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ORIGINAL PAPER

Selective dorsal cryoablation *versus* glans penis augmentation with hyaluronic acid for medically refractory premature ejaculation: A 12-month retrospective comparative study

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Summary ***Objective: Selective dorsal cryoablation (SDC) and glans penis augmentation with hyaluronic acid (GPA-HA) are used for medically refractory premature ejaculation (PE), but have not been directly compared. We compared their efficacy and safety over 12 months. Materials and methods: We retrospectively analysed 189 men treated with SDC (n = 71) or GPA-HA (n = 118). Intravaginal ejaculation latency time (IELT), Premature Ejaculation Diagnostic Tool (PEDT), IIEF-5 and Clinical Global Impression of Change (CGIC) were assessed at months 1, 6 and 12, and glans vibratory perception threshold (VPTT) at baseline and month 12. The primary endpoint was a ≥ 2.5-fold IELT increase at month 12. Adjusted and sensitivity analyses were performed. Results: Twenty-four patients (12.7%) were lost to follow-up. SDC patients were younger with shorter baseline IELT. Both procedures increased IELT at all visits (p < 0.001), declining after month 1. Absolute IELT did not differ between the groups, but treatment success was higher with SDC (79.4% vs 63.7%, p = 0.034; adjusted OR 2.18, 95% CI 0.97-4.86). SDC yielded lower PEDT scores (median 7 vs 9, p = 0.002), a higher CGIC response at month 12 (84.7% vs 69.3%, p = 0.030) and a greater VPTT increase (2.5 vs 0.5 V, p < 0.001). Glans hypoesthesia occurred only after SDC (15.5%, p < 0.001).***
Conclusions: SDC provides a greater relative IELT improvement and better patient-reported outcomes than GPA-HA, at the cost of more frequent glans hypoesthesia. Erectile function was preserved with both procedures. Prospective randomised studies are needed.

KEY WORDS: Premature ejaculation; Cryoablation; Hyaluronic acid; Glans penis augmentation; Dorsal penile nerve.

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INTRODUCTION

Premature ejaculation (PE) is characterised by recurrent and continuous ejaculation occurring with minimal sexual stimulation before or shortly after vaginal penetration and resulting in reduced control over ejaculation, sexual dissatisfaction and personal stress (1). PE is regarded as one of the most common male sexual dysfunctions, affecting approximately 23% of men (2). Topical anaesthetic agents and oral medications, including *selective serotonin reuptake inhibitors* (SSRIs), tramadol and alpha-adrenergic blockers, are currently available (3). However, numerous patients require procedural treatment options, such as *selective dorsal cryoablation* (SDC) and *glans penis augmentation with hyaluronic acid* (GPA-HA), due to non-compliance with or failure of these medications.

SDC and GPA-HA aim to decrease sexual arousability and the overexcitable ejaculatory reflex, and reduce hypersensitivity, which are hypothesised to be the main factors in PE. However, while GPA-HA forms a mechanical barrier at the peripheral receptor level and anatomically protects the nerve, SDC directly interrupts transmission in the nerve trunk (4). Prologo et al. performed dorsal nerve cryoablation in 24 patients and reported that pretreatment *intravaginal ejaculation latency time* (IELT) increased from 54.7 s to 256 s on the 7th day and 182.5 s at the 3rd month (5). In a different study, *Abdallah and colleagues* used GPA-HA in 60 patients with PE, and IELT increased from 2.12 min at baseline to 7.71 min (6). Recently, *Başağa et al.* reported an approximately fourfold increase in IELT and a doubling of penile vibratory perception thresholds 12 months after SDC in 108 men with lifelong PE (7).

Although a limited number of studies analysed the efficacy and safety of SDC and GPA-HA, to our knowledge, no study has compared the two procedures in patients with PE resistant to conservative treatment. We therefore conducted this study to compare the efficacy and safety of SDC and GPA-HA for the management of medical treatment-resistant PE, and to analyse the stability of both treatments over 12 months.

MATERIAL AND METHODS

Study design and patients

The present study was conducted in a retrospective manner, and patients who were treated with SDC or GPA-HA

for PE between January 2022 and June 2025 were analysed for inclusion. The study was approved by the local ethics committee and conducted in accordance with the Declaration of Helsinki. Indications for SDC or GPA-HA were being between 18 and 65 years of age, a diagnosis of primary (lifelong) or secondary (acquired) PE according to the *International Society for Sexual Medicine* (ISSM) criteria, regular heterosexual intercourse with the same partner for at least 6 months, and intolerance and/or inadequate response to topical anaesthetic agents or oral medications. Erectile function was assessed with the *International Index of Erectile Function* (IIEF-5), and men with mild or mild-to-moderate erectile dysfunction (IIEF-5 ≥ 12) were not excluded. Patients with previous penile surgery (excluding circumcision), penile deformity, active genital infection, psychiatric disorder, neurological disease, anti-depressant use at the time of the procedure or active malignancy were excluded; previous use of SSRIs for PE was not an exclusion criterion. Patients who did not attend the 12-month visit were reported as lost to follow-up. Some of the SDC patients with lifelong PE were also included in a previously published single-arm study with 24-month follow-up, which addressed a different research question (8).

Detailed information about PE, alternative treatment modalities, success and possible complications of SDC and GPA-HA, and follow-up procedures was given to each patient, and written informed consent was obtained before each procedure. All procedures were performed by a single andrologist. Selection of the procedure depended on the joint decision of the doctor and the patient.

The CRYO-S Painless system (*Metrum CryoFlex, Lomianki, Poland*) was used for the SDC procedure. Under local anaesthesia, the probe was placed near the dorsal vasculature, along the designated dorsal penile nerve branches. Then, a two-stage freeze-thaw-freeze protocol was applied: the nerve tissue was frozen for two minutes at a target temperature of -78 °C, then thawed for one minute (two cycles).

GPA-HA linear injection technique

A total of 2 mL of 20 mg/mL cross-linked *hyaluronic acid* (HA) was used. A 27-gauge needle was inserted at the level of the coronal sulcus, targeting the subepithelial (superficial dermal) plane, and advanced toward the glans apex, stopping approximately 5 mm proximal to the urethral meatus (primarily the dorsal and lateral quadrants). During slow retrograde withdrawal of the needle, HA was delivered in a continuous linear fashion.

Follow-up and outcomes

Patients were evaluated at month 1, month 6 and month 12. IELT was measured with a stopwatch by the patient or partner, and the typical IELT of the preceding 4 weeks was recorded. The primary endpoint was treatment success at month 12, defined as an IELT increase of at least 2.5 times compared with baseline. Secondary endpoints were response on the *Clinical Global Impression of Change* (CGIC; scored from -3 to +3), defined as "*better (+2)*" or "*much better (+3)*" (9); the change in *Premature Ejaculation Diagnostic Tool* (PEDT) scores, with a month-12 score < 11 accepted as PEDT response; and maintenance of erectile function, defined as an IIEF-5 decrease of ≤ 3 points at month 12. Glans *vibratory perception threshold* (VPTT) was measured with a biothesiometer (*Biothesiometer X2, Kilde Medic, Græsted, Denmark*) at baseline and month 12. The Digital Biothesiometer X2 applies a defined 100 Hz vibration and reports the perception threshold in volts from 0 to 50 V.

Mid-glans circumference increase was measured at month 1 in the GPA-HA group. Complications occurring within 12 months were recorded. The definition, method of measurement, calculation and reference values of each outcome measure are summarised in Table 1.

Statistical analysis

Statistical analyses were performed using IBM SPSS Statistics for Windows, version 27.0 (*IBM Corp., Armonk, NY, USA*). Normality was assessed with the Shapiro-Wilk test. Normally distributed variables are presented as mean ± *standard deviation* (SD) and were compared with the independent-samples t-test; non-normally distributed variables are expressed as median (*interquartile range* (IQR)) and were compared with the Mann-Whitney U test. Categorical variables were compared with the chi-square test or Fisher's exact test (expected cell count < 5). Within-group changes were analysed in patients with complete measurements using the Friedman test, followed by Bonferroni-corrected Wilcoxon signed-rank tests. Because baseline IELT differed between groups, follow-up IELT was additionally compared using a linear mixed-effects model.

This model uses all available IELT measurements of each patient (months 1, 6 and 12), taking into account that repeated measurements from the same patient are correlated, and adjusting the comparison for baseline IELT. IELT was log-transformed because its distribution was right-skewed. The model was: $\log(\text{IELT}) = \beta0 + \beta1 \times \text{group} + \beta2 \times \text{visit} + \beta3 \times (\text{group} \times \text{visit}) + \beta4 \times \log(\text{baseline IELT}) + u + \varepsilon$, where group is SDC or GPA-HA; visit is month 1, 6 or 12; the group × visit term tests whether the difference between the groups changes over time; the baseline log-IELT term corrects for the baseline imbalance; u is a random intercept for each patient, representing his individual IELT level; and ε is the residual error. Back-transformation of the group coefficient gives the ratio of geometric mean IELT between the groups (SDC/GPA-HA): a ratio of 1 indicates no difference, and a ratio of 1.23, for example, indicates a 23% longer IELT with SDC after adjustment for baseline IELT.

The primary endpoint was analysed in patients who completed the month-12 assessment, and a multivariable logistic regression model adjusted for age, lifelong PE, baseline log-IELT, previous SSRI use and baseline PEDT was constructed. Sensitivity analyses comprised a worst-case analysis, in which patients lost to follow-up were classified as failures, and an inverse probability weighted analysis based on a model of follow-up completion. A two-sided P value < 0.05 was considered statistically significant.

Results

A total of 189 patients underwent SDC (n = 71) or GPA-HA (n = 118). The 12-month assessment was completed

Table 1.
Definition, measurement, calculation and reference values of the outcome measures.

Outcome	Definition and measurement	Calculation/outcome definition used in this study	Reference values
IELT	Time from vaginal penetration to intravaginal ejaculation, measured with a stopwatch by the patient or partner; the typical value of the preceding 4 weeks was recorded (s). Assessed at baseline and months 1, 6 and 12.	Fold increase = month-12 IELT/baseline IELT. Primary endpoint (treatment success): fold increase ≥ 2.5.	Lifelong PE: ejaculation always or nearly always within about 1 min; acquired PE: clinically significant reduction to about 3 min or less (1). Population median: 5.4 min (11).
PEDT	Validated five-item questionnaire assessing ejaculatory control, frequency, minimal stimulation, distress and interpersonal difficulty; each item scored 0-4 (12). Assessed at baseline and months 1, 6 and 12.	Total score 0-20 (higher = more severe). PEDT response: month-12 score < 11.	≤ 8: PE unlikely; 9-10: probable PE; ≥ 11: PE likely (12).
CGIC	Single question answered by the patient: "Compared with before treatment, how would you describe your premature ejaculation now?" (9). Assessed at months 1, 6 and 12.	7-point scale from -3 (much worse) through 0 (no change) to +3 (much better). Response: +2 (better) or +3 (much better).	Not applicable (change scale).
IIEF-5	Validated five-item questionnaire on erectile function; each item scored 1-5. Assessed at baseline and months 1, 6 and 12.	Total score 5-25 (higher = better). Erectile safety: decrease of ≤ 3 points from baseline to month 12.	22-25: no ED; 17-21: mild; 12-16: mild-to-moderate; 8-11: moderate; 5-7: severe ED.
Glans VPTT	Lowest vibration intensity perceived at the glans, measured with a biothesiometer (Biothesiometer X2, Kilde Medic, Græsted, Denmark; 100 Hz). The probe was placed on the dorsal midline of the glans, midway between the urethral meatus and the coronal sulcus; intensity was increased from 0 V until the patient first perceived vibration; the mean of three measurements was recorded (V). Assessed at baseline and month 12.	Change = month-12 VPTT − baseline VPTT. A higher value means that a stronger stimulus is needed to perceive vibration, i.e. reduced glans sensitivity.	No universally accepted normal range; median baseline value in this cohort 4.0-4.2 V.
Mid-glans circumference increase	Glans circumference measured with a flexible tape at the mid-point of the glans in the flaccid state, before and 1 month after GPA-HA (mm). GPA-HA group only.	Increase = month-1 circumference − baseline circumference.	Not applicable.

IELT: intravaginal ejaculation latency time; PE: premature ejaculation; PEDT: Premature Ejaculation Diagnostic Tool; CGIC: Clinical Global Impression of Change; IIEF-5: International Index of Erectile Function-5; ED: erectile dysfunction; VPTT: vibratory perception threshold; GPA-HA: glans penis augmentation with hyaluronic acid.

by 63 (88.7%) and 102 (86.4%) patients, respectively (p = 0.647) (Figure 1).

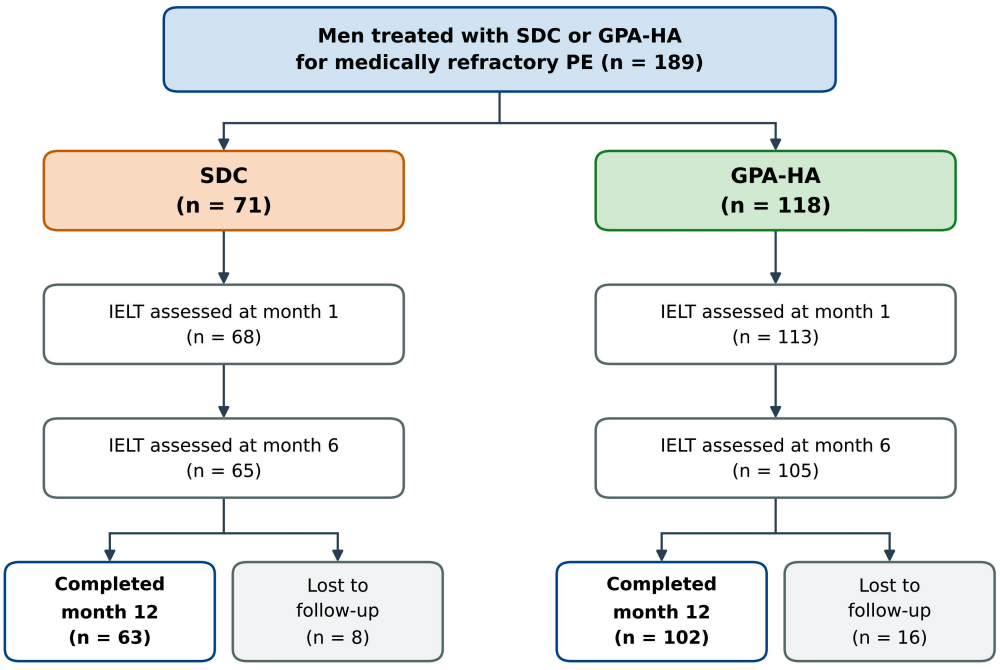
Patients lost to follow-up had similar baseline characteristics but a lower month-1 IELT response than those who completed follow-up (median fold increase 2.4 *vs* 6.0, p < 0.001). Patients in the SDC group were younger (35.3 ± 7.9 *vs* 38.5 ± 6.9 years, p = 0.004), more frequently had previous SSRI use (81.7% *vs* 59.3%, p = 0.001) and had a shorter baseline IELT (median 30 *vs* 38.5 s, p = 0.001); other baseline characteristics were similar (Table 2).

Both procedures significantly increased IELT at all visits compared with baseline (p < 0.001), whereas IELT decreased between month 1 and month 12 in both groups (p = 0.005 for SDC and p < 0.001 for GPA-HA). Median IELT at month 12 was 170 s with SDC and 130 s with GPA-HA, and absolute IELT values did not differ between the groups at any visit.

After adjustment for baseline IELT in the mixed-effects model, IELT at month 12 was on average 23% longer with SDC than with GPA-HA, but this difference was not statistically significant (ratio 1.23, 95% CI 0.94-1.60), and the difference between the groups did not change during follow-up (group × visit interaction, p = 0.407).

However, the relative IELT increase at month 12 was greater with SDC (median 4.7-fold *vs* 3.8-fold, p = 0.045), and treatment success was achieved in 79.4% and 63.7% of patients, respectively (p = 0.034; odds ratio (OR) 2.19, 95% CI 1.05-4.55). The difference remained significant in the worst-case analysis (70.4% *vs* 55.1%, p = 0.036) and in the inverse probability weighted analysis (OR 2.10, 95% CI 1.06-4.15), but was of borderline significance after multivariable adjustment (adjusted OR 2.18, 95% CI 0.97-4.86, p = 0.058) (Table 3).

PEDT scores were lower with SDC at all follow-up visits (month 12 median 7 *vs* 9, p = 0.002), and PEDT response at month 12 was observed in 81.7% and 65.7% of patients, respectively (p = 0.030). CGIC response was higher with SDC at month 1 (86.8% *vs* 70.3%, p = 0.011) and month 12 (84.7% *vs* 69.3%, p = 0.030), but not at month 6 (p = 0.095). IIEF-5 scores did not differ between the groups at any visit; a median decrease of 1 point was observed within the SDC group (p = 0.001), and erectile safety criteria were met by 95.1% and 91.1% of patients, respectively (p = 0.538). Glans VPTT (i.e. the lowest vibration intensity perceived at the glans) increased by a median of 2.5 V with SDC and 0.5 V with GPA-HA (p < 0.001); because a higher threshold means that a stronger stimulus is required for the vibration to be



Primary endpoint: completers (63 / 102). Worst-case and inverse probability weighted sensitivity analyses: all treated patients (71 / 118). Mixed-effects model: all available IELT measurements.

Figure 1.
Flow diagram of the study population. SDC: selective dorsal cryoablation; GPA-HA: glans penis augmentation with hyaluronic acid; IELT: intravaginal ejaculation latency time.

	SDC (n = 71)	GPA-HA (n = 118)	p value
Age (years)*	35.3 ± 7.9	38.5 ± 6.9	0.004
BMI (kg/m²)**	26.5 (24.0-28.7)	26.9 (24.8-29.2)	0.197
Hypertension, n (%)	6 (8.5%)	12 (10.2%)	0.697
Diabetes mellitus, n (%)	4 (5.6%)	8 (6.8%)	1.000†
Hyperlipidaemia, n (%)	3 (4.2%)	3 (2.5%)	0.674†
Smoking, n (%)	25 (35.2%)	45 (38.1%)	0.687
Alcohol use, n (%)	18 (25.4%)	34 (28.8%)	0.606
History of daily SSRI use, n (%)	58 (81.7%)	70 (59.3%)	0.001
History of topical anaesthetic use, n (%)	43 (60.6%)	72 (61.0%)	0.951
History of dapoxetine use, n (%)	19 (26.8%)	30 (25.4%)	0.839
Primary (lifelong) PE, n (%)	47 (66.2%)	66 (55.9%)	0.163
Baseline IELT (s)**	30 (20-41)	38.5 (29.5-52)	0.001
Baseline PEDT**	17 (16-19)	17 (15-18.25)	0.242
Baseline IIEF-5**	23 (21-24)	22 (21-24)	0.348
Baseline IIEF-5 < 22, n (%)	24 (33.8%)	39 (33.1%)	0.915
Baseline glans VPTT (V)**	4.0 (3.5-4.5)	4.2 (3.7-4.6)	0.059
Completed 12-month follow-up, n (%)	63 (88.7%)	102 (86.4%)	0.647

**Mean ± standard deviation; **median (interquartile range); †Fisher's exact test. SDC: selective dorsal cryoablation; GPA-HA: glans penis augmentation with hyaluronic acid; BMI: body mass index; SSRI: selective serotonin reuptake inhibitor; PE: premature ejaculation; IELT: intravaginal ejaculation latency time; PEDT: Premature Ejaculation Diagnostic Tool; IIEF-5: International Index of Erectile Function-5; VPTT: vibratory perception threshold.*

Table 2.
Baseline demographic and clinical characteristics of the study population.

perceived, this indicates a markedly greater reduction in glans sensitivity after SDC than after GPA-HA.

In the GPA-HA group, mid-glans circumference increased by 14.1 ± 4.5 mm and correlated weakly with month-12 CGIC ($\rho = 0.25$, $p = 0.011$) (Table 4).

Complications occurred in 23.9% of patients after SDC

IELT (s)*	SDC (n = 71)	GPA-HA (n = 118)	p value
Baseline	30 (20-41) (71)	38.5 (29.5-52) (118)	0.001
Month 1	180 (97-300) (68)	180 (80-360) (113)	0.580
Month 6	170 (91-300) (65)	150 (72-360) (105)	0.854
Month 12	170 (78-240) (63)	130 (60-285) (102)	0.675
Change from baseline to month 12 (s)	130 (50-193)	90.5 (22.25-230)	0.473
Fold increase at month 12	4.7 (2.6-8.2)	3.8 (1.8-7.0)	0.045
P for time (Friedman)‡	< 0.001	< 0.001	
Month 1 vs month 12 (Wilcoxon)‡	0.005	< 0.001	
Treatment success at month 12 (≥2.5-fold), completers§	50/63 (79.4%)	65/102 (63.7%)	0.034
Treatment success, lost to follow-up counted as failure	50/71 (70.4%)	65/118 (55.1%)	0.036
Mixed-effects model and logistic regression		**Ratio/OR (95% CI)**	**p value**
Month 1		1.11 (0.85-1.45)	0.443
Month 6		1.22 (0.93-1.60)	0.146
Month 12		1.23 (0.94-1.60)	0.139
Group × visit interaction			0.407
Success: crude OR (SDC vs GPA-HA)		2.19 (1.05-4.55)	0.034
Success: adjusted OR¶		2.18 (0.97-4.86)	0.058
Success: inverse probability weighted OR		2.10 (1.06-4.15)	0.033

** Median (interquartile range) (number of patients assessed). ‡ Within-group comparisons in patients with complete IELT measurements (SDC n = 61, GPA-HA n = 95); all pairwise comparisons with baseline p < 0.001 (Wilcoxon signed-rank test, Bonferroni-corrected). § IELT increase ≥ 2.5 times baseline. Mixed-effects model: ratio of geometric mean IELT (SDC/GPA-HA) adjusted for baseline log-IELT, with a random intercept per patient. ¶ Adjusted for age, lifelong PE, baseline log-IELT, previous SSRI use and baseline PEDT.*
SDC: selective dorsal cryoablation; GPA-HA: glans penis augmentation with hyaluronic acid; OR: odds ratio; CI: confidence interval.

Table 3. *Intravaginal ejaculation latency time (IELT) during the 12-month follow-up.*

	SDC (n = 71)	GPA-HA (n = 118)	p value
PEDT**			
Baseline	17 (16-19)	17 (15-18.25)	0.242
Month 1	8 (6-12)	11 (9-13)	< 0.001
Month 6	7 (5-10)	9 (7-11)	0.002
Month 12	7 (5-10)	9 (7-12)	0.002
P for time (Friedman)‡	< 0.001	< 0.001	
IIEF-5**			
Baseline	23 (21-24)	22 (21-24)	0.348
Month 1	22 (20-24)	22 (20-24)	0.937
Month 6	22 (20.25-24)	22 (20.25-24)	0.986
Month 12	22 (20-24.5)	22 (19.5-24)	0.744
P for time (Friedman)‡	0.003	0.193	
IIEF-5 change, baseline to month 12**	−1 (−2 to 0)	0 (−1 to 1)	0.193
PEDT response at month 12 (PEDT < 11)	49/60 (81.7%)	65/99 (65.7%)	0.030
Erectile safety at month 12 (IIEF-5 decrease ≤ 3)	58/61 (95.1%)	92/101 (91.1%)	0.538†
CGIC response (≥ +2)			
Month 1	59/68 (86.8%)	78/111 (70.3%)	0.011
Month 6	54/64 (84.4%)	77/105 (73.3%)	0.095
Month 12	50/59 (84.7%)	70/101 (69.3%)	0.030
Glans VPTT (V)**			
Baseline	4.0 (3.5-4.5)	4.2 (3.7-4.6)	0.059
Month 12	6.5 (5.0-7.6)	4.7 (4.0-5.4)	< 0.001
Change	2.5 (1.2-3.4)	0.5 (0.0-1.1)	< 0.001
Mid-glans circumference increase at month 1 (mm)*	-	14.1 ± 4.5	

** Mean ± standard deviation; ** median (interquartile range); † Fisher's exact test; ‡ within-group comparison in patients with complete measurements.*
Proportions are given as n/number assessed (%).
SDC: selective dorsal cryoablation; GPA-HA: glans penis augmentation with hyaluronic acid; PEDT: Premature Ejaculation Diagnostic Tool; IIEF-5: International Index of Erectile Function-5; CGIC: Clinical Global Impression of Change; VPTT: vibratory perception threshold.

Table 4. *Patient-reported outcomes, erectile function and glans sensitivity during follow-up.*

	SDC (n = 71)	GPA-HA (n = 118)	p value
Any complication	17 (23.9%)	17 (14.4%)	0.098
Glans hypoesthesia (total)	11 (15.5%)	-	< 0.001†
Transient	10 (14.1%)	-	
Persistent at month 12	1 (1.4%)	-	
Transient paraesthesia (complete resolution)	3 (4.2%)	1 (0.8%)	0.150†
Transient delayed ejaculation/orgasmic difficulty (< 3 months)	2 (2.8%)	-	
Entry-site haematoma	1 (1.4%)	-	
Oedema	-	5 (4.2%)	
Injection-site discomfort	-	4 (3.4%)	
Ecchymosis	-	3 (2.5%)	
Palpable nodule	-	2 (1.7%)	
Glans asymmetry	-	2 (1.7%)	

Each patient experienced at most one complication.
† Fisher's exact test.
SDC: selective dorsal cryoablation; GPA-HA: glans penis augmentation with hyaluronic acid.

Table 5. *Procedure-related complications within 12 months.*

and 14.4% after GPA-HA (p = 0.098). Glans hypoesthesia was observed only after SDC (15.5% *vs* 0%, p < 0.001); it was transient in 10 patients and persisted at month 12 in one patient. Oedema, injection-site discomfort, ecchymosis, palpable nodule and glans asymmetry were seen only after GPA-HA (Table 5).

Discussion

The number of patients diagnosed with PE is increasing due to heightened awareness of sexual health disorders, easier access to medical care and the dissemination of health-related information via social media. Despite the wide range of medical therapies, a considerable number of patients discontinue treatment or do not respond adequately and seek procedural management (10). To our knowledge, this is the first study comparing SDC and GPA-HA, and we found a greater relative IELT improvement and better PEDT and CGIC outcomes with SDC, although absolute IELT values were comparable and glans hypoesthesia was more frequent after SDC.

IELT is defined as the stopwatch-measured time from vaginal penetration to ejaculation and is regarded as the standard method for assessing the effectiveness of PE treatment (11), and PEDT is a validated five-item questionnaire for the diagnosis of PE (12). *Zhang and colleagues* reported that IELT increased from 1.1 to 3.8 minutes after selective resection of the dorsal penile nerves (13), and a meta-analysis of selective dorsal neurectomy and cryoablation revealed a mean IELT increase of 147.5 s with an adverse event rate of 11.2% (14). *Kwak et al.* reported an increase of IELT from 84.2 s to 376.7 s at 6 months after GPA-HA (15). More recently, *Başağa et al.* reported that IELT increased from 54.4 s to 231.3 s and PEDT decreased from 14.3 to 8.4 at 12 months after SDC (7), and in a 24-month single-arm SDC series, 83.0% of patients met the success criteria at month 12 (8). However, none of these studies compared SDC and GPA-HA.

In the present study, SDC provided a greater relative IELT increase, a higher success rate and lower PEDT values, which we believe are associated with the interruption of transmission in the nerve trunk. This is supported by the marked increase in glans VPTT after SDC, which is consistent with the objective desensitisation reported by *Başağa et al.* (7). On the other hand, absolute IELT values were similar after adjustment for baseline IELT, and the advantage in treatment success was of borderline significance after multivariable adjustment; therefore, part of the observed difference may be attributable to the shorter baseline IELT in the SDC group. In addition, IELT decreased between month 1 and month 12 in both groups, in line with the gradual decline reported over 24 months after SDC (8), which may reflect nerve regeneration after cryoablation and HA resorption after GPA-HA.

The CGIC is a 7-point scale evaluating the patient's global impression of treatment outcome (9). Satisfaction rates of 64.9-75% have been reported after GPA-HA (16, 17), and in a nationwide survey of urologists, the outcomes of selective dorsal neurectomy were rated as satisfactory or acceptable in nearly 96% of patients (18); however, these studies did not use a validated instrument. In our study, CGIC response rates were higher with SDC at month 1 and month 12. Because GPA-HA also increases glans size, the weak correlation between glans circumference increase and CGIC suggests that the global impression of GPA-HA patients may be partly influenced by the cosmetic effect of the procedure.

Erectile dysfunction is one of the most undesirable adverse effects of PE treatment. SSRIs and topical anaesthetics have been associated with ED (19, 20), and penile sensory abnormalities and ED have been reported after selective dorsal neurotomy (21). In the present study, IIEF-5 scores were similar between the groups; the one-point decrease after SDC is unlikely to be clinically meaningful, and most patients in both groups met the erectile safety criteria. Although overall complication rates did not differ significantly, sensory complications were significantly more frequent after SDC, and patients should be informed about this risk before the procedure. Of note, current guidelines advise against dorsal neurectomy until more safety data become available (22). SDC differs from neurectomy in being a non-excisional and poten-

tially reversible technique (7), and we believe that comparative safety data, such as those presented here, may contribute to defining its place in the management of PE. This study has limitations. The retrospective design and the lack of long-term outcomes are the main ones. Selection of the procedure was based on a joint decision of the doctor and the patient, which resulted in baseline differences between the groups; although we adjusted for these variables, residual confounding cannot be excluded. In addition, 12.7% of patients were lost to follow-up and had a lower early IELT response, although sensitivity analyses yielded consistent results, and IELT was measured at home and reported by patients. Patient and partner quality of life and cost were not evaluated and should be the subject of further research.

Conclusions

Both SDC and GPA-HA are effective treatment options for medically refractory PE. SDC provides a greater relative IELT improvement and better PEDT and CGIC outcomes than GPA-HA during one year of follow-up, at the cost of a higher rate of glans hypoesthesia. These findings should be confirmed by prospective randomized studies with larger numbers of patients.

Declarations

Ethical approval and consent for participate: *The study was approved by the Clinical Research Ethics Committee of Haseki Training and Research Hospital (protocol/decision no. 262-2026, 30 September 2026) and was conducted in accordance with the Declaration of Helsinki. Written informed consent for the procedures was obtained from all patients; the requirement for consent for the use of anonymised clinical data was waived by the ethics committee owing to the retrospective design.*

Consent for publication: *Not applicable; the manuscript contains no identifiable patient data or images.*

Availability of data and material: *The data supporting the findings of this study are available from the corresponding author upon reasonable request.*

Competing interests: *The authors declare that they have no competing interests.*

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Authors' contributions: *ASG, study concept and design, data collection, data curation, manuscript drafting; AE, methodology, statistical analysis, validation, critical revision of the manuscript; FÖ, data collection, data curation, critical revision of the manuscript; FA, supervision, critical revision of the manuscript. All the authors read and approved the final version of the manuscript.*

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References

1. Serefoglu EC, McMahon CG, Waldinger MD, et al. An evidence-based unified definition of lifelong and acquired premature ejaculation: report of the second International Society for Sexual Medicine Ad Hoc Committee for the Definition of Premature Ejaculation. Sex Med 2014; 2:41-59.

2. Porst H, Montorsi F, Rosen RC, et al. The Premature Ejaculation Prevalence and Attitudes (PEPA) survey: prevalence, comorbidities, and professional help-seeking. Eur Urol 2007; 51:816-24.

3. Martin-Tuite P, Shindel AW. Management options for premature ejaculation and delayed ejaculation in men. Sex Med Rev 2020; 8:473-85.

4. Moon DG. Is there a place for surgical treatment of premature ejaculation? Transl Androl Urol 2016; 5:502-7.

5. Prologo JD, Snyder LL, Cherullo E, et al. Percutaneous CT-guided cryoablation of the dorsal penile nerve for treatment of symptomatic premature ejaculation. J Vasc Interv Radiol 2013; 24:214-9.

6. Abdallah H, Abdelnasser T, Hosny H, et al. Treatment of premature ejaculation by glans penis augmentation using hyaluronic acid gel: a pilot study. Andrologia 2012; 44(Suppl 1):650-3.

7. Başağa Y, Albayrak AT, Sertkaya Z, et al. Clinical outcomes of selective dorsal cryoneurolysis in patients with lifelong premature ejaculation: a retrospective cohort of 108 men. J Sex Med 2026; 23:qdag284.

8. Güleser AS, Eren A. Medium-term outcomes of selective dorsal cryoablation in medically refractory lifelong premature ejaculation: a 24-month follow-up study. Rev Int Androl 2026; 24:46-52.

9. Pryor JL, Althof SE, Steidle C, et al. Efficacy and tolerability of dapoxetine in treatment of premature ejaculation: an integrated analysis of two double-blind, randomised controlled trials. Lancet 2006; 368:929-37.

10. Park HJ, Park NC, Kim TN, et al. Discontinuation of dapoxetine treatment in patients with premature ejaculation: a 2-year prospective observational study. Sex Med 2017; 5:e99-105.

11. Waldinger MD, Quinn P, Dilleen M, et al. A multinational population survey of intravaginal ejaculation latency time. J Sex Med 2005; 2:492-7.

12. Symonds T, Perelman MA, Althof S, et al. Development and validation of a premature ejaculation diagnostic tool. Eur Urol 2007; 52:565-73.

13. Zhang GX, Yu LP, Bai WJ, et al. Selective resection of dorsal nerves of penis for premature ejaculation. Int J Androl 2012; 35:873-9.

14. Culha MG, Erkoc M, Baran C, Ozcan L. Clinical efficacy and safety of selective dorsal neurectomy/cryoablation for treatment of premature ejaculation: systematic review and meta-analysis. J Sex Med 2025; 22:1383-9.

15. Kwak TI, Jin MH, Kim JJ, Moon DG. Long-term effects of glans penis augmentation using injectable hyaluronic acid gel for premature ejaculation. Int J Impot Res 2008; 20:425-8.

16. Shebl SE, Ali S, Shokr M. Hyaluronic acid injection in the glans penis for the treatment of refractory premature ejaculation: a prospective, controlled study. Andrologia 2021; 53:e14084.

17. Kim JJ, Kwak TI, Jeon BG, et al. Effects of glans penis augmentation using hyaluronic acid gel for premature ejaculation. Int J Impot Res 2004; 16:547-51.

18. Yang DY, Ko K, Lee WK, et al. Urologist's practice patterns including surgical treatment in the management of premature ejaculation: a Korean nationwide survey. World J Mens Health 2013; 31:226-31.

19. Lasker GF, Halis F, Gokce A. Selective serotonin reuptake inhibitors for premature ejaculation: review of erectile and ejaculatory side effects. Curr Drug Saf 2014; 9:118-26.

20. Dinsmore WW, Hackett G, Goldmeier D, et al. Topical eutectic mixture for premature ejaculation (TEMPE): a novel aerosol-delivery form of lidocaine-prilocaine for treating premature ejaculation. BJU Int 2007; 99:369-75.

21. Tang QL, Song T, Han YF, et al. The application of intraoperative neurophysiological monitoring in selective dorsal neurotomy for primary premature ejaculation: a prospective single-center study. Asian J Androl 2023; 25:137-42.

22. European Association of Urology. EAU Guidelines on Sexual and Reproductive Health. Arnhem: EAU Guidelines Office; 2025 (accessed 5 October 2026). Available from: https://uroweb.org/guidelines/sexual-and-reproductive-health

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