Management of isolated deep postanal space suppuration via posterior sphincterotomy

Walid M. Abd El Maksoud[a], Mohamed Mazloum Zakareya[b], Ahmed D. Mohii[c]

[a]Associate Professor, Colorectal Surgery Unit, General Surgery Department, Faculty of Medicine, Alexandria University, Alexandria, Egypt, [b]Professor of Surgery, Chairman of Colorectal Surgery Unit, General Surgery Department, Faculty of Medicine, Alexandria University, Alexandria, Egypt, [c]Assistant Lecturer, Colorectal Surgery Unit, General Surgery Department, Faculty of Medicine, Alexandria University, Alexandria, Egypt

Correspondence to Walid Abd El Maksoud, Associate Professor, Colorectal Surgery Unit, Department of General Surgery, Faculty of Medicine, Alexandria University, Alexandria, 21526, Egypt. ORCID account for Walid M. Abd El Maksoud (0000-0002-2861-6611). Mob: 00201 211433351; fax:00203 5910720; e-mail: dr.waleedmaksoud@gmail.com

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Aim
The aim of this study was to evaluate the treatment of isolated deep postanal space (DPS) suppuration, using the posterior midline approach in terms of recurrence and post-drainage fistula formation.
Patients and methods
The study included 16 patients (13 men and three women) with isolated DPS suppuration without clinical or radiological evidence of extension. DPS affection was demonstrated by bidigital examination and preoperative MRI. All patients were managed by the posterior sphincterotomy approach performed by senior colorectal surgeons.
Results
Patients complained for a mean period of 23.75±19.43 days before seeking medical advice. There was great variability between duration in patients complaining of acute pain only (6.80±2.28 days) and chronic discharge only (31.40±14.09 days). Recurrence was encountered in two (12.5%) patients in the form of recurrent abscess (6.25%) that developed 3 months after the first drainage and anal fistula (6.25%) that developed 4 months postoperatively. Patients in the study reported satisfactory results with regard to postoperative continence after 3 months. These results showed further improvement at 6 and 12 months.
Conclusion
Isolated DPS suppuration should be managed with a senior colorectal surgeon. Without awareness of the problem and a clear understanding of anatomy, it is impossible to achieve successful treatment of the isolated DPS suppuration. Management of isolated DPS by the posterior sphincterotomy approach seems to be a successful technique with low recurrence rate and satisfactory postoperative continence status.

Keywords:
deep post anal space, perianal suppuration, posterior sphincterotomy

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Introduction

Perianal suppuration, defined as a collection of pus located in the perineal tissue, is considered the most common proctologic disorder that necessitates emergent surgical intervention [1,2]. It is most commonly cryptoglandular in origin [3]. Clinically, perianal suppuration presents in the form of perianal abscesses, anal fistulas, or in 30–70% of patients a combination of both [4]. Anorectal abscesses are generally considered simple surgical problems that are easy to diagnose and manage. Consequently, they are usually managed by nonspecialized surgeons [5].

The location of the anorectal abscess greatly determines its clinical presentation [3]. Most anorectal abscesses are of the perianal type (60%) or ischiorectal type (35%). Both have clear perineal presentations and visible signs, so they are easy to be diagnosed and managed [6].

Deep postanal space (DPS) is one of those deep locations in which suppuration will lead to a challenging clinical problem for either correct diagnosis or treatment. The DPS was traditionally described by Courtney [7] in 1949 to be located posterior to the external sphincter at the junction of both ischiorectal fossae. However, in 2006, Kurihara *et al.* [8] made a dramatic change in the concept of DPS by introducing their new description of its anatomy to lie within the deep part of the external sphincter in the intersphincteric space. They claimed that DPS is that space which lies in the posterior portion of the central anal region surrounded by the musculature. Anatomically, the DPS is bound anteriorly by the posterior aspect of the deep external sphincter,

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superiorly by the levator ani which inserts into the fourth sacral and first coccygeal bodies by way of the anococcygeal raphe, and inferiorly by the superficial external sphincter as it inserts into the tip of the coccyx via the anococcygeal ligament [9].

According to this new anatomical concept, DPS is now accused of the creation of the notorious horseshoe fistula [10]. Isolated DPS suppuration is an uncommon condition that presents with either acute deep anal pain or abnormal chronic passage of pus per anus when the pus is partially drained through a posterior midline opening leading to subsidence of pain [2]. Most of the described treatment procedures concentrate on the management of DPS associated with horseshoe fistulas rather than isolated DPS abscess [10–12]. In addition, the paucity of cases led to lack of uniform guidelines for the management of this condition [4].

The aim of this study was to evaluate the treatment of isolated DPS suppuration, using the posterior midline approach in terms of recurrence and post-drainage fistula formation.

Patients and methods

This is a prospective study that included all patients complaining of isolated DPS suppuration, who were admitted to the Colorectal Surgery Unit, Alexandria Main University Hospital during the period from February 2014 to October 2017.

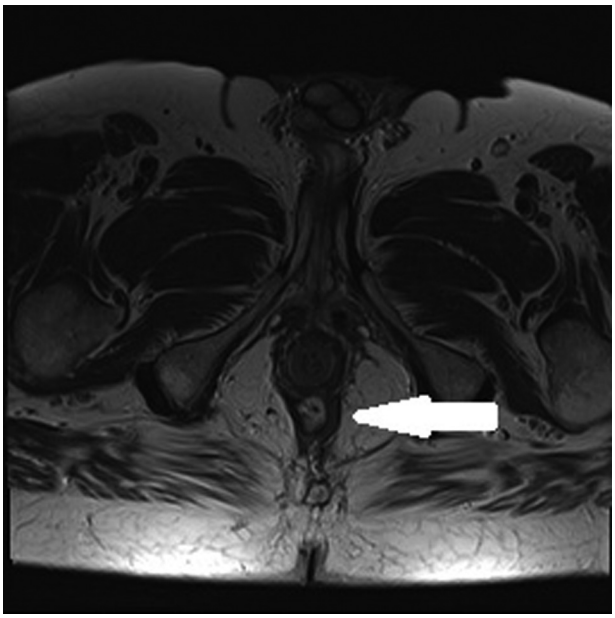
Inclusion criteria: patients with isolated DPS suppuration with no clinical or radiological evidence of extension. DPS affection was demonstrated by bidigital examination and preoperative MRI. Exclusion criteria comprised patients who developed lateral extensions proved by MRI preoperatively or by intraoperative examination, patients with recent previous anal surgery for anal suppuration within the last 3 months and patients with perianal suppuration of noncryptoglandular origin (e.g. inflammatory bowel disease).

Preoperative workup

All patients were subjected to the following: full history taking, thorough clinical examination, and preoperative MRI (Fig. 1) to demonstrate the DPS suppuration. Routine preoperative laboratory investigations and preoperative assessment of continence status were assessed using the Wexner score [13].

Informed consent was obtained from all patients regarding the surgical procedure and participation in the study.

Figure 1



MRI showing deep postanal space affection.

Operative workup

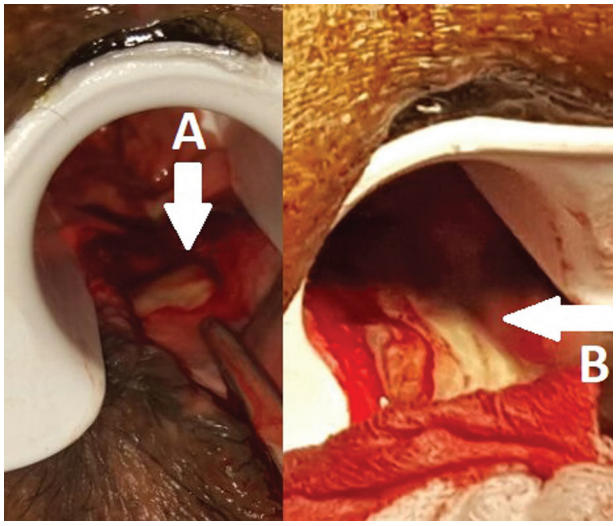
All surgical operations were performed by consultants in colorectal surgery with good understanding of the anatomy of the DPS. All operations were performed under general anesthesia, while the patient is in the lithotomy position.

The procedure starts by identification of the internal opening that is usually palpated in the posterior midline and is located on the lower rim of the puborectalis shelf with some woody sensation of the puborectalis sling. The internal opening is usually present; however, it will be obliterated in patients present with an acute abscess and opened with pus discharging out of it in patients with chronic presentation of pus discharge. This is followed by the insertion of the anal dilator to clear up the posterior midline from the verge to the internal opening for possible visualization of pus coming out from the internal opening and facilitation of the next steps of the operation. A probe is gently inserted in the DPS through the internal opening to assess the accuracy of its identification and the depth of the space. Then widening of the internal opening is achieved by means of a blunt artery forceps (Fig. 2). This is followed by evacuation of pus (Fig. 3). Diathermy is then used to slit the tissues from outside the verge to the internal opening. The first layers to be slit are the mucosa, the submucosa, and the internal sphincter. The fibers of the superficial part the external sphincter then appearing in the view. Partial cutting of that part of the external sphincter (half thickness especially near the internal opening) is done in almost a straight line for better

Figure 2

A blunt forceps is inserted in the deep postanal space through the internal opening.

Figure 3



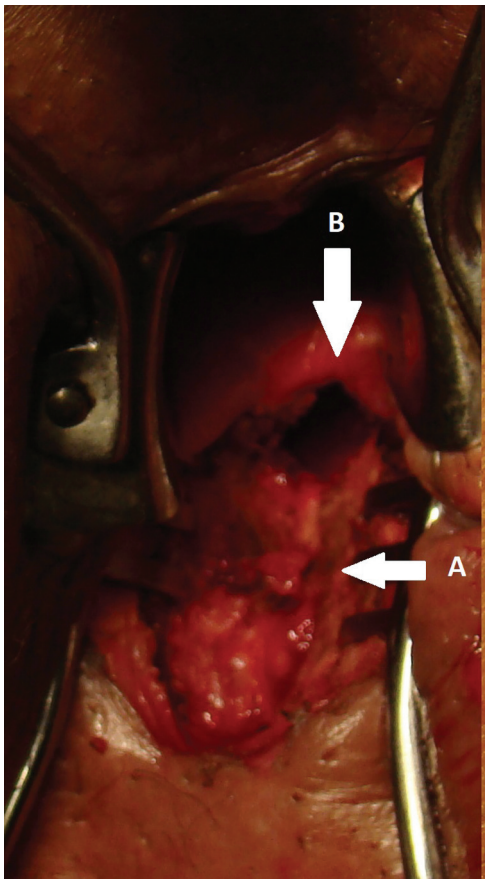
(a) Removal of the forceps after gentle widening of the internal opening and (b) drainage of the pus out of the deep postanal space.

drainage of the abscess cavity. Cutting over the lower aspect of the internal opening will open the primary lesion from below (Fig. 4), enabling the insertion of a curette to evacuate the granulation tissue. Then, the wound is scrutinized for possible side tracts or extensions to supra-levator, inter-sphincteric, or para-rectal spaces. The abscess cavity is packed for hemostasis, then the pack is removed after soaking with warm water after 12 h.

Postoperative workup

Patients were discharged within 24 h provided there were no complications. Metronidazole and ciprofloxacin were prescribed postoperatively for 5 days. Patients were followed up after 2 weeks to detect early postoperative complications. Further follow-up visits were scheduled after 3, 6, 12, and 24 months postoperatively during which patients were examined clinically to detect recurrence and

Figure 4



(a) Partial cutting of the superficial part of the external sphincter in a straight line using diathermy and (b) deep postanal space after posterior sphincterotomy.

fistula formation. Also, the Wexner score [13] was recorded after 3, 6, and 12 months for the patients to evaluate their continence status compared with the preoperative status.

Outcomes

Primary endpoints

(1) Recurrence (abscess recurrence or fistula formation) which was detected by the surgeon in the outpatient clinic at 3, 6, 9, 12, and 24 months after the operation.

Secondary endpoints

(1) Continence status reassessment in comparison with the preoperative status using Wexner score [13] to be reported by the surgeon at 3, 6, and 12 months after the surgery during the outpatient clinic visits.

The statistical analysis of data was done using the Statistical Package for the Social Sciences (SPSS version 25; SPSS Inc., Chicago, Illinois, USA).

Descriptive statistics were applied (frequency and percentage for categorical variables and mean and SD for quantitative variables). Mann–Whitney *U*-test was applied to test the differences in Wexner Score mean values postoperatively. A statistically significant difference was considered at *P* values less than 0.05.

The manuscript was written in accordance with items of the PROCESS checklist [14].

The research was approved by the Institutional Research Board of College of Medicine, Alexandria University (IRB 00007555) and precautions were taken to conceal the identity of patients.

Results

The study included 16 patients (13 male patients and three female patients) with the diagnosis of isolated DPS suppuration, who underwent drainage through the posterior midline approach. The age of patients ranged from 29 to 57 years, with a mean of 41.69±9.24 years.

Patients complained for a mean period of 23.75±19.43 days before seeking medical advice. The main presentations for the patients were anal pain, pus discharge or combined pain and pus discharge. There was great variability between the duration in patients complaining of acute pain only (6.80±2.28 days) and discharge only (31.40±14.09 days). Demographic and clinical data of the patients are shown in Table 1.

Throughout 24 months of follow-up, recurrence was encountered in two patients (12.5%) in the form of recurrent abscess (6.25%) and anal fistula (6.25%). The recurrent abscess developed 3 months after the first drainage. The patient refused any further management and he was missed in the follow-up. On the other hand, the fistula developed 4 months postoperatively. It was a superficial posterior fistula that was treated successfully by the lay open procedure. Regarding postoperative Wexner score, our patients reported satisfactory results with regard to postoperative continence after 3 months. These results showed further improvement at 6 and 12 months. Wexner scores of our patients are shown in Table 2.

Table 1 Demographic and clinical data of the studied group

	Studied group (*N*=16) [*n* (%)]
Age (years)	
Range	29–57
Mean	41.69
SD	9.24
Sex	
Males	13 (81.25)
Females	3 (18.75)
BMI (kg/m^2)	
Range	23.83–41.80
Mean	32.15
SD	4.99
Smoking	
Smoker	4 (25)
Ex-smoker	2 (12.5)
Nonsmoker	10 (62.5)
Comorbidities	
Diabetes mellitus	3 (18.75)
Hypertension	2 (12.5)
Immunosuppression	0
Presentations	
Anal pain	5 (31.25)
Discharge per anus	5 (31.25)
Combined pain and discharge	6 (37.50)
Duration of symptoms (days)	
Range	4–67
Mean	23.75
SD	19.43

Table 2 Postoperative Wexner score for patients included in the study

	Wexner score	*P* value
After 3 months (*n*=16)		
Range	1–5	
Mean	2.38	
SD	1.45	
After 6 months (*n*=14)[a]		
Range	0–2	**0.002**
Mean	0.88	
SD	0.89	
After 12 months (*n*=14)[a]		
Range	0–2	0.098
Mean	0.38	
SD	0.62	

[a]After exclusion of recurrent cases. Bold values indicate statistical significance ($P<0.05$).

Discussion

DPS has been a matter of controversy for a long time [7,10]. Although many authors reported descriptions of the DPS and its relation with perianal suppuration, especially the horseshoe fistulas [8,10,11], others reported that they could not even define a specific retrosphincteric or postanal space [15]. They stated that the nomenclature DPS is not used in Europe and is redundant from their point of view.

On the basis of our clinical and radiological experience, we agree with the description of DPS reported by

Kurihara *et al.* [8]. We think that DPS is an existing type of perianal suppuration that is really difficult to be diagnosed. Those who are trying to identify the DPS in cadavers could miss it as the space is normally collapsed and filled with loose areolar tissue [8]. However, when infected, the DPS is usually filled with pus and could be identified clearly by MRI or intraoperative assessment.

The mean age of patients in our study was 41.69 years. In addition, DPS suppuration was encountered more in men (81.25%) than women (18.75%). Abracian *et al.* [16] reported that the mean age of patients with perianal suppuration is 40 years. Many authors [2,17,18] reported that the incidence of perianal suppuration is twice as high in men compared with women. Accordingly, we think that our patients suffering from DPS do not have specific demographic characteristics compared with other types of perianal abscesses.

Regarding the clinical presentation, patients in our study who presented with acute anal pain without discharge were faster in seeking medical advice (6.80 ±2.28 days) compared with those who presented with only discharge (31.40±14.09 days). We think that DPS abscess with no pus discharge may have a higher chance of being mismanaged. Due to the deep location of DPS, there will be severe clinical symptoms in the absence of external clinical signs that usually lead to an examination under anesthesia, which should be done by senior colorectal surgeons who are not available at all times or in all medical facilities. Non-awareness of the DPS may augment the problem [10].

Incorrect interventions by surgeons with low experience in this field or with no awareness of the magnitude of the problem can lead to eminently avoidable complications such as persistent or recurrent infections, and the potential progression to extrasphincteric and suprasphincteric fistulas [5].

Management of isolated DPS suppuration by drainage through the posterior sphincterotomy approach was successful in 14 out of 16 patients in our study (87.5%). Management of DPS abscesses still constitutes real challenges to colorectal surgeons worldwide [19,20]. In the literature, many procedures were described for the management of DPS suppurations such as posterior midline sphincterotomy, fistulotomy, advancement flap procedure, and seton technique [10,15,19,20]. However, all these techniques described the management of DPS associated with horseshoe fistula. Nowadays, there is a growing understanding of the relationship between horseshoe fistulas and DPS suppuration [8,10,15]. Coexistence with horseshoe fistulas makes DPS suppuration easier to diagnose and gives it the chance for thorough drainage and allowing the condition to be treated on elective basis. The paucity of reports regarding management of isolated DPS suppuration [17,21] may reflect the difficulty to understand this clinical problem, non-diagnosis, or underestimation of the magnitude of the problem.

Postoperative continence status of our patients showed very satisfactory results. These results further improved with time and were almost comparable to the preoperative status after 6 months onwards. Treatment of perianal suppuration is based on the balance between aggressiveness for radicality and preserving postoperative sphincteric function. Although posterior midline sphincterotomy and de-roofing of the abscess cavities were associated with successful management of perianal suppurations, many surgeons are uncomfortable with the division of a significant portion of the sphincters and the possibility of causing long-term incontinence [11,20,22]. This problem was not faced in our study. Some surgeons were aggressive in their management of DPS suppuration by the division of the internal sphincter and the whole superficial part of the external sphincter [10]. We believe that partial division of the superficial part of the external sphincter at the abscess site is sufficient for successful proper drainage of DPS suppuration. We had a success rate compared with them with better continence status results. Nevertheless, we agree with them that strict linear division of the sphincter is mandatory to achieve proper postoperative sphincteric healing and hence good continence status. On the other hand, some authors chose to be very conservative in the management of DPS suppuration. Tan *et al.* [20] reported their experience of the management of DPS suppuration with the intersphincteric approach without division of the sphincter. However, their success rate was 70.6% compared with 87.5% in our study.

Conclusion

Isolated DPS suppuration should be managed with a senior colorectal surgeon. Without awareness of the problem and a clear understanding of anatomy, it is impossible to achieve successful treatment of isolated DPS suppuration. Management of isolated DPS by posterior sphincterotomy approach seems to be a successful technique with low recurrence rate and satisfactory postoperative continence status.

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Nil.

Conflicts of interests
There are no conflicts of interest.

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