



# General Surgeons' Approach to Pilonidal Abscess in Turkey: Results of a Nationwide Survey

İbrahim Halil Özata<sup>1</sup>, Çiğdem Arslan<sup>2</sup>, Salih N. Karahan<sup>1</sup>, Cihad Tatar<sup>3</sup>, Ishak Aydın<sup>4</sup>, Ramazan Kozan<sup>5</sup>, Ali Cihat Yıldırım<sup>6</sup>, Cemil Burak Kulle<sup>7</sup>, Taner Kivılcım<sup>8</sup>, İbrahim Ethem Cakcak<sup>9</sup>, Serkan Zenger<sup>10</sup>, Yusuf Sevim<sup>11</sup>, Sezgin Zeren<sup>12</sup>, Erdinç Kamer<sup>13,14</sup>

<sup>1</sup>Koç University School of Medicine, Department of General Surgery, İstanbul, Turkey

<sup>2</sup>İstanbul Medipol University, International Faculty of Medicine, Department of General Surgery, İstanbul, Turkey

<sup>3</sup>Acıbadem Taksim Hospital, Department of General Surgery, İstanbul, Turkey

<sup>4</sup>Çukurova University Faculty of Medicine, Department of General Surgery, Adana, Turkey

<sup>5</sup>Gazi University Faculty of Medicine, Department of General Surgery, Ankara, Turkey

<sup>6</sup>Kütahya Health Sciences University Faculty of Medicine, Department of General Surgery, Kütahya, Turkey

<sup>7</sup>İstanbul University, İstanbul Faculty of Medicine, İstanbul, Turkey

<sup>8</sup>İstanbul Okan University Faculty of Medicine, Department of General Surgery, İstanbul, Turkey

<sup>9</sup>Trakya University Faculty of Medicine, Department of General Surgery, Edirne, Turkey

<sup>10</sup>VKF American Hospital, Department of General Surgery, İstanbul, Turkey

<sup>11</sup>University of Health Sciences Turkey, Kayseri Faculty of Medicine, Kayseri City Hospital, Department of General Surgery, Kayseri, Turkey

<sup>12</sup>Kütahya Health Sciences University Faculty of Medicine, Department of General Surgery, Kütahya, Turkey

<sup>13</sup>University of Health Sciences Turkey, İzmir Faculty of Medicine, Department of General Surgery, İzmir, Turkey

<sup>14</sup>İzmir State Hospital, Department of General Surgery, İzmir, Turkey

## ABSTRACT

**Aim:** This nationwide survey study aimed to determine the initial and definitive treatment strategies for pilonidal abscess (PA) that are used by general surgeons in Turkey.

**Method:** Surgeons working at centers in Turkey were sent an electronic questionnaire focusing on diagnostic, perioperative, and postoperative management options for PA. The questions were prepared based on an extensive assessment of the literature and were evaluated for usability prior to distribution. A survey consisting of 20 questions was sent to surgeons and surgical residents via email. The survey link was kept active for 1 month to give the surgeons enough time to complete it.

**Results:** Of the 520 participants, 64% defined themselves as general surgeons and 9.5% as colorectal surgeons. The most preferred surgical approaches among the participants were as follows: day surgery unit (75.2%), local anesthesia (82.8%), and drainage through the most fluctuant location (65.1%). Irrigation of the cavity was applied by 70% of the participants (38.8% with saline and 32.3% with hydrogen peroxide). The majority (82.5%) prescribed oral antibiotics following PA drainage. Definitive treatment was scheduled within a timeframe of 4-8 weeks by 45.6%. Participants who performed concurrent phenol application were more likely to perform a definitive treatment if the patient becomes symptomatic ( $p < 0.001$ , odds ratio: 10,819, 95% confidence interval: 2,682-43,645).

**Conclusion:** The study revealed that there are different approaches to the management of PA among surgeons in Turkey. Guidelines and consensus studies should be conducted to achieve the best results in the management of PA.

**Keywords:** General surgery, management, pilonidal abscess, surgeon approach, treatment



Address for Correspondence: İbrahim Halil Özata, MD,  
Koç University School of Medicine, Department of General Surgery, İstanbul, Turkey  
E-mail: iozata@ku.edu.tr ORCID ID: orcid.org/0000-0001-6749-8518  
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## Introduction

Pilonidal disease (PD) is an inflammatory condition arising from a foreign-body reaction triggered by the ingrowth of hairs in the gluteal cleft or their migration to this area from elsewhere in the body. Although it was previously categorized as congenital, PD is now regarded as acquired.<sup>1</sup>

The disease can be present in various forms: asymptomatic, as a simple cyst, an acute abscess accompanied by cellulitis, or as chronic discharging sinuses.

Approximately 60% of patients present with an acute abscess that may be accompanied by cellulitis.<sup>2</sup> More than half of these patients benefit from simple incision and drainage. Symptoms persist after the initial drainage in the remaining half, necessitating definitive surgery.<sup>3-5</sup> There is no consensus on the optimal pilonidal abscess (PA) treatment, with treatment options varying from needle aspiration to wide cyst excision.<sup>2-5</sup> Some authors endorsing excision or cyst unroofing with curettage or the lay-open technique<sup>4,6</sup> advocate the single-step approach with curative intent. Others aim to convert the emergency into an elective procedure by aspirating PA with a needle or draining it through a small incision.<sup>3,5</sup> Limited studies have also been published regarding endoscopic pilonidal sinus treatment (EPSIT), considered a single-step approach with low recurrence rates.<sup>6-8</sup>

Results related to the initial approach to PA are generally derived from studies that also include chronic PD, and limited data focuses solely on acute conditions. Guidelines and consensus reports from key associations on the best approach for PA are based on the limited literature available.<sup>9-12</sup>

This study aims to identify the preferred treatments for PA among general surgeons in Turkey. The secondary aims are to identify strategies for postoperative follow-up (e.g., antibiotic use and wound care) and definitive treatment (e.g., timing and procedure). The results of this survey will be crucial in determining the approach of surgeons in Turkey to managing PA and laying the groundwork for a series of planned future studies.

## Materials and Methods

### Survey

The study protocol was approved by a İstanbul Medipol University National Ethical Committee (approval no: 727, date: 31.08.2023). An electronic survey was created using SurveyMonkey<sup>13</sup> (<https://surveymonkey.com>), and the study's steering committee determined the questions. Prior to creating the questionnaire, the steering committee conducted a comprehensive 10-year literature review, searching databases (e.g., Embase, MEDLINE, Web of Science, PubMed, and Cochrane Library) following the Checklist for Reporting

Results of Internet E-Surveys statement.<sup>14</sup> Publications in English were considered, and the steering committee tested the usability and technical functionality of the survey.

The questionnaire consisted of 20 questions, and it took approximately 4 minutes to complete. The first question requested consent, and questions 2-7 gathered personal information, job titles, surgical interests, and the yearly quantity of PD procedures conducted by the participants. Questions related to disease diagnosis (question 8), perioperative strategy (questions 9-13), surgical treatment choices (questions 13, 14), antibiotic administration (questions 15-17), postoperative management (question 19), and preference for permanent treatment (question 20) were included.

The survey, designed as a closed survey, was distributed via email to 1,860 members of the Turkish Surgical Association (TSA), comprising surgeons and surgery residents. The participants' email addresses were obtained through the TSA. The survey was conducted voluntarily, and no incentives were offered to the participants. Upon registration for the survey, the participants provided their names and email addresses, which were subsequently recorded in the system. This was used for identification purposes. The estimated time to complete the survey, the researchers' identities, and the study's aims were provided on the introduction page of the survey. All questions were on a single page, and the participants could review and change their responses before finishing. Cookies were used to assign a unique user ID to each participant's computer to prevent repeated entries. The data were collected between August 8 and September 8, 2023. Three reminder emails were sent to non-responders at one-week intervals after the first email.

Retired surgeons, participants who did not complete all survey questions, and those who did not indicate their consent were excluded from the analysis.

### Statistical Analysis

The data were analyzed based on sociodemographic characteristics and variables associated with the responses. The response percentages were calculated by dividing the number of participants for each response by the total number of replies received for that question. Continuous data were summarized using means and standard deviations, whereas categorical variables were examined using proportions. Pearson's chi-squared test was used to compare categorical data across groups. Dummy variables were created, and logistic regression was performed using a stepwise variable selection technique. Three models were constructed using the data, with each model corresponding to one of the answers provided in the previously mentioned question. All database variables, encompassing the dependent variables, were treated as dummy variables. The categories for each variable

were grouped to ensure an adequate sample size. Due to the dichotomization of the dependent variables through the grouping procedure, explanatory variables were selected based on the Akaike information criterion using a logistic stepwise regression model. Considering the many tests conducted, p-values below 0.05 were carefully assessed to address the potential risk of false positives.

## Results

### Demographic and Occupational Characteristics

Table 1 provides an overview of the demographic and occupational characteristics of the participants. Out of the 520 participants meeting the inclusion criteria, the majority (82.3%) were men, with a wide age distribution, with a significant proportion notably falling between 31 and 40 years old (31.9%). In terms of professional roles, almost half were attending surgeons (47.8%), and a substantial portion worked in university or training and research hospitals, representing 55.6% of the settings. Most participants identified themselves primarily as general surgeons (64%).

### Surgical Approach

Table 2 details the surgical methods used. Regarding yearly PA drainage, 36.9% of the participants reported draining over 30 abscesses. Almost all of the participants (99.2%) relied on physical examination for diagnosis, with 75.2% preferring the day surgery unit. Local anesthesia was the most favored approach (82.8%), with short- and fast-acting local anesthetics being the top choices (80.8%).

Drainage of PA from the most fluctuant location was the preferred approach for 65.1% of the participants. When irrigating the cavity following abscess drainage, 38.8% of the surgeons used normal saline, and 32.3% used hydrogen peroxide. Additionally, 62% of the surgeons chose to perform incision and drainage as a standalone treatment without further therapies.

### Postoperative Care

Table 3 presents a detailed analysis of the postoperative treatment and follow-up procedures in PA management. Most surgeons (82.5%) prescribed oral antibiotics following PA drainage, with a smaller percentage combining oral and local antibiotics (8.7%), or opting not to use antibiotics at all (7.3%). Regarding antibiotic preference, 75.2% of the participants chose anti-aerobic and anti-anaerobic antibiotics. Regarding the timing for definitive treatment following PA drainage, the largest group (45.6%) recommended a window of 4-8 weeks.

Concerning the initiating of antibiotic treatment, 73.1% reported routinely using antibiotics, whereas 24.2% were influenced by deep surgical infection or cellulitis. Over half of

the participants (56.5%) recommended changing the dressing once a day for wound care (Table 4).

### Question-Based Stepwise Regression

A stepwise regression analysis was conducted to determine whether surgeons who expressed a high level of adherence to a specific treatment in some questions also demonstrated a similar tendency toward treatment approaches in other questions. Significant results from the questions (Q) and subsequent answers (A) using the stepwise regression model are provided in the appendices.

**Table 1.** Demographic and occupational characteristics of the participants

	n	%
<b>Q2: Age</b>		
20-30	77	14.4
31-40	171	31.9
41-50	130	24.3
51-60	83	15.5
61-70	49	9.1
71-80	10	1.9
<b>Q3: Gender</b>		
Woman	77	14.4
Man	441	82.3
Other	0	0
<b>Q4: Academic position</b>		
Resident	114	21.3
Attending surgeon	256	47.8
Assistant professor	37	6.9
Associate professor	62	11.6
Professor	51	9.5
<b>Q5: Setting</b>		
University hospital	109	20.3
Training and research hospital	189	35.3
State hospital	109	20.3
Private hospital	88	16.4
Private office	22	4.1
<b>Q6: Specialty</b>		
Breast and endocrine surgeon	71	13.2
Bariatric and metabolic surgeon	9	1.7
Hepatobiliary surgeon	7	1.3
Gastrointestinal surgeon	39	7.3
Colorectal surgeon	51	9.5
General surgeon	343	64

**Table 2.** Surgical approaches

	n	%
<b>Q7: How many PAs do you drain in one year?</b>		
0-10	104	19.4
11-20	127	27.3
21-30	91	17
>30	198	36.9
<b>Q8: What do you use in the diagnosis of PA?</b>		
Medical history	207	39.8
Physical examination	516	99.2
Ultrasound	54	10.4
MRI or CT	18	3.5
<b>Q9: Where do you usually drain PA?</b>		
Office	138	25.7
Day surgery unit	403	75.2
Operation room	177	33
<b>Q10: What is your preferred analgesia/anesthesia method for PA drainage?</b>		
Local anesthesia	444	82.8
General anesthesia	23	4.3
Spinal/regional anesthesia	95	17.7
Local anesthesia with sedation	104	19.4
Other	7	1.3
<b>Q 11: Which of the followings do you prefer for local anesthesia?</b>		
Short- and rapid-acting local anesthetics	433	80.8
Long- and slow-acting local anesthetics	42	7.8
Local anesthetic ointments	7	1.3
Combination of rapid- and slow-acting anesthetics	69	12.9
Cold spray	43	8
I do not use local anesthetics	21	3.9
<b>Q12: What is your preference for the incision location for PA drainage?</b>		
The most fluctuant location	349	65.1
Close to midline	76	14.2
Lateral	48	9
Enlarging the existing pit or connect it with other pits	41	7.6
<b>Q13: How do you treat PA?</b>		
Incision and drainage	64	11.9

**Table 2.** continued

	n	%
Incision, drainage, and irrigation with serum physiologic	208	38.8
Incision, drainage, and irrigation with hydrogen peroxide	173	32.3
Incision, drainage, and irrigation with povidone iodine	76	14.2
Other	5	1
<b>Q14: Do you apply any concurrent treatments during PA drainage?</b>		
No, only incision and drainage	323	62.1
Unroofing and drainage	135	26
Drainage and phenol (crystalized or liquid) application	68	13.1
Drainage and laser ablation	4	0.8
Drainage and EPSIT	3	0.6
Other	5	1

PA: Pilonidal abscess, MRI: Magnetic resonance imaging, CT: Computed tomography, EPSIT: Endoscopic pilonidal sinus treatment

Those that may be important in clinical practice are listed below.

Participants who typically performed PA drainage in the operating room (Q9) showed a significant preference for concurrent unroofing with PA (Q14) ([Appendix 1.1](#)). The surgical approach of “incision, drainage, and irrigation with hydrogen peroxide” (Q13) was significantly associated with concurrent unroofing (Q14) ([Appendix 1.2](#)). Furthermore, participants who perform concurrent phenol application with PA drainage (Q14) are more inclined to administer definitive treatment if the patient is symptomatic (Q20) ([Appendix 1.3](#)). Additionally, the choice of “local antibiotic application and closed dressing with sterile gauze or sponge” for dressing type (Q19) was significantly correlated with the surgical approach of “unroofing, incision, drainage, and irrigation with hydrogen peroxide” (Q13) ([Appendix 1.4](#)).

## Discussion

This study sheds light on the preferred approaches of surgeons in Turkey regarding managing PA, which are briefly mentioned in guidelines but still present unresolved issues in the literature.<sup>9-12</sup> These unsolved problems are as follows: the initial treatment of PA (incisional or excisional), the timing of definitive treatment (concurrent with abscess drainage or delayed, and if delayed, by how long), and the role of antibiotics in treatment. The survey findings indicated that one-third of the participants favored unroofing over simple incision and drainage for treating PA. Additionally, 16%

**Table 3.** Approaches to postoperative care and follow-up

	n	%
<b>Q15: What is your practice regarding the use of antibiotics after PA drainage?</b>		
Oral antibiotics	429	82.5
Local antibiotics	6	1.2
Oral and local antibiotics	45	8.7
I do not use antibiotics	38	7.3
<b>Q16: Which antibiotics do you prefer?</b>		
Anti-aerobic	47	9
Anti-anaerobic	39	7.5
Both aerobic and anti-anaerobic	391	75.2
I do not use antibiotics	32	6.2
Other	4	0.7
<b>Q17: What is the primary factor that influences your tendency to initiate antibiotics?</b>		
I routinely use antibiotics	380	73.1
Presence of deep surgical infection or cellulitis	126	24.2
Atypically located abscess	28	5.4
Regarding culture result	23	4.4
Immune deficiency	61	11.7
Comorbidity (diabetes, COPD, etc.)	84	16.2
Other	1	0.2
<b>Q18: What is your approach to wound care following PA drainage?</b>		
Changing the dressing once a day	294	56.5
Changing the dressing twice a day	71	13.7
Changing the dressing when it gets wet	132	25.4
I do not recommend dressing	18	3.5
Other	4	0.7
<b>Q19: What kind of dressing do you recommend after PA drainage?</b>		
Cleaning with povidone iodine and closed dressing with sterile gauze or sponge	289	55.6
Cleaning with serum physiologic and closed dressing with sterile gauze or sponge	121	23.3
Washing with water and soap in the shower and closed dressing with sterile gauze or sponge	117	22.5
Local antibiotic application and closed dressing with sterile gauze or sponge	43	8.3
I do not recommend dressing	19	3.7
Other	9	1.7
<b>Q20: When do you typically recommend definitive treatment after PA drainage?</b>		
In the same session	16	3.1
<4 weeks	101	19.4
4-8 weeks	237	45.6
>8 weeks	90	17.3
When it becomes symptomatic	61	11.7
Other	11	2.1

PA: Pilonidal abscess, COPD: Chronic obstructive pulmonary disease

**Table 4.** Responses to question 17: What is the primary factor that influences your decision to start antibiotics? (multiple answers can be marked)

	n	%
I start antibiotics routinely for every patient	438	72.7
In the presence of deep surgical area infection/cellulitis	168	27.9
In atypically located abscesses	41	6.8
Based on culture results	8	5.4
In patients with immunodeficiency	84	13.9
In the presence of comorbidities (diabetes, COPD, etc.)	104	17.3
Other (please specify)	4	0.66

COPD: Chronic obstructive pulmonary disease

reported performing definitive treatment in the same session. Those who applied phenol (13%) did so with curative intent and did not plan any definitive treatment unless the patient became symptomatic again. These results are consistent with one-third of the procedures performed in the operating room. Two-thirds of the participants routinely use oral antibiotics predominantly. Almost all of the participants recommended closed dressing following the procedure.

Performing the procedure in the operating room or office setting presents advantages and disadvantages. The operating room environment may provide surgeons with the opportunity for a more aggressive and definitive approach. However, there is limited data in the literature comparing simple incision and drainage with excision or unroofing. In a randomized controlled trial involving 150 patients comparing simple incision and drainage with unroofing, the latter demonstrated superiority, exhibiting a higher complete healing rate at 10 weeks (96% vs. 79%,  $p=0.001$ ) and a lower recurrence rate at 65 months of follow-up (11% vs. 45%,  $p=0.001$ ).<sup>4</sup> Another study by Garg et al.<sup>5</sup> reported a cure rate of 97% with unroofing along with curettage. Although guidelines recommend incision and drainage followed by delayed elective surgery following the resolution of inflammation,<sup>9,11</sup> a meta-analysis documented a pooled recurrence rate of 4.47% (95% confidence interval: 0.029-0.063) following unroofing, debridement, and open treatment for both chronic PD and PA, which appears favorable compared with incision and drainage.<sup>15</sup>

The results concerning the initial approach to PA are predominantly derived from studies that also encompass chronic PD, with limited data focusing solely on acute conditions. Even fewer studies address the necessity and timing of definitive surgery following the initial approach. In a prospective randomized study, 102 patients presenting with PA were divided into 2 groups: the first underwent simple drainage followed by excision and primary closure 3 weeks later, and the second group received excision and was left for secondary healing.<sup>16</sup> The group undergoing simple drainage

exhibited a higher rate of recurrent abscess at 12 months of follow-up (14% vs. 0%,  $p<0.05$ ) and a greater recurrence rate (42% vs. 11%,  $p<0.05$ ).<sup>16</sup> Matter et al.<sup>6</sup> compared wide excision and simple drainage in 58 patients with PA and found recurrence rates of 55% and 41%, respectively, after a median follow-up of 6 years ( $p>0.05$ ). Another retrospective study of 57 patients with a 4-year follow-up reported recurrence rates of 19% and 54% following wide excision-lay open and incision-drainage, respectively ( $p<0.05$ ). However, the excision group exhibited unfavorable outcomes in terms of time needed to return to work and wound healing. Despite being small series, the high recurrence rates in these studies with long follow-up periods indicate that performing definitive wide excision in the same session does not offer an advantage, and 19%-50% of patients required elective intervention.<sup>6</sup> In our survey, surgeons who preferred to drain PA in the operating room demonstrated a higher tendency toward a curative approach in the same session. The necessity and cost-effectiveness of this approach, along with its impact on post-procedural return to work, pain management, and quality of life, remain unclear and warrant further evaluation.

Studies involving a small number of patients regarding the role of minimally invasive techniques in PA treatment have compared simple incision and drainage with endoscopic PA treatment, demonstrating faster wound healing with endoscopic treatment (16 vs. 35 days,  $p=0.0018$ ). However, the eventual need for definitive surgery was similar in both groups.<sup>7,8</sup> Only 1% of the surgeons participating in our survey employ treatments such as laser and EPSIT concurrently.

In chronic PD surgery, excisional methods with off-midline techniques are considered the gold standard. However, there is insufficient data regarding approaches to abscess drainage.<sup>10-12</sup> The optimal site for draining a PA remains unclear: some authors recommend a lateral incision, others suggest a cruciform incision, and some remain undecided.<sup>17</sup> Making a longitudinal off-midline incision is recommended based on anecdotal evidence, suggesting that midline wounds tend to

heal more slowly.<sup>17,18</sup> Conversely, some authors argue that an incision along the midline is more effective, as it directly targets the primary area affected by the disease.<sup>19</sup> In their study comparing PA drainage through midline and lateral incisions in 242 patients, Webb and Wysocki<sup>20</sup> demonstrated that abscesses drained from the midline had an average healing duration of 3 weeks longer. Most participants in our survey stated that they drained the PA from the most fluctuant location. A small portion preferred enlarging the existing pit or connecting it with other pits, which should be the subject of future studies.

Regarding the approach of delayed definitive treatment, half of the surgeons participating in the survey opt to do this between 4 and 8 weeks. Guidelines recommend definitive treatment once the inflammation heals.<sup>11</sup> The wound healing time was 1-120 days after simple incision drainage and 1-3 months after excision.<sup>21</sup> The optimal timing for undertaking definitive treatment remains a subject of debate. An important consideration is whether clinicians should delay definitive intervention until complete wound healing or resolution of infection. The available data to guide these decisions are insufficient, and further studies are needed. Phenol application is a widely practiced method in treating PD in Turkey. PD accompanied by an acute abscess is typically regarded as a criterion for exclusion in studies involving the application of phenol.<sup>22,23</sup> However, the literature suggests that phenol application simultaneously with abscess drainage yields acceptable results.<sup>24,25</sup>

Logistic regression results from our survey revealed that surgeons who utilize phenol (13%) during PA drainage typically do not plan further treatment if the patient remains asymptomatic. The potential for phenol treatment to yield definitive outcomes when administered alongside PA drainage warrants further exploration in prospective studies.

The use of antibiotics after draining a PA is a widely adopted approach,<sup>26,27</sup> targeting the common bacteria responsible for abscess formation.<sup>28</sup> In our survey, two-thirds of the participants routinely administered antibiotics, preferring oral aerobic and anti-anaerobic options. However, there is a need for studies specifically focusing on PA to evaluate the prophylactic or maintenance use of antibiotics and the optimal duration of their administration.

A great number of surgeons in Turkey continue to employ interventions such as irrigating wounds with hydrogen peroxide (26%) and using closed dressings with local antibiotics (8.3%). This is despite the lack of evidence supporting their beneficial impact on wound healing.<sup>29-31</sup> Our logistic regression analysis indicates that surgeons who irrigate wounds with hydrogen peroxide are more likely to apply dressings with local antibiotics. Although intraoperative hydrogen peroxide irrigation has been associated with a reduced risk of surgical site

infection in orthopedic procedures,<sup>32</sup> guidelines advise against its use due to its adverse effects on wound healing. The daily practices of surgeons in Turkey diverge from recommendations supported by existing literature. Establishing a nationwide comprehensive prospective database and conducting studies to evaluate the impact of hydrogen peroxide application on healing following PA drainage would be beneficial.

### Study Limitations

Our participants included very few colorectal surgeons, half did not work in teaching hospitals, and fewer than a third were academics. Therefore, our study is significant in reflecting the real-world situation in the field. Approximately 80% of the participants drained 10 or more PAs, a substantial indicator of its prevalence in Turkey.

However, the survey might not have reached every practicing surgeon. Since it was conducted via closed email, we only reached our target audience, and it was not randomly shared on social media. Although the participants are fairly heterogeneous, they represent the desired target audience. There were no questions or evaluations related to the quality of life. The survey was not open to patient participation and provided no information about patient-reported outcome measures.

### Conclusion

Turkey is one of the countries where PD is most prevalent,<sup>33</sup> and surgeons frequently encounter PA in their daily practice. The results of this survey indicate that surgeons in Turkey should be encouraged to adhere to the guidelines for the treatment of PD. If they achieve favorable outcomes through alternative approaches, they should contribute to the literature by documenting their experiences.

In conclusion, neither studies nor PD guidelines fully address the challenges encountered in clinical practice. It may be advisable to consider PA as a distinct entity separate from chronic PD, warranting specialized studies of its own. We believe that the current gap in this field should be addressed by surgeons in Turkey documenting their experiences in approaching PA through well-designed randomized controlled trials.

### Ethics

**Ethics Committee Approval:** The study protocol was approved by a İstanbul Medipol University National Ethical Committee (approval no: 727, date: 31.08.2023).

**Informed Consent:** Retrospective study.

### Authorship Contributions

Surgical and Medical Practices: İ.H.Ö., Ç.A., S.N.K., C.T., I.A., R.K., A.C.Y., C.B.K., T.K., İ.E.C., S.Z., Y.S., S.Z., E.K., Concept: İ.H.Ö., Ç.A., Design: İ.H.Ö., Ç.A., C.T., I.A., R.K., A.C.Y.,

C.B.K., T.K., İ.E.C., S.Z., Y.S., S.Z., E.K., Data Collection or Processing: İ.H.Ö., Ç.A., S.N.K., Analysis or Interpretation: İ.H.Ö., Ç.A., S.N.K., Literature Search: Ç.A., C.T., İ.A., R.K., A.C.Y., C.B.K., T.K., İ.E.C., S.Z., Y.S., S.Z., Writing: İ.H.Ö., Ç.A., S.N.K., E.K.

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