

## Research Article

# Treatment Outcomes of Perianal Abscess in the Children Younger Than 1 Year of Age

 Yusuf Atakan Baltrak,  Seniha Esin Sogut,  Onursal Varlikli

Department of Pediatric Surgery, Kocaeli Derince Training and Research Hospital, University of Health Sciences, Kocaeli, Turkey

### Abstract

**Objectives:** Optimal treatment of perianal abscess on the children is conflicting. The aim of the present study was to perform a retrospective research of paediatric patients below 1 year of age who were admitted into the paediatric surgery clinic due to perianal abscess and fistula-in-ano, and to present the treatment outcomes for perianal abscess and fistula-in-ano in comparison.

**Methods:** The study was conducted by screening files of the patients below 1 year of age who have been followed-up and treated because of perianal abscess and fistula-in-ano in paediatric surgery clinic of our hospital between 2015 and 2020.

**Results:** There was not any statistically significant difference in the outpatient and inpatient groups admitted due to perianal abscess for laboratory tests, abscess location, and therapeutic procedure. The most common location of PA was at 9 o'clock (n=15, 31%), 3 o'clock and 8 o'clock levels. Surgical drainage was implemented to 32 (68%) patients; 15 (32%) patients were followed-up through conservative treatment without any surgical procedure. Fistulotomy was performed on nine (19.1%) patients who have not responded to conservative treatment for two weeks. There was not any adverse event or recurrent abscess developed after fistulotomy procedure.

**Conclusion:** Although characteristics of PA and FA are well-known, treatment on the children is contradictory. Conservative treatment of PA includes sitz bath and being careful on local hygiene. Conservative treatment may be implemented on eligible paediatric patients diagnosed with PA. In the patients who do not respond to conservative treatment, sitz bath for the abscess with complete fluctuation, and basic drainage with or without topical anaesthesia are the most common therapies for perianal abscess. In addition, considerable discussions about efforts to identify a fistula during abscess drainage are involved in the literature.

**Keywords:** Conservative treatment, fistula-in-ano, fistulotomy, perianal abscess

**Cite This Article:** Baltrak YA, Sogut SE, Varlikli O. Treatment Outcomes of Perianal Abscess in The Children Younger Than 1 Year of Age. *EJMI* 2020;4(4):453–458.

Perianal abscess (PA) and fistula-in-ano (FA) are the common subsequent diseases among the infants. Although clinical characteristics of PA and FA are well-known, discussions on adequate treatment persist.<sup>[1]</sup> Symptoms of a systemic infection are rare in the children diagnosed with PA. Most cases may be treated at polyclinic conditions and hospitalization is not required. There may be progression of PA to FA in infants (Fig. 1). However, surgical treatment in

most cases does not require fistulectomy. The disease and treatment which is observed in adults and older children is different from this characteristic.<sup>[2]</sup> There is no good understanding of the detailed characteristics of fistula-in-ano and perianal abscess among the babies below 1 year of age; therefore, management of the disease is still contradictory.<sup>[3,4]</sup> It is difficult to select the treatment due to lack of a consensus on the way of curing these diseases. Standardized

**Address for correspondence:** Yusuf Atakan Baltrak, MD. Kocaeli Derince Egitim ve Arastirma Hastanesi, Saglik Bilimleri Universitesi Cocuk Cerrahisi Anabilim Dalı, Kocaeli, Turkey

**Phone:** +90 505 489 75 03 **E-mail:** dratakanbaltrak@gmail.com

**Submitted Date:** August 24, 2020 **Accepted Date:** October 01, 2020 **Available Online Date:** October 15, 2020

©Copyright 2020 by Eurasian Journal of Medicine and Investigation - Available online at [www.ejmi.org](http://www.ejmi.org)

**OPEN ACCESS** This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License.





**Figure 1.** Image of perianal abscess giving fluctuation.



**Figure 2.** Fistula ano and fistulotomy procedure.

guidelines can be created for an adequate treatment by doing further studies. The aim of the present study was to evaluate clinical features of fistula-in-ano and perianal abscess to determine the factors affecting clinical outcomes.

We aimed to perform a retrospective research of paediatric patients below 1 year of age who were followed due to perianal abscess and fistula-in-ano, and to present the treatment outcomes.

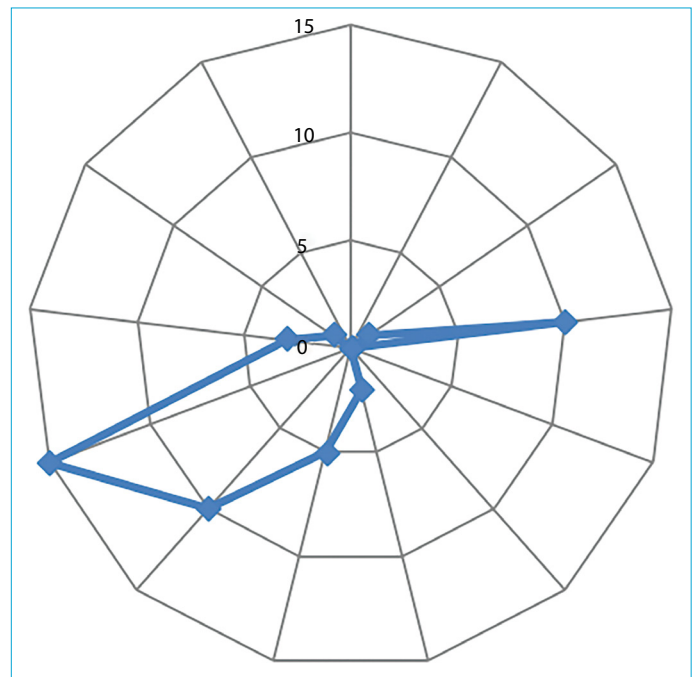
## Methods

### Study Planning

Files of the patients below 1 year of age who were followed and treated due to PA and FA in paediatric surgery clinic of our hospital between 2015 and 2020, and electronic recording system were reviewed. Approval of local ethical committee was obtained with approval number of 67 on June, 15th, 2020.

### Patient Selection and Data Collection

The patients were evaluated according to age, gender, complaint for referral, treatment method, and hospitalization



**Figure 3.** Abscess localization distribution in lithotomy position.

period. Hemogram, WBC, leukocyte count, platelet count, and C-reactive protein (CRP) analyses were performed on all patients. Pus culture was obtained from the patients who had spontaneous abscess drainage or abscess drainage through simple incision. Sitz bath sessions were implemented for abscesses without any significant fluctuation during conservative treatment period; drainage of the abscess is achieved by providing the drainage through a scalpel and trying to deform the wall integrity of the abscess following local anaesthetic pomade application (EMLA; AstraZeneca, Södertälje, Sweden) for abscesses with fluctuation finding following sitz bath sessions. The patients who were followed ambulatory were called for polyclinic control at day 7. The patients who were exposed to conservative treatment due to the diagnosis of PA were divided into two patient groups including outpatients (OP) and inpatients (IP) whom intravenous treatment were administered. Fistulotomy procedure was performed on all patients with recurrent abscess and consideration of fistula-in-ano (Fig. 2). Results of the patients who had fistulotomy were reviewed. SPSS program (21.0 version, IBM Company, SPSS Inc.) was used for statistical analysis. Numeric data were expressed in median, mean  $\pm$  standard deviation; categorical data were expressed in frequency (n) and percentage (%). Statistical significance of the differences between the groups were analysed by one-way ANOVA. Pearson's Chi-square test was used to evaluate the association between two nominal variables. A p value below 0.05 is accepted as statistically significant.

**Table 1.** Comparison of the groups treated with outpatient and hospitalization due to PA

Distribution of Results of Children with Perianal Abscess			p
Variable	Total number of patients (n=47)		
	Hospitalization (n=28, 59.6%)	Outpatient Treatment (n=19, 40.4%)	
Age (months)			
0–3	14 (50)	9 (47.3)	0.526*
3–6	8 (33.3)	7 (25.9)	
6–9	3 (10.7)	2 (10.5)	
9–12	3 (10.7)	1 (5.2)	
Gender			
Girl	1 (3.5)	4 (21.0)	0.126*
Male	27 (96.5)	15 (79.0)	
Abscess Localization			
9 o'clock	7 (25)	8 (42.1)	0.319*
3 o'clock	8 (28.7)	2 (10.5)	
Others	10 (35.7)	9 (47.3)	
Laboratory Results (median)			
WBC (103xmm <sup>3</sup> )	11.4 (4.5–18.4)	9.3 (4.3–14)	0.329**
CRP (mg/dL)	2.1 (0.1–41)	2.5 (1–16)	0.314**
Lökosit (103xmm <sup>3</sup> )	7300 (3.7–15.4)	6.4 (3.8–13.9)	0.297**
Trombosit (103xmm <sup>3</sup> )	246 (134–546)	283(188–613)	0.214**
Treatment Approach			
No drainage	6 (21.4)	9 (47.3)	0.724**
Spontaneous drainage	2 (7.1)	1 (5.2)	
Simple Drainage	20 (71.4)	9 (47.3)	
Fistulotomy			0.394**
Drainage (+)	4 (66.6)	2 (66.6)	
Drainage (–)	2 (33.3)	1 (33.3)	
Culture Results			
Klebsiella pneumonia	15 (53.5)	8 (42.1)	0.274**
E.coli	5 (17.8)	8 (10.5)	
Enterococcus species	2 (7.1)	0	
Others/No Culture	6 (21.4)	9 (47.3)	
Cost ***			
Average Health Insurance	434.51±66.58	99.5±29.66	0.001**
Reimbursement (TL)/patient	364.32±113.89	64.00±18.67	
Cost(TL)/patient			

WBC: White blood cell; CRP: C-reactive protein; \* Pearson Chi-square test; \*\* oneway ANOVA test.

## Results

### Demographic Findings

Forty-seven patients below 1 year of age who have been treated due to the diagnosis of PA in our clinic, without any other concomitant disease between January, 2015 and January, 2020 were enrolled into the study. The median age in the sample was 3 (1 to 12 months) months. The patients included 42 males (89.3%) and 5 females (10.7%). Evaluation of the patients below 1 year of age in quarterly peri-

ods revealed that PA was mostly diagnosed between 0 to 3 months of age (n=23, 48.9%); fourteen (60.8%) of the patients in this age group are hospitalized and treated. There was not any statistically significant difference in the OP and IP groups for age (p=0.526) (Table 1). The most common location of PA was at 9 o'clock (n=15, 31%), 3 o'clock and 8 o'clock levels at lithotomy position. Location of the abscess was less at 2 o'clock, 10 o'clock and 11 o'clock level at lithotomy position (Fig. 3). There was not any statistically significant difference in the OP and IP groups for location

of the abscess ( $p=0.319$ ) (Table 1). Assessment of clinical presentation of the patients included 4 (8.5%) patients with fever over 38 C0, and 7 (14.8%) patients with prolonged diarrhoea. No reproduction was detected in blood and urine cultures collected from the patients who were admitted because of fever and PA. Mean hospitalization period for the patients who were followed as inpatient was  $5.50\pm 2.50$  days. No outpatient was hospitalized because of perianal abscess during follow-up period. Fifteen (31.9%) patients developed recurrent/unhealed abscess during follow-up period despite adequate therapy for two weeks. Basic drainage was implemented on 12 of 15 patients who developed recurrent abscess. Fistulotomy procedure was performed on nine (19.1%) patients who have developed recurrent abscess.

### Clinical and Laboratory Factors Associated with Perianal Abscess

There was not any statistically significant difference between inpatient and outpatients for laboratory tests (Table 1). The abscess size was larger than 2 cm in 26 patients and smaller than 2 cm in 15 patients among 41 cases who have documentation about abscess size. The abscess was drained through spontaneous and basic drainage methods in 32 (68%) of the patients followed due to PA. The abscess is spontaneously drained in 3 patients; abscess drainage by simple incision was performed on 29 patients. Fifteen (32%) patients were followed without any surgical drainage procedure. Pus culture was obtained from all patients who had abscess drainage. Pus cultures resulted with reproduction of *Klebsiella pneumonia* in 17 patients, *E.coli* in 13 patients, and *Enterobacter* in 2 patients. Antibiotherapy was implemented to all patients at inpatient and outpatient basis. Twelve patients developed recurrent abscess during follow-up following the treatment. Eleven patients developed recurrent abscess at same location; and a recurrent abscess was detected at different location in one patient. FA was considered in nine patients who have developed recurrent abscess. Basic drainage procedure was implemented to 6 of the patients diagnosed with fistula-in-ano. There was not any difference between the patients who had drainage procedure and those who have not had drainage procedure for risk of FA development. Fistulotomy was performed on all patients whom FA was considered under general anaesthesia (Fig. 2). No complication and recurrent abscess developed after the procedure during follow-up in the patients who had fistulotomy. Comparison of treatment costs and returned fees by social security institution revealed a statistically significant difference in favour of OP group ( $p=0.001$ ) (Table 1).

### Discussion

Perianal abscess [PA and fistula-in-ano (FA)] are subsequent diseases which develop as a result of infections of abnormally deep crypts in infants and children. Perianal abscess is usually observed during newborn and infancy periods with a prevalence of 0.5% to 4.3% in infants.<sup>[1,5,6]</sup>

The abscess typically appears on perianal region, at 3 o'clock and 9 o'clock locations as a tumescence with fluctuation at lithotomy position (Fig. 1). Meyer et al.<sup>[6]</sup> reported the prevalence of male gender as 92.5%; similarly, Serour et al.<sup>[7]</sup> detected the male dominance by 97%. In the present study, all patients were younger than one year; and 89.3% of the patients were male. Locations of the lesions were generally at 3 o'clock or 9 o'clock level of perianal region. Such results comply with previous literature data.

The reason for higher prevalence of perianal abscess in male patients remains unclear. Suggested hypothesis include elevation of blood testosterone levels to maximum level in male infants within 1 to 3 months before prepubertal period, infection of deep and thick Morgagni's crypts by the effect of androgens, and the imbalance between androgen and oestrogen.<sup>[8-10]</sup>

Along with the reports indicating higher fistula prevalence like 60% to 88%, there are reports with lower prevalence ratios like 15% to 20%.<sup>[11-13]</sup>

In line with the literature, the prevalence of fistula was detected 19.1% in the present study.

Although there is not any consensus on therapeutic management of perianal abscess in the literature, medical follow-up is usually preferred. Many of the authors suggest a conservative approach including sitz bath, antiseptic and antibiotic therapy.<sup>[12-14]</sup>

Some authors assert that perianal abscess should be discharged; and medical therapy causes prolonged hospitalization period and longer antibiotic use.<sup>[14,15]</sup> On the other hand, it was reported that surgical treatment increases the risk for FA development and recurrence.<sup>[8]</sup> Surgical drainage was implemented to 29 (61.7%) patients; 6 (20.6%) patients developed fistula; and 2 (6.9%) patients developed fistula without drainage among outpatient and inpatient groups of the present study. There was not any statistically significant difference between the patients treated with basic surgical procedure and those treated conservatively for risk of fistula development ( $p=0.394$ ).

Chang et al.<sup>[16]</sup> reported that they have not use oral antibiotics routinely for treatment of PA except systemic symptoms severe inflammation or fever; and they claimed conservative treatment as the first treatment option for perianal abscess and fistula-in-ano.

However, Niyogi et al.<sup>[15]</sup> reported that conservative treatment of fistula-in-ano is associated with prolonged hospitalization, longer use of antibiotics, and more pain. There was not any statistically significant difference between OP and IP groups of the present study for risk of abscess and fistula development (Table 1).

Recent studies of the literature indicated that conservative treatment of PA is a good alternative in young children; however, use of antibiotics is not effective on recurrence of perianal abscess.<sup>[17,18]</sup> Since antibiotics were administered to all patients of the present study, efficiency of antibiotics on PA recurrence could not be evaluated.

Boenicke and Doerner et al. identified efficiency of conservative treatment of perianal abscess and determinants of the treatment failure in pediatric patients. They concluded that local hygiene practices and systemic antibiotherapy without surgical drainage minimize the fistula development.<sup>[19]</sup> Drainage procedure was not implemented to fifteen (31.9%) patients diagnosed with PA; thirteen patients were treated through conservative approach without need for additional surgical procedure.

Some authors suggest that elimination of the abscesses by fistulotomy under general anaesthesia would reduce recurrence rates for perianal abscess and fistula-in-ano.<sup>[20,21]</sup> In the present study, nine patients whom we have performed fistulotomy did not develop any complication and recurrence.

Although surgical treatment is a commonly accepted treatment for fistula-in-ano, recent approach recommends avoiding fistulotomy due to limited pattern of the fistule development.<sup>[22]</sup> Christison-Lagay et al.<sup>[23]</sup> reported that the risk of fistula formation increases by non-operative treatment of perianal abscess in infants. Another author reported that excessively detailed examination of perianal abscess and fistula route carefully may cause iatrogenic fistula formation.<sup>[24]</sup> Some authors primarily prefer surgery; and others support conservative treatment including sitz bath with or without antibiotics. Surgical treatment of perianal abscess and fistula-in-ano has become an accepted method conventionally.

Despite the fact that perianal abscess and fistula are common in the children, management of these diseases remains to be contradictory. Clinical progression and outcomes of the disease is different from adults; an alternative aetiology is discussed in the children below one year of age.<sup>[25,26]</sup>

Today, depending on the surgeon's preference, conservative and surgical methods are used for management of PA; this fact occupies that a common treatment method should be created. The data obtained from the present study demonstrates that conservative approach is also successful for treatment of perianal abscess and fistula-in-ano.

In the present study, there was not any difference between inpatient and outpatient treatment parameters when conservative and surgical treatment outcomes were compared in the children below one year of age diagnosed with PA.

## Conclusion

Although characteristics of PA and FA are well-known, treatment on the children is contradictory. Conservative treatment of PA includes sitz bath and being careful on local hygiene. Conservative treatment may be implemented on eligible paediatric patients diagnosed with PA. In the patients who do not respond to conservative treatment, sitz bath for the abscess with complete fluctuation, and basic drainage with or without topical anaesthesia are the most common therapies for perianal abscess. In addition, considerable discussions about efforts to identify a fistula during abscess drainage are involved in the literature.

This study has some limitations. The study was designed in a retrospective pattern; number of the patients is limited. In consideration of outcomes of PA treatment with or without anal fistula, we believe that a further prospective study with larger patient series is required in order to make a clear conclusion.

## Disclosures

**Ethics Committee Approval:** The ethics committee of University of Health Sciences Kocaeli Derince Training and Research Hospital Clinical Research provided the Ethics Committee approval for this study (14.07.2020-2020/84).

**Peer-review:** Externally peer-reviewed.

**Conflict of Interest:** The authors did not report any conflict of interest on this manuscript.

**Authorship Contributions:** Concept – Y.A.B., O.V.; Design – O.V., S.E.S.; Supervision – S.E.S., Y.A.B.; Materials – O.V., Y.A.B.; Data collection &/or processing – Y.A.B., S.E.S.; Analysis and/or interpretation – O.V., S.E.S.; Literature search – Y.A.B., O.V.; Writing – Y.A.B., S.E.S.; Critical review – Y.A.B., O.V.

## References

1. Afşarlar CE, Karaman A, Tanir G, Karaman I, Yılmaz E, Erdoğan D, et al. Perianal abscess and fistula-in-ano in children: clinical characteristic, management and outcome. *Pediatr Surg Int* 2011;27:1063–8.
2. Emile SH, Elfeki H, Abdelnaby M. A systematic review of the management of anal fistula in infants. *Tech Coloproctol* 2016;20:735–44.
3. Ommer A, Herold A, Berg E, Fürst A, Post S, Ruppert R, et al. German S3 guidelines: anal abscess and fistula (second revised version). *Langenbecks Arch Surg* 2017;402:191–201.
4. Nelson R. Anorectal abscess fistula: what do we know?. *Surg Clin North Am* 2002;82:1139–51.

5. Tanır Basaranoglu S, Ozsurekci Y, Cengiz AB, Karadag Oncel E, Aykac K, Kara A, Ceyhan M. Perianal abscess in children: A pediatric infectious disease perspective. [Article in Spanish]. *An Pediatr (Barc)* 2019;90:370–5.
6. Meyer T, Weininger M, Höcht B. Perianal abscess and anal fistula in infancy and childhood. A congenital etiology?. [Article in German]. *Chirurg* 2006;77:1027–32.
7. Serour F, Somekh E, Gorenstein A. Perianal abscess and fistula-in-ano in infants: a different entity? *Dis Colon Rectum* 2005;48:359–64.
8. Festen C, van Harten H. Perianal abscess and fistula-in-ano in infants. *J Pediatr Surg* 1998;33:711–3.
9. Poenaru D, Yazbeck SV. Anal fistula in infants: etiology, features, management. *J Pediatr Surg* 1993;28:1194–5.
10. Shafer AD, McGlone TP, Flanagan RA. Abnormal crypts of Morgagni: the cause of perianal abscess and fistula-in-ano. *J Pediatr Surg* 1987;22:203–4.
11. Arditi M, Yogev R. Perirectal abscess in infants and children: Report of 52 cases and review of the literature. *Pediatr Infect Dis J* 1990;9:411–5.
12. Murthi GV, Okoye BO, Spicer RD, Cusick EL, Noblett HR. Perianal abscess in childhood. *Pediatr Surg Int* 2002;18:689–91.
13. Zwintscher NP, Shah PM, Argawal A, Chesley PM, Johnson EK, Newton CR, et al. The impact of perianal disease in young patients with inflammatory bowel disease. *Int J Colorectal Dis* 2015;30:1275–9.
14. Oh JT, Han A, Han SJ, Choi SH, Hwang EH. Fistula-in-ano in infants: Is nonoperative management effective? *J Pediatr Surg* 2001;36:1367–9.
15. Niyogi A, Agarwal T, Broadhurst J, Abel RM. Management of perianal abscess and fistula-in-ano in children. *Eur J Pediatr Surg* 2010;20:35–9.
16. Chang HK, Ryu JG, Oh JT. Clinical characteristics and treatment of perianal abscess and fistula-in-ano in infants. *J Pediatr Surg* 2010;45:1832–6.
17. Rosen NG, Gibbs DL, Soffer SZ, Hong A, Sher M, Peña A. The nonoperative management of fistula-in-ano. *J Pediatr Surg* 2000;35:938–9.
18. Watanabe Y, Todani T, Yamamoto S. Conservative management of fistula-in-ano in infants. *Pediatr Surg Int* 1998;13:274–6.
19. Boenicke L, Doerner J, Wirth S, Zirngibl H, Langenbach MR. Efficacy of conservative treatment of perianal abscesses in children and predictors for therapeutic failure. *Clin Exp Pediatr* 2020;63:272–7.
20. Rizzo JA, Naig AL, Johnson EK. Anorectal abscess and fistula-in-ano: evidence-based management. *Surg Clin North Am* 2010;90:45–68.
21. Stites T, Lund DP. Common anorectal problems. *Semin Pediatr Surg* 2007;16:71–8.
22. Davies M, Harris D, Lohana P, Chandra Sekaran TV, Morgan AR, Beynon J, et al. The surgical management of fistula-in-ano in a specialist colorectal unit. *Int J Colorectal Dis* 2008;23:833–8.
23. Christison-Lagay ER, Hall JF, Wales PW, Bailey K, Terluk A, Goldstein AM, et al. Nonoperative management of perianal abscess in infants is associated with decreased risk for fistula formation. *Pediatrics* 2007;120:548–52.
24. Novotny NM, Mann MJ, Rescorla FJ. Fistula in ano in infants: who recurs? *Pediatr Surg Int* 2008;24:1197–9.
25. Serour F, Gorenstein A. Characteristics of perianal abscess and fistula-in-ano in healthy children. *World J Surg* 2006;30:467–72.
26. Macdonald A, Wilson-Storey D, Munro F. Treatment of perianal abscess and fistula-in-ano in children. *Br J Surg* 2003;90:220–1.