Peyronie's disease

Synonyms: penile fibrosis, induratio penis plastica

What is Peyronie's disease?

This a disorder of penile connective tissue, first brought to widespread medical attention by François Gigot de la Peyronie in 1743, although described in the medical literature back to the 13th century.[1] Fibrous plaque formation occurs in the corpus cavernosum's tunica albuginea. There is inflammatory thickening with fibrin deposition, increased collagen production, decreased quantity of elastic fibres and subsequent fibrosis ± calcification. This leads to penile angulation or an hourglass-like deformity with distal flaccidity. It usually affects only the erect penis. Sexual intercourse can become painfully difficult or impossible. It is thought to occur (but nobody really knows) as a result of one-off or repeated penile vascular trauma causing leakage and immunological reaction in the relatively avascular tunica albuginea. Genetic susceptibility is thought to play a role.[2] Studies suggest a link with low testosterone levels.[3] A congenital form has also been described.

How common is Peyronie's disease? (Epidemiology)

Exact figures for prevalence and incidence are hard to come by as, due to embarrassment, many men may not seek help. Various figures are mentioned in the literature, including a prevalence of 3-9% in studies which are now nearly 20 years old,[4] , and a more recent figure from a 2016 review which suggests that in America the prevalence of definitive and probable cases are 0.7% and 11-13% respectively. [5]

One study reported a subset of patients presenting in adolescence. These tended to have a higher number of plaques and an increased incidence of raised HbA1c levels.[6]

Associated conditions

Purportedly, Dupuytren's contracture, diabetes mellitus, hypertension, lipid abnormalities, ischaemic cardiopathy, erectile dysfunction, smoking and excessive consumption of alcohol. However, the pathophysiology remains unclear. [7]

Peyronie's disease symptoms and presentation

When Peyronie's disease (PD) first presents, most commonly in the 50s [1] , it tends to be with penile pain during erections, penile angulation (this can be seen in some cases in a flaccid penis), palpable fibrous plaque at the site of angulation and erectile dysfunction. This inflammatory phase settles in 18-24 months, to be followed by a fibrotic phase characterised by plaque formation, angulation and calcification. One study, using a validated mental health questionnaire, has shown that 48% of men with PD have mild or moderate depression. [1]

By Peyronie, via Wikimedia Commons

Physical examination should include measuring the penis dorsally from base to the tip of the glans. Plaque size and angulation should be measured while the penis is erect. Angulation can be measured by means of a photograph taken at home, a vacuum pump or by intra-cavernosal injection of a vasoactive agent. Changes in girth are often self-reported by the patient. The hands should be examined for evidence of Dupuytren's contracture.In recent years it has been more common for patients to send us photos via text message or email. However, advice should be sought from your medical defence union before asking for photographs of genitals to be sent - the use of photos is probably best left to the specialist. [8]

There are validated assessment tools to measure erectile dysfunction, such as the International Index of Erectile Function (IIEF).

Investigations

- Prevailing guidelines do not recommend ultrasonography in routine clinical practice, as this has been found to be inaccurate and operator-dependent. However, a specialist may use ultrasonography after intracavernosal injection to determine the type and degree of deformity.[1]
- Duplex ultrasonography is occasionally used to detect associated vascular abnormalities.[9]
- Given the association with cardiovascular disease, it would be sensible to check for risk factors such as diabetes, hypercholesterolaemia and hypertension, if this has not been done recently.

Peyronie's disease treatment and management

Studies of the natural history of the disease suggest that it is a self-limiting condition which goes through an active, scarring phase followed by a mature quiescent phase. This makes the interpretation of pharmaceutical trials difficult to interpret unless there is a control group and strict double-blinding. Most pharmacotherapy reduces scarring and is therefore most effective during the active phase. Before embarking on intra-lesional or surgical approaches, several months should therefore be allowed to pass to allow resolution to occur. The role of conservative therapy is controversial and evidence-based guidelines are needed. Whilst there is no gold standard approach, many professionals in the field find that a combined approach, using oral therapy, intralesional treatments and minimally invasive surgical techniques is the best approach for patients with mild-to-moderate symptoms requiring treatment.

Psychosexual difficulties are an unsurprising byproduct of the condition and referral to a psychologist/counsellor/psychiatrist skilled in this area may significantly reduce the burden of the disease on the patient.

Non-drug

- External penile traction is a new technique that is currently being evaluated. Initial data seem promising in terms of improving penile length and reducing deformity.[10]
- Vacuum devices act in a similar manner.

Drugs

- **Oral**: there are various drugs which have been tried but few have shown any consistent effect in placebo-controlled trials, and prevailing European guidelines no longer recommend the use of vitamin E, tamoxifen, acetyl-L-carnitine or pentoxifylline. A 2015 review actively recommended against the use of procarbazine, tamoxifen and potassium paraamniobenzoate, although the latter is the only therapy which is licensed in the UK and appears in the BNF.
- **Topical**: verapamil has been reported to have some success in improving penile curvature and plaque size after prolonged use (nine months) but evidence that it penetrates into the deeper layers of the tunica albuginea is lacking.
- **Intralesional**: several agents have been tried, including verapamil, interferon and clostridial collagenase. None has a particularly strong evidence base but studies have reported some improvement in such parameters as pain, plaque size and angle of deviation. In the USA, the FDA approved clostridial collagenase as a treatment in 2013. Steroids are now thought best avoided, as there is evidence that they can increase inflammation.
- **Iontophoresis - electromotive drug administration (EMDA)**: various researchers have used electrical current (up to 5 mA) to deliver charged drug molecules to the affected area - usually a combination of dexamethasone, verapamil and/or orgotein and lidocaine. The evidence base supporting the effectiveness of this method is equivocal. There appear to be no significant adverse effects apart from mild, local erythema.

Surgical

Careful selection, patient education and discussion of patient expectation help to improve satisfaction post-surgery. Issues to be discussed should include the aims and risks of surgery, the risks of penile shortening, the risk of recurrent curvature, the possibility of knots and stitches being palpable beneath the skin and the possibility that circumcision may need to be performed at the time of surgery (to prevent postoperative phimosis). Surgery should not be attempted until the disease has been stable for at least three months (some authorities recommend this period should be 6-12 months). Various techniques are available:

- **Extracorporeal shock wave therapy**: the National Institute for Health and Care Excellence (NICE) has produced guidance for professionals and public on the use of this technique in this context. Essentially, whilst there are no significant safety concerns, NICE is not convinced of any proof of efficacy for the procedure; it advises it be used in carefully controlled, well-audited programmes or as part of a research trial, with detailed explanation given to patients during the consenting process. The guidance was published in 2003 but remains current in 2022.[11]

- **'Cold steel' surgery**: this surgery should be reserved for patients with significant morbidity who fail to respond to medical therapy. It should be deferred until 12-18 months, after which time changes to plaques and angulation are unlikely. Surgery is the only evidence-based treatment that has shown any effectiveness in the congenital form: it can be performed at any time in adulthood. Options include:
    - The Nesbit tuck procedure: normal tunica albuginea is removed from the side of the penile shaft opposite the plaque to straighten and shorten the penis. Potency should be normal and the penile curvature should be less than 60°.
    - Tunica plication procedure: this involved plication rather than excision of the unaffected tunica albuginea to straighten the penis. This technique also causes penile shortening.
    - Plaque excision and grafting: this is performed to preserve penile length when the curvature is greater than 60°.
    - Plaque excision and penile prosthesis insertion: this is useful when severe erectile dysfunction is also a problem.
    - One study described a new technique using a new lengthening surgical procedure based on a ventro-dorsal incision of the tunica albuginea, penile prosthesis implantation and double dorsal-ventral patch grafting with porcine small intestinal submucosa.[12]
    - Carbon dioxide laser: this has been used to good effect in some cases to thin the plaque.

Prognosis

PD rarely resolves completely. Studies suggest that without treatment, 13% of patients have a diminution or complete resolution of pain with time. One half of the remainder has progressive disease; the other half has static disease. Persisting symptoms may vary from static painless plaque to painful erections with curvature significant enough to prevent intercourse. Because evidence of the effectiveness of treatments from large-scale trials is lacking, the effect of the various therapies on prognosis is unknown.

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