

Brief Research Report

Treatment of patients referred with Peyronie's disease

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ABSTRACT

INTRODUCTION. Peyronie's disease (PD) is a benign penile disorder characterised by fibrotic plaques, leading to curvature and potential sexual dysfunction. It often coexists with diabetes, erectile dysfunction and cardiovascular disease. In Denmark, patients are referred by general practitioners (GPs) to public or private hospitals under a treatment guarantee ensuring care within 30 days.

METHODS. We conducted a retrospective study of PD patients referred by GPs to Aarhus University Hospital in 2019. Data were retrieved from the Central Denmark Region Business Intelligence Portal. Patient characteristics, plaque location, treatment strategies and surgical outcomes were analysed using REDCap and Excel.

RESULTS. Among 124 referred cases, 101 met the inclusion criteria. After evaluation by a urology specialist, 44 (43.5%) were referred for surgical treatment; 29 (28.7%) were managed surgically in the public sector. Bilateral plaques were more often treated conservatively. Only 14.8% were referred for private sector treatment.

CONCLUSIONS. GPs effectively triage PD cases for specialist care. Most patients were treated within the public sector despite capacity constraints. While the treatment guarantee may challenge healthcare sustainability, current referral patterns remain balanced.

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TRIAL REGISTRATION. Not applicable. The study received approval from the relevant local authorities.

Peyronie's disease (PD) is an inflammatory disorder of the penis characterised by fibrotic plaque formation within the tunica albuginea. Plaque formation may lead to penile curvature, pain during erection and, in severe cases, difficulty with penetrative intercourse. Previous studies report prevalence rates ranging from 0.4% to 20.3% [1-5], with the highest rates observed among men with diabetes and erectile dysfunction [3]. Other risk factors include hypertension, dyslipidemia, ischaemic heart disease, autoimmune disorders, smoking and excessive alcohol use [6-12]. Stigma and embarrassment likely contribute to underreporting [3].

The precise aetiology of plaque formation remains uncertain, though repetitive micro-trauma followed by abnormal wound healing may be involved [6].

Two clinical phases may be recognised in PD: an initial acute inflammatory phase and a later chronic phase characterised by fibrosis. Pain is common during the active phase but tends to resolve in about 90% of patients over time. Penile curvature progresses in up to 48% of cases, remains stable in 36-67% and spontaneously improves in only 3-13% [2].

Management strategies for PD may be divided into conservative non-surgical and surgical approaches.

Conservative options, often preferred during the acute phase, aim to control pain and prevent disease progression. Various methods with varying evidence base include oral pharmacotherapy, intralesional

injections, shockwave therapy and topical treatments [13-15]. Surgical intervention is reserved for stable disease associated with notable deformity, which makes penetrative intercourse impossible.

The Danish healthcare system offers free hospital treatment based on universal access funded by general taxation. Patients typically access treatment for PD through general practitioners (GPs), who serve as gatekeepers. The current treatment guarantee ensures that patients receive a work-up at the hospital within 30 days after referral from their GP [16]. If the patient is offered care at the public hospital after the guaranteed timeframe, he may choose either to wait or to opt for treatment at a private hospital, with the public system covering the costs.

The focus of this analysis was the evaluation of the strategy chosen for patients with PD referred from general practice. How often was surgical treatment offered in a public and in a private setting after further referral?

Methods

For this retrospective study, we included patients with PD who were referred by their GP to the Department of Urology at Aarhus University Hospital, Denmark, from 1 January to 31 December 2019. Data on patient characteristics, postoperative outcomes (**Table 1**), plaque placement, management (**Figure 1**) and risk factors ([Supplementary material](#)) were extracted from patient charts after defining the cohort via the Central Danish Region Business Intelligence portal (BI-portal), within the hospital's catchment area of 800,000 residents. We collected data for the International Classification of Diseases, tenth version (ICD-10) diagnostic codes DN486 (Induratio penis plastica peyroni) and DQ544 (Penis arquatus).

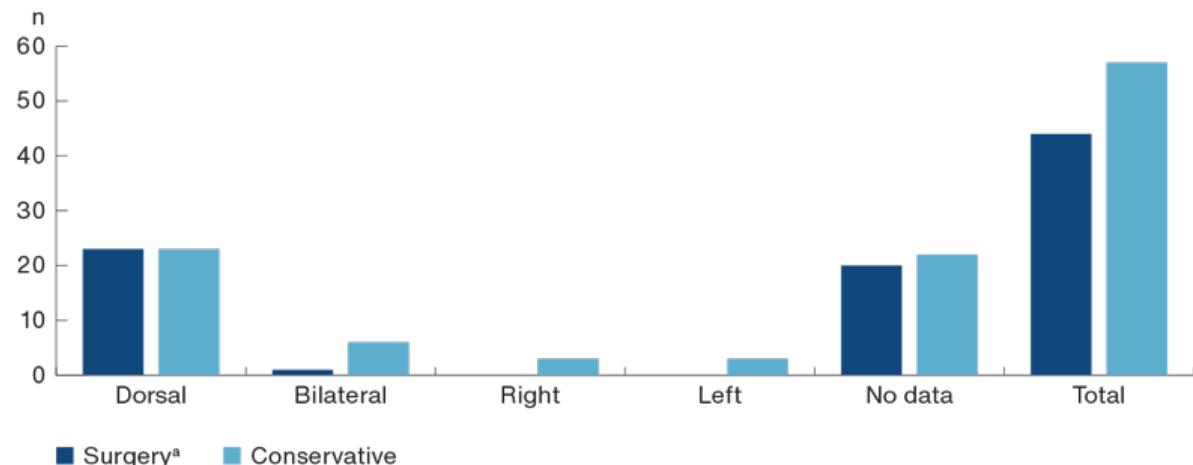
TABLE 1 Patient characteristics and post-operative follow-up relevant for operations performed at Aarhus University Hospital. Data were collected during the initial outpatient consultation. Of the 26 patients who underwent surgery, five (19.3%) experienced complications.

Patients, N (%)	101 (100)
Age at diagnosis, median (range), yrs	56.61 (29.1-75.66)
<i>Patient height</i>	
Median (range), m	1.81 (1.55-2.08)
No data, n (%)	21 (20.8)
<i>Patient weight</i>	
Median (range), kg	85 (64-147)
No data, n (%)	21 (20.8)
<i>BMI</i>	
Median (range), kg/m ²	26.45 (17.9-40.5)
No data, n (%)	21 (20.8)
<i>Alcohol use, n (%)</i>	
≤ 14 U/wk	64 (63.4)
> 14 U/wk	13 (12.9)
No data	24 (23.8)
<i>Smoking, n (%)</i>	
No smoking	19 (18.8)
< 10 cigarettes/day	40 (39.6)
10-20 cigarettes/day	14 (13.9)
20-30 cigarettes/day	4 (4)
≥ 40 cigarettes/day	2 (2)
Former smoker	0
No data	22 (21.8)
<i>Diabetes mellitus, n (%)</i>	
Type I	3 (3)
Type II	8 (7.9)
None ^a	90 (89.1)
No data	0
<i>Surgery and complication</i>	
Patients who underwent surgery, n (%)	26 (25.7)
Of the 26 surgical patients, n (% ^b):	
Infection: Clavien Dindo 2	2 (7.6)
Bleeding: Clavien Dindo 1 + 2	0
Bleeding: Clavien Dindo 3	0
None	21 (80.7)
Paraphimosis	3 (11.5)

a) No diabetes mentioned in the medical record, in the archive or no antidiabetic medicine found in the medical list.

b) %: n/26.

FIGURE 1 A total of 58 (57.4%) patients with palpable plaques were registered. An OR of 12 indicates a 12-fold increase in the likelihood of requiring surgery when the plaque is located dorsally, as opposed to bilaterally, on the left or the right side.



a) Surgery: defined as those who are rereferred to private hospital unit, operated at the university hospital or potentially are waiting for surgery ($N_{surg} = 44$).

We used REDCap for data management and present data as percentages, medians, ranges and OR calculated with Microsoft Excel. Between-group differences were tested by Fisher's exact test.

Trial registration: not applicable. The study received approval from the relevant local authorities.

Results

Of 124 initial cases, 23 were excluded due to duplicate records or a diagnosis other than PD, leaving 101 patients (see Table 1).

After urology specialist evaluation of the 101 patients referred for PD to the university hospital in 2019, 44 patients (43.5%) were ultimately offered a surgical management strategy, either publicly (n = 29 (26 operated, three on waiting list)) or privately (n = 15) ([See Supplementary Figure 1 for a flow chart presenting the evaluation and management strategy](#)).

The most performed surgical procedure was the Nesbit technique, involving plication on the convex side of the curvature [17]. While effective at straightening the penis, it frequently results in penile shortening, and patients were informed accordingly and consented.

Five (19%) out of 26 patients undergoing surgery in a public setting for PD experienced minor complications.

There was a trend that bilateral plaque locations were more often managed conservatively (six out of seven patients) than dorsally located plaques (23 out of 46 patients), $p = 0.11$.

Figure 1 provides plaque placement information.

Discussion

This study provided insight into the management strategies for PD within a public hospital setting in Denmark. Minor complications were observed retrospectively in five (19%) of 26 patients undergoing surgical correction for PD. In more superficial penile surgery, like therapeutic circumcision, the reported complication rates are lower at 7.5% [18].

Interestingly, we observed a trend that bilateral plaque locations were more often managed conservatively.

Despite the benign nature of PD, in Denmark, the work-up and treatment guarantee obligate public funding for private sector interventions if a urological specialist deems surgery necessary. This could have important health-economic implications. One might raise the concern that benign but bothersome conditions, such as PD, could threaten public healthcare budgets if private referrals increase due to guarantees with shorter time periods or shifts in priorities.

However, our finding that only 14.8% were referred to private surgery suggests that most PD treatment remains within the public sector.

This study has several limitations due to its retrospective design and incomplete data from patients with milder disease who were managed conservatively. The potential underrepresentation of patients who were referred directly for private treatment from the GP and treated entirely within the private sector also biases findings. Nevertheless, we present consecutive patients in real-world settings. Our data reflects everyday clinical practice.

Conclusions

This study offers insight into PD management at a university hospital. 44% of PD patients were ultimately offered surgical management, either publicly or in the private sector. As benign yet impactful conditions like PD become increasingly covered by public health guarantees, careful resource allocation and healthcare planning will be essential to preserve equity and quality of care.

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