King Louis XIV, who published "Some Obstacles Preventing the Normal Ejaculation of Semen" in 1743. This disorder was actually first reported by Fallopius in 1561^[1]. PD is characterized by:

- Presence of a penile plaque, nodule, or induration

- Penile curvature, shortening, or other deformity with erection

- Pain with erection (sometimes)

- Frequent association with ED

Although ED and PD have frequently been linked, it has not always been clear how often they are associated or which comes first. The following quote helps to explain this: "Elucidating the role preexisting ED plays in the development of PD remains a difficult task, as ED is also a known sequel of PD. What is unfortunately lacking in the literature is any detailed exploration of the timing of onset of ED and onset of PD, as only ED that precedes PD could confer a risk for PD development."^[2]

Is ED a binary condition (a man either has it or he does not)? Clearly not always. What is ED? For many years men with what is now known as ED were said to have impotence. In 1992 the National Institutes of Health (NIH) convened a consensus panel on impotence. The most significant outcome of this panel, which I was on, was the decision to rename impotence erectile dysfunction. Erectile dysfunction (ED) was defined as: "Consistent inability to attain or maintain an erection of the penis sufficient to permit *satisfactory* (my emphasis) sexual intercourse."^[3] Later we realized that something was lacking and we added: "on more than fifty percent of attempts." I will return shortly to the term satisfactory sexual intercourse.

ED can be sub divided into primary ED (present since first attempts of sex with a partner), and secondary ED (ED presenting after a well-established period of normal sexual function). Primary ED in many cases has psychogenic causes whereas secondary ED usually has underlying organic causes. Unless secondary ED occurs after trauma or pelvic surgery, it is preceded by a period of gradually diminishing erectile rigidity. We ask patients to grade their erectile rigidity on a scale of 0 to 10.

Penile rigidity of 6 or 7/ 10 may be sufficient for penetrative sex thus not rising to the definition of ED; however, during coitus rigidity is not always maintained and it can vary according to fatigue, stress, or alcohol intake. As ED develops, penile rigidity gradually decreases leading to excessive bending during penetrative sex and often silent delaminating injuries to the elastic covering (tunica albuginea) of the erectile chambers (corpora cavernosa). The scar that forms as these injuries heal is known as plaque, and it causes the penile shortening and erectile deformity known as PD^[4].

I would suggest that we call the prodromal phase of gradually decreasing erectile rigidity leading up to ED erectile insufficiency (EI). Satisfactory intercourse in the NIH definition should also mean intercourse that does not cause penile bending and injuries resulting in PD. Safe sex, which has meant sex not leading to sexually transmitted disease, should also now mean sex not leading to penile injuries.

This concept that PD results from bending injuries to the penis during penetrative sex can be better understood by comparing PD to penile fracture (Table 1). Large forces are required for penile damage during coitus in young men because their erectile rigidity is normal (10/ 10). The injury is dramatic, and when we repair these injuries we find a tear in the tunica albuginea usually at the base of the penis. Following penile fracture repair erections are usually straight. If penile fracture is not repaired, a scar forms at the site of the injury and erections may curve to the side of this scar.

In older men whose erectile rigidity has declined, penetrative sex is possible but bending of the penis during thrusting can produce delaminating injuries to the tunica albuginea which, because the forces are less, are often silent. These injuries typically occur more distally. The scar (plaque) that forms during healing is usually palpable and causes erectile deformity (PD). One injury is often enough to lead to PD, but in other patients recurrent injuries occur.

The reported prevalence of PD varies considerably, but the best evidence in this regard in my opinion is from a multicenter study of 534 men ranging in age from 40 to 75 who presented for prostate cancer screening. They filled out a Sexual Health Inventory for Men (SHIM) and underwent penile exam by a sexual health urologist. A penile nodule was noted in 48 (8.9%). The presence of a nodule was significantly related to age (68.2 v 61.8 years, $p < 0.0001$), hypertension $p < 0.02$, diabetes mellitus $p < 0.007$, and the presence of ED as noted by a low SHIM score^[5].

In the early phase of PD while healing is taking place, erections are painful in some patients. This pain with erection is probably caused by inflammation associated with the injury, and when healing is complete, the pain almost always disappears.

Before this injury model for PD was understood, many medical therapies for PD were employed (Table 2). Most were not helpful although many were credited for relieving erectile pain; pain, however, usually disappears without treatment. There is one FDA approved treatment for PD: plaque injections with collagenase clostridium histolyticum^[6]. Collagenase breaks down scar and this treatment is used primarily for men with dorsal penile curvature due to dorsal plaques. The mean improvement in curvature was 34%. Collagenase injections are contraindicated in men with ventral plaques. This treatment does not address the issues of EI or ED which are often present in men with PD.

Surgical therapies for PD are shown in Table 3. In men with good erectile rigidity, curvature with erection can be corrected by tunica albuginea plication of the penis (TAP). Many regard this as a procedure which shortens the penis. In my opinion this is a misconception. It is the scar that forms in PD which shortens the penis. TAP shortens the

normal side of the penis to match the shortening already present due to scar on the opposite side. The length of the erection following this procedure is approximately equal to the stretched penile length at beginning of the procedure. I have found little risk of worsening ED or EI following TAP.

Grafting procedures either incise or excise the plaque and place a graft in the resulting defect. This straightens the penis and restores some of the lost penile length. The downside to this procedure is possible worsening of erectile function^[7].

EI or ED is usually a predisposing factor in men with PD. If surgical straightening is performed (TAP or graft) and nothing is done to improve erections, then repeat injury to the penis may occur leading to recurrent PD, more erectile deformity, and further penile shortening. For a man with PD to be able to have safe sex, he needs a straight penis with firm erections that will not lose rigidity during coitus. For this reason I am recommending inflatable penile prosthesis (IPP) implantation to more of my PD patients. The operative indication for this is organic ED (or EI); PD alone is not an acceptable indication for penile prosthesis implantation. If a Coloplast device (Coloplast Corporation, Minneapolis, MN) is used, any of the cylinders are acceptable. If an AMS device (American Medical Systems, Boston Scientific, Minnetonka, MN) is used, CX or CXR cylinders rather than length expanding LGX cylinders should be used^[8]. Inflation of either of these prostheses corrects most of the erectile deformity, and bending (modeling) the penis while the cylinders are inflated corrects the rest^[9]. A concomitant straightening procedure in my experience is almost never needed.

What Every Man (and his Partner) Should Know About Peyronie's Disease

Can PD be prevented? Not absolutely but the risk can certainly be reduced. Oral medications (PDE5 inhibitors) for ED (sildenafil tadalafil, vardenafil, etc.) are generally not used until ED is present. Using them earlier when EI begins will reduce risk. Life style modifications and correcting co-existing androgen insufficiency may also be helpful. These and other safety measures are listed in Table 4, An Owner's Manual for the Penis – a Guide to Safe Sex.

DISCLAIMER

As stated at the beginning of the commentary, these views are based primarily on my 45 years of experience. In some cases they differ from the views expressed in the AUA Guideline on Peyronie's Disease^[10]. It should be noted that the quality of evidence for Peyronie's disease is not good. In these AUA guidelines there are 19 treatment recommendations. Five of these recommendations are based on clinical principle and 2 are based on expert opinion. For the other treatment recommendations based on evidence (ranging from A to C), there were 3 treatment recommendations based on level B evidence (moderate quality evidence and moderate certainty) and 9 based on level C evidence (low quality evidence and low certainty).

SUMMARY

- Erectile Dysfunction (ED) is usually preceded by Erectile Insufficiency (EI)
- Peyronie's disease can mostly be due to a buckling injury associated with EI or ED
- Peyronie's disease in midlife is common (9%)
- Medical therapy for Peyronie's disease is usually ineffective
- Surgery (TAP, graft, or IPP) is indicated if coitus is difficult or impossible
- Surgical procedures should be tailored to the patient's need
- Erections should be straight and rigid enough to prevent further injuries
- To prevent further injuries employ IPP implantation more often when medical therapy fails to correct EI or ED
- Peyronie's disease maybe preventable by controlling risk factors for ED and employing Owner's Manual Guidelines for the Penis

Table 1: Peyronie's Disease – Penile Fracture

	Penile Fracture	Peyronie's disease
Age	Young	Middle age
Rigidity	10/10	6/10
Force	Great	Less
Injury	Dramatic	Subtle
Location	Often at base	Usually more distal

Table 2: Some Medical Therapies for Peyronie's Disease

Vitamin E	Topical
POTABA	Iontophoresis
Colchicine	Radiation
Plaque injections*	ESWL
*steroids, interferon, verapamil, colostridial collagenase (Xiaflex)5	

Table 3: Surgical Therapy for Peyronie's Disease

Good Erections	Erectile Insufficiency or Dysfunction and/or Severe Deformity
Tunica albuginea plication (TAP)	Inflatable penile prosthesis implantation
Plaque incision plus graft	
Plaque excision plus graft	

Table 4: An Owner's Manual for the Penis – A Guide to Safe Sex

Early use of a type 5 phosphodiesterase inhibitor
Life style modifications, correcting androgen insufficiency if present
Adequate natural lubrication or use a lubricant
Man or partner's use of hand to guide intromission
Avoid partner-on-top position
Straight thrusting OK; avoid bending penis during thrusting
Avoid sex when fatigue or too much alcohol is present

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