



Urologists' Perceptions and Practice Patterns in Peyronie's Disease: A Korean Nationwide Survey Including Patient Satisfaction

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Purpose: A nationwide survey was conducted of Korean urologists to illustrate physicians' perceptions and real practical patterns regarding Peyronie disease (PD).

Materials and Methods: A specially designed questionnaire exploring practice characteristics and attitudes regarding PD, as well as patient satisfaction with each treatment modality, was e-mailed to 2,421 randomly selected urologists.

Results: Responses were received from 385 practicing urologists (15.9%) with a median time after certification as an urologist of 12 years. Regarding the natural course, 87% of respondents believed that PD is a progressive disease, and 82% replied that spontaneous healing in PD occurred in fewer than 20% of patients. Regarding diagnosis of PD, the methods used were, in order, history taking with physical examination (98%), International Index of Erectile Function questionnaires (40%), intracavernous injection and stimulation (35%), and duplex sonography (28%). Vitamin E was most preferred as an initial medical management (80.2%), followed by phosphodiesterase-5 inhibitors (27.4%) and Potaba (aminobenzoate potassium, 20.1%). For urologists who administered intralesional injection, the injected agent was, in order, corticosteroid (72.2%), verapamil (45.1%), and interferon (3.2%). The most frequently performed surgical procedure was plication (84.1%), followed by excision and graft (42.9%) and penile prosthesis implantation (14.2%). Among the most popular treatments in each modality, the urologists' perceptions regarding the suitability of treatment and patient satisfaction were significantly different, favoring plication surgery.

Conclusions: The practice pattern of urologists depicted in this survey is in line with currently available Western guidelines, which indicates the need for development of further local guidelines based on solid clinical data.

Keywords: Data collection; Penile induration; Perception

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INTRODUCTION

Peyronie disease (PD) is a connective tissue disorder that is characterized by localized fibrotic plaques in the tunica albuginea, most commonly on the dorsal surface of the pe-

nis, that result in penile bending and often pain [1]. As an initial trigger, an inflammatory process and subsequent aberrant wound healing by repetitive trauma to the penis during intercourse has gained widespread acceptance [2,3]. This inflammatory process itself is self-limited and

the pain typically resolves with time [4]. Unfortunately, by progression, the penile deformity remains in 90% to 95% of patients, with surgery remaining as the sole conclusive treatment for this sequel [5]. In addition, PD is frequently associated with erectile dysfunction (ED); in a recent retrospective study of 1,001 patients with PD, 58.1% of patients reported having ED [6]. Diagnosis of PD is based on sexual history and careful physical examination of the penis, which are sufficient for establishment of the diagnosis [7].

In contrast, owing mainly to an incomplete understanding of the exact pathogenesis, the optimal management of PD remains a clinical dilemma, particularly the nonsurgical approach. Despite a wide spectrum of currently available treatment options, including oral agents, intralesional injection, extracorporeal shock wave therapy, and external traction therapy [8-11], none of these has demonstrated conclusive effects and most studies of these treatments did not have a placebo-controlled design. To date, none of these treatment options carries a grade A recommendation according to contemporary Western guidelines [7]; thus, the clinical strategy for management of PD is primarily dependent on the preferences of physicians and patients. However, incorrect and outdated information on this condition from the first-encountered physician may cause misdiagnosis or mislead the patient into unrealistic beliefs, as demonstrated in a recent survey on primary care physicians and urologists [12]. With this background, we conducted a survey to elucidate the actual diagnosis and treatment patterns, including nonsurgical and surgical approaches, by Korean urologists. We also intended to assess each treatment modality, as preliminary data for creation of further local guidelines on PD, by evaluation not only of the urologists' perceptions from the point of view of the suitability of the treatment for PD, but also of patient satisfaction with each management modality investigated by the urologist.

MATERIALS AND METHODS

A probability sample was taken from the Korean Urological Association Registry of Physicians, and a specially designed questionnaire was e-mailed to 2,421 randomly selected urologists. The purpose of the survey was to explore the practice characteristics and attitudes of each urologist. In this study, the researchers observed human subjects set forth in the Helsinki Declaration of the compliance with ethical principles of medical research. The survey contained 56 questions on PD-related symptoms and diagnosis of PD (n=13), methods for management of PD (n=37), and general questions about demographics (n=6). In questions on the available method used in the diagnosis and treatment of PD, multiple-choice was permitted, given the current uncertainty in the management of PD. As an attempt to identify proper methods for treatment of PD, we asked the urologists about their perceptions from the point of view of the suitability of each treatment and modality, which was divided into a scale with five grades (1, below

20%; 2, 20%–39%; 3, 40%–59%; 4, 60%–79%; and 5, over 80%), and patient satisfaction, which was estimated by use of a scale from 0 to 10 (0, no satisfaction; 10, full satisfaction). The survey is included in the Supplementary questionnaire.

RESULTS

Responses were received from 385 practicing urologists (15.9%). Among them, 263 were from nontraining hospitals, including 68.3% of responses (231/385) from primary care urologists and 122 responses from university-training hospitals (21.7%). The median duration after certification as an urologist was 12 years (range, 0–41 years), and 59% (227/385) had clinical experience of more than 10 years. Of the respondents, 66% (255/385) had treated fewer than five patients with PD per year, whereas 16.6% of urologists saw more than 10 PD patients (64/385).

The most bothersome symptom causing patients to visit the urology clinic was penile curvature (75.1%, 289/385), followed by painful erection (13.5%, 52/385), difficulty in penetration (4.2%, 16/385), and ED (2.1%, 8/385). Plaques were palpable in approximately half of cases (193/383). Regarding the interval from development of symptoms to seeking a specialist, 47.5% of urologists (182/383) answered that their patients visited between 6 and 12 months from the development of symptoms, followed by 3 to 6 months (32.6%, 125/383). Regarding the natural course, most urologists (87.8%, 338/383) believed that PD is a progressive disease. Similarly, most urologists (82.2%, 315/383) responded that spontaneous healing in PD occurred in fewer than 20% of patients. For these two questions, the working year after certification of the urologist or the type of institution they worked for showed no statistical difference (Table 1). On a multiple-choice question regarding diagnostic method for PD, the responses were, in order, history taking with physical examination (97.9%, 375/385), International Index of Erectile Function (IIEF) questionnaires (39.7%, 152/385), combined intracavernous injection and stimulation (34.7%, 133/385), and duplex sonography (28.2%, 108/385).

As for the proper timing to initiate management of PD regardless of medical or surgical approaches, 44.1% of urologists (169/383) responded "when penile curvature or pain occurred," followed by "when the patient wants" (38.1%, 146/383) and "when the penile nodule was identified" (13.8%, 53/383). Vitamin E was the most preferred initial medical management for 80.2% of respondents (307/385), followed by phosphodiesterase-5 (PDE-5) inhibitors (27.4%, 105/383), Potaba (aminobenzoate potassium; 20.1%, 77/383), carnitine (16.7%, 64/383), colchicine (11.7%, 45/383), tamoxifen (10.4%, 40/383), and pentoxifylline (7.0%, 27/383). However, among the three most common of these, the urologists' perception from the point of view of the suitability of treatment and patient satisfaction with the treatment were significantly different ($p < 0.001$ and $p < 0.001$, respectively, by chi-square test) (Fig. 1A, B).

TABLE 1. Summary of outcomes from questions regarding the natural course of Peyronie disease (PD)

| Demographics of urologist | Do you think PD is progressive disease? | | p-value | How many proportion of the PD patient experienced spontaneous healing? | | | | | p-value |
|--|---|-----------|---------|--|-----------|----------|---------|----------|---------|
| | Yes | No | | Below 20% | 20%-39% | 40%-59% | 60%-79% | Over 80% | |
| Characteristics of Institution | | | | | | | | | |
| Nonacademic institution | 229 (87.7) | 32 (12.3) | | 218 (83.5) | 24 (9.2) | 16 (6.1) | 2 (0.8) | 1 (0.4) | |
| Academic institution | 109 (89.3) | 13 (10.7) | | 97 (79.5) | 19 (15.6) | 5 (4.1) | 1 (0.8) | - | |
| Total | 338 (88.3) | 45 (11.7) | 0.614 | 315 (82.2) | 43 (11.2) | 21 (5.5) | 3 (0.8) | 1 (0.3) | 0.650 |
| Duration after certification as urological specialist | | | | | | | | | |
| Below 10 years | 141 (89.2) | 17 (10.8) | | 133 (84.2) | 15 (9.5) | 8 (5.1) | 2 (1.3) | - | |
| Over 10 years | 197 (87.6) | 28 (12.4) | | 182 (80.9) | 28 (12.4) | 13 (5.8) | 1 (0.4) | 1 (0.4) | |
| Total | 338 (88.3) | 45 (11.7) | 0.657 | 315 (82.2) | 43 (11.2) | 21 (5.5) | 3 (0.8) | 1 (0.3) | 0.370 |

Values are presented as number (%).

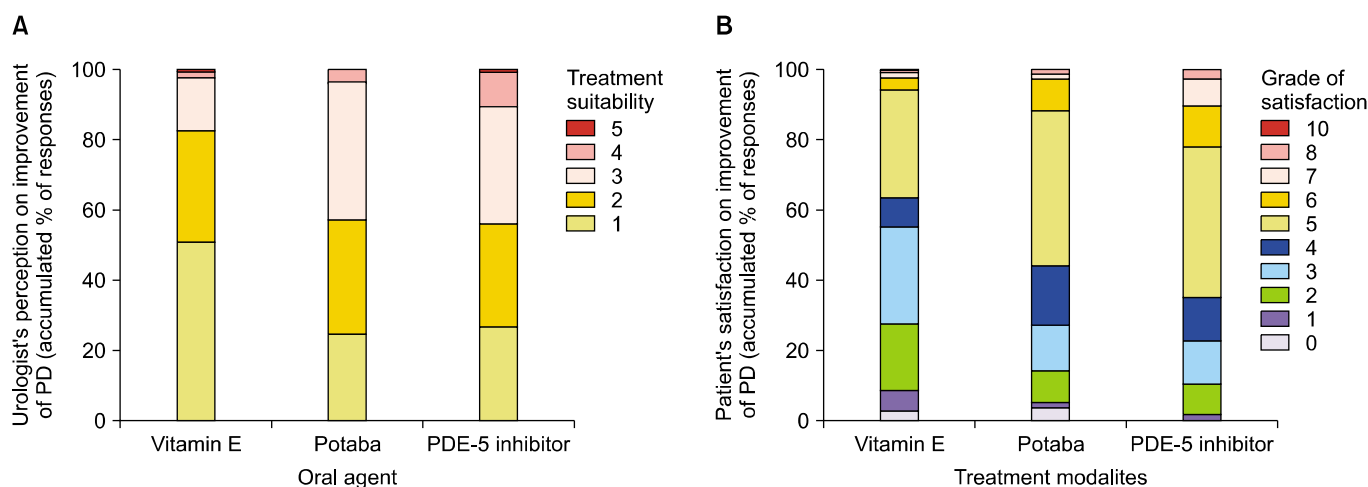


FIG. 1. Urologists' perceptions regarding the suitability of treatment (A: 1, below 20%; 2, 20%-39%; 3, 40%-59%; 4, 60%-79%; and 5, over 80%) and patient satisfaction (B: estimated by 10 grades [0, no satisfaction; 10, full satisfaction]) with three common oral treatments used for Peyronie disease (PD). PDE-5, phosphodiesterase-5.

Seventy-two urologists (277/385) replied positively on the use of intralesional injection. Regarding combination with an oral agent, 41.8% of urologists (160/383) initiated injection when oral medication had failed; however, 35.3% started injection from the beginning of use of an oral agent (136/383). The most preferred injection protocol was that administered on a weekly basis (89.6%, 240/268), with duration of less than 12 weeks (94.9%, 263/277). The preferred injection agent was, in order, corticosteroid (72.2%, 200/277), verapamil (45.1%, 125/277), and interferon (3.2%, 9/277); however, the type of agent did not have an effect on either urologists' perception regarding the suitability of treatment or patient satisfaction ($p=0.485$ and $p=0.498$) (Fig. 2A, B).

Urologists who responded considered surgical treatment, particularly when initial oral and injection therapy had failed (67.6%, 259/383). Thirty-eight percent of respondents (148/383) performed surgery for PD in their own clinic, whereas the others (61%) did not. The most frequently performed procedure was plication (84.1%,

190/226), followed by excision and graft (42.9%, 97/226), penile prosthesis implantation (14.2%, 32/226), and others (1.3%, 3/226). Among these procedures, urologists' perception and patient satisfaction were significantly different ($p=0.001$ and $p=0.002$) (Fig. 3A, B), favoring penile prosthesis implantation. Among the most popular treatments in each modality among oral agents, intralesional injection, and surgery, the outcomes were also different ($p < 0.001$ and $p < 0.001$) (Fig. 4A, B), favoring plication surgery.

DISCUSSION

Although PD has been recognized for over 200 years, no consensus exists, particularly with regard to the standard treatment of this condition. On the basis of contemporary Western guidelines, surgery is the only recommended treatment option [7], and plication techniques have been used almost exclusively in cases of isolated penile curvature with high curvature correction rates. In contrast, the nonsurgical modalities have shown little progress and

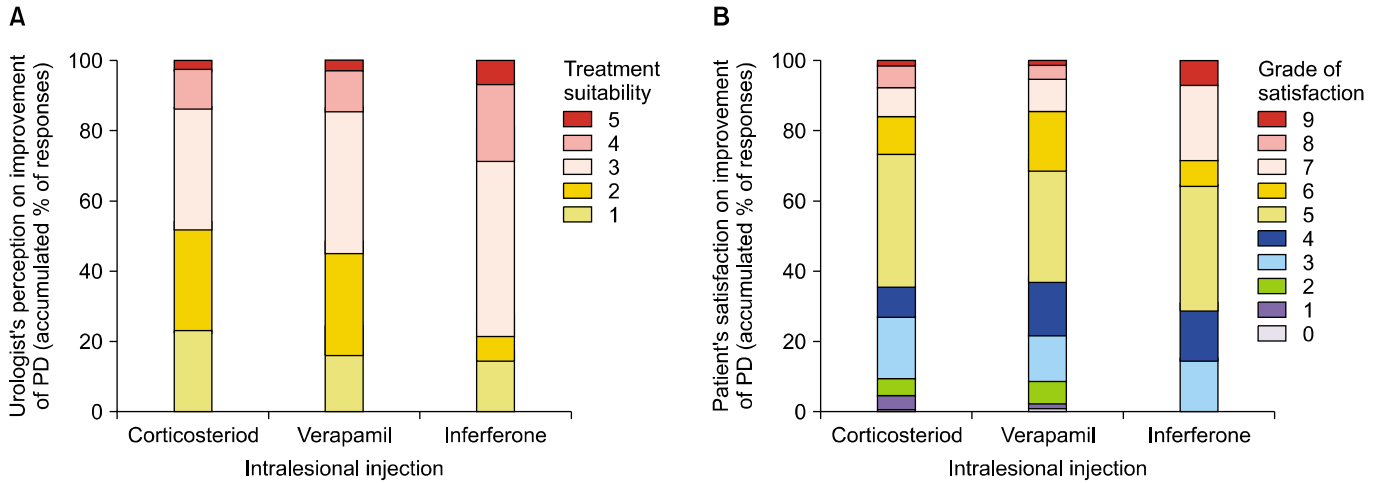


FIG. 2. Urologists' perceptions regarding the suitability of treatment (A: 1, below 20%; 2, 20%-39%; 3, 40%-59%; 4, 60%-79%; and 5, over 80%) and patient satisfaction (B: estimated by 10 grades [0, no satisfaction; 10, full satisfaction]) with three common intravesical injections used for Peyronie disease (PD).

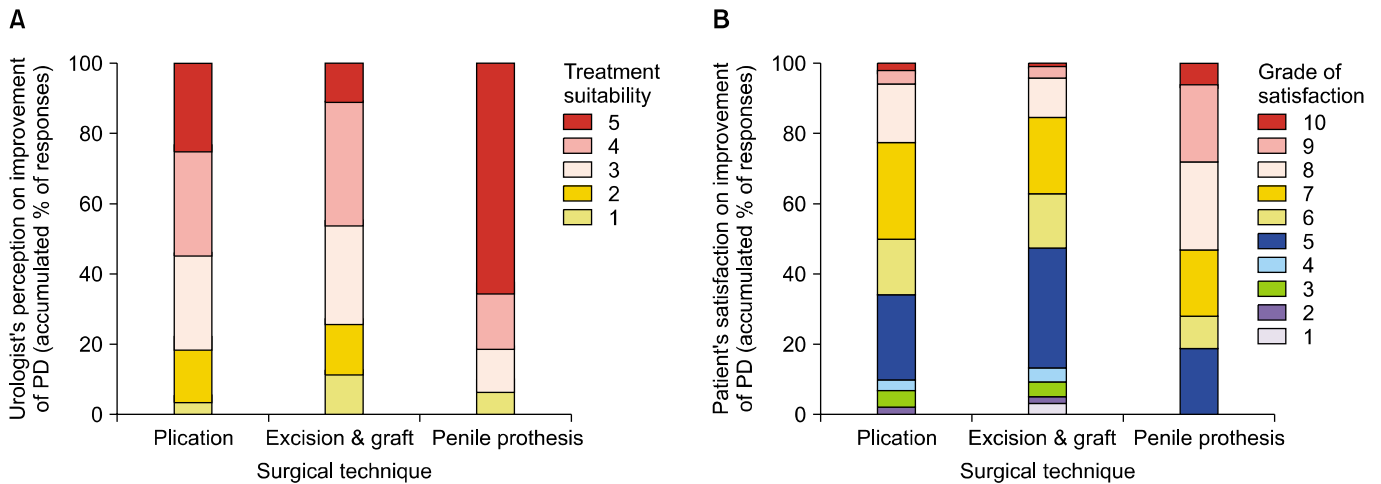


FIG. 3. Urologists' perception regarding the suitability of treatment (A: 1, below 20%; 2, 20%-39%; 3, 40%-59%; 4, 60%-79%; and 5, over 80%) and patient satisfaction (B: estimated by 10 grades [0, no satisfaction; 10, full satisfaction]) with three common surgical techniques used for Peyronie disease (PD).

have not kept pace with the surgical options in the treatment of PD. To date, there are no U.S. Food and Drug Administration-approved, nonsurgical options. Nevertheless, it is also true that there is interest in PD, mainly as a result of improved recognition, widespread use of PDE-5 inhibitors, and increasing sexual activity of older men and resultant injury of the penis. Indeed, the prevalence of PD appears to be 3 to 10 fold higher than previously estimated [13]. By definition, patients being seen in our clinic complaining of PD are highly motivated; hence, the actual occurrence of this disease within the population may be higher owing to patients' reluctance to come to their physician for treatment and diagnosis of this embarrassing condition [14].

Besides its efficacy in the treatment of deformity, surgery is indicated when PD is stable for at least 3 months, which is usually the case after 12 months from the onset

of symptoms, and intercourse is compromised as a result of deformity [7]. In addition, surgery may be associated with complications and the possibility of penile shortening [15,16]. Therefore, based on limited placebo-controlled clinical trial support, physicians usually have no choice but to recommend nonsurgical options, reserving surgery for patients in the chronic phase of PD with deformity and interference in sexual function.

To the best of our knowledge, this is the first nationwide survey to address the practice patterns and general perceptions about PD of urologists in Korea, as well as patient satisfaction with the management of PD. The outcomes of this study include several interesting findings which deserve to be addressed. First, the Korean urologists' perceptions regarding the natural course of PD and diagnostic approaches were analogous with currently available Western guidelines. The majority of urologists (87.8%) believed that

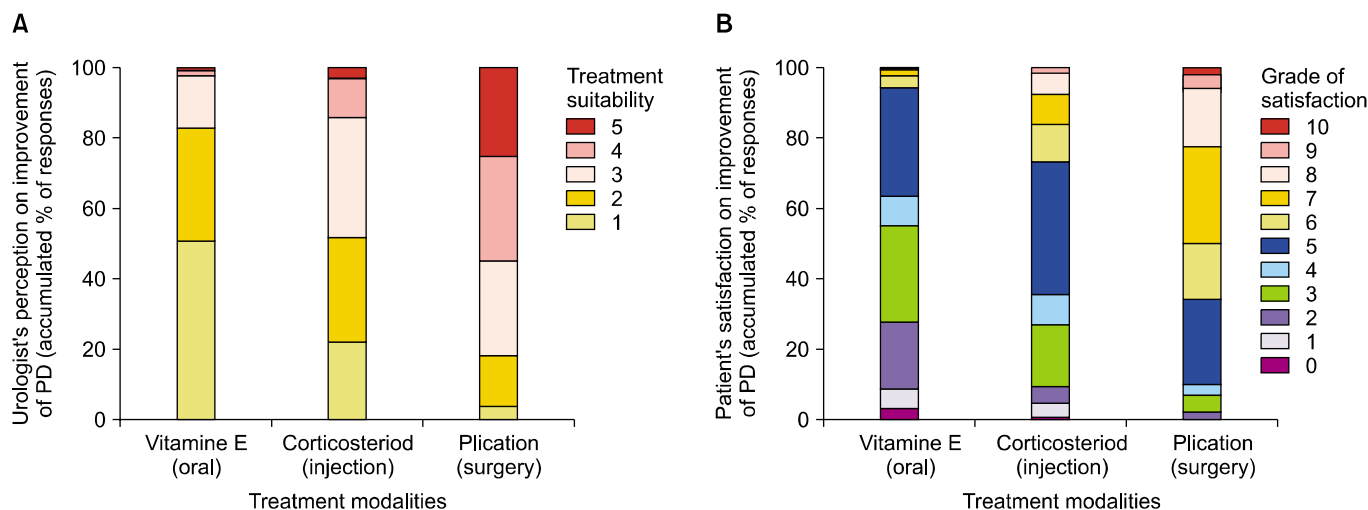


FIG. 4. Urologists' perception regarding the suitability of treatment (A: 1, below 20%; 2, 20%–39%; 3, 40%–59%; 4, 60%–79%; and 5, over 80%) and patient satisfaction (B: estimated by 10 grades [0, no satisfaction; 10, full satisfaction]) with the most popular methods in each modality among oral agents, intralesional injection, and surgery used for treatment of Peyronie disease (PD).

PD is a progressive condition, and more than 81% of respondents believed that spontaneous healing in PD occurs in fewer than 20% of patients. These observations are quite the opposite of the outcomes reported by LaRochelle and Levine [12], whose group conducted a survey on PD in the United States. In their study, 17% of primary care physicians and 38% of urologists believed that the disease resolves spontaneously in more than 50% of cases. It is also notable that in this survey, these notions were not affected by the duration in practice as a urological specialist or the type of medical institution in which the urologist worked (Table 1). This is in contrast with the depictions by LaRochelle and Levine [12], in which urologists who had been in practice for more than 10 years were more likely to have incorrect assumptions about PD than were urologists in practice for less than 10 years. Regarding diagnostic approaches, most of the respondents in this survey performed physical examination, and approximately 40% evaluated potentially concomitant ED by use of the IIEF questionnaire. This also contrasts with the findings of the survey conducted by LaRochelle and Levine [12], where nearly one in two primary care physicians and one in six urologists did not perform routine examination of the patient's penis.

Second, regarding a nonsurgical approach, whereas vitamin E was used primarily for initial oral management by more than 80% of respondents, its reported efficacy was relatively lower both according to the physicians' perception of treatment suitability and patient satisfaction in comparison with other oral agents. In contrast, for intralesional injection, physicians' perception of treatment suitability and patient satisfaction were not affected by the agents injected. Among the most common choices in oral and intralesional injection, corticosteroid injection was significantly better perceived by both patients and physicians in comparison with vitamin E. However, this outcome

should be interpreted with caution, considering that there is currently no conservative treatment that eventually results in complete relief of all symptoms, including pain, plaque formation, and penile curvature [7]. Indeed, several double-blind, placebo-controlled trials on the use of vitamin E, Potaba, propoleum, tamoxifen, colchicine, acetyl-L-carnitine, propionyl-L-carnitine, and omega-3 fatty acids for the treatment of PD have been conducted, usually with minor or little proven effect [17–23]. With regard to intralesional injection therapy, whereas 90% of the studies reported positive outcomes, most of those studies did not offer convincing evidence-based data, hampered by their small patient populations [24]. Despite initial promising results, in a recent placebo-controlled, single-blind trial of intralesional verapamil injection, no significant improvements were observed in penile curvature, plaque size, or penile pain [25].

The most peculiar finding in this survey was that the highest grade in both patient satisfaction and physicians' perception of the suitability of treatment was achieved by the surgical approach, as shown in Fig. 4. Currently, owing to a lack of any nonsurgical management that can definitively alter the progression of the disorder, surgical intervention is the only efficacious treatment for PD. If there is ED that is not responding to pharmacologic treatment, the best option from contemporary guidelines is the implantation of an inflatable penile prosthesis, with or without an associated procedure over the penis (modeling, plication, or even grafting plus the prosthesis) [7]. Indeed, for the surgical techniques, the urologists' perception and patient satisfaction were significantly different, favoring penile prosthesis implantation with a relatively higher grade in both aspects (Fig. 3).

Finally, in this survey, the duration of time to a doctor visit was relatively shorter than that reported in Western countries, where approximately one-third of PD patients

did not see a doctor until 4 years after the emergence of penile symptoms [26]. This is also in contrast with a widely accepted notion that members of the Asian population are highly sexually conservative and less sexually active [27]. While distinctions including medical insurance systems, accessibility to medical suppliers, and cultural differences should be considered, this aspect reflects the urgent need for active treatment for patients suffering from this embarrassing condition.

A strength of the current study is the recruitment of a reply from 385 acting urologists; to the best of our knowledge, this is the largest number of urologists recruited by use of a detailed survey, particularly on PD. However, we also recognize the weakness of the current study. A possible criticism of this study is the response rate of 15.9%, which is far from that required to attain representativeness among practicing Korean urologists. Because the categories on the questionnaire used in the survey were not designed to permit direct comparison, limited information can be obtained, particularly on the diagnostic approach and efficacy of treatment. In addition, many other factors in terms of patient or physician demographics that were not investigated in this survey may have an effect on the outcomes. Indeed, because these data were obtained only from urologists from the physician's point of view, the actual characteristics and responses of the patients remain obscure. In the future, conduct of local population-based studies and randomized controlled trials will be needed; until then, approaches based on currently available guidelines are still recommended. Eventually, the development of integrated curricular and specialized guidelines for Korean males supported by local data on treatment of PD may be required.

CONCLUSIONS

The results of our current survey provided insights into the clinical practice of Korean urologists in the treatment of PD. The urologists' recognition of PD is in line with current understanding of this disease, and the diagnosis was based mainly on history taking and physical examination. Among various treatment approaches, surgery was the most effective modality from the perspective of both the urologists' perceptions regarding the suitability of treatment and patient satisfaction. These observations indicate the need for development of practical local guidelines based on solid clinical data and to ensure that these guidelines are widely promoted and accepted by the urological community.

CONFLICTS OF INTEREST

The authors have nothing to disclose.

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SUPPLEMENTARY MATERIALS

Supplementary questionnaire can be found via <http://kju-urology.org/src/sm/kju-55-57-s001.pdf>.

Questionnaires for Peyronie disease.

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