

ORIGINAL RESEARCH

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Treatment of perianal abscess in children: spontaneous drainage or incision-drainage?

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Abstract

Background: The aim of the study is to evaluate the clinical characteristics and compare the treatment methods for perianal abscesses by assessing our treatment experiences.

Methods: We have retrospectively analyzed the records of the children who received perianal abscess and fistula-in-ano treatment between January 2014 and January 2022. Demographic information of the patients, complaints, treatment procedures, abscess recurrence, and development of fistula-in-ano was evaluated. Patients with systemic diseases and inflammatory bowel diseases were excluded from the study.

Results: A total of 312 children (230 boys, 82 girls) were included in the study. The median age was 24.3 ± 18.1 months (1–216). In the first examination, 61 (19.5%) patients had fistula-in-ano and 251 (80.5%) patients had a perianal abscess. The most common symptoms were erythema in the perianal region, mass, constipation, rectal bleeding, and inability to defecate. Spontaneous drainage was determined in 34.3% ($n = 86$) of the perianal abscess, and 65.7% ($n = 165$) of perianal abscesses were treated with incision-drainage without general anesthesia and systemic antibiotic therapy. In the follow-up, fistula-in-ano formed in 27 patients who had a perianal abscess. Twenty-four of the patients who developed fistula-in-ano, were seen after spontaneous drainage, and 3 of them were seen after incision drainage. Perianal abscess recurred in 64 patients. Spontaneously drained abscess significantly increased the development of fistula-in-ano ($p = 0.001$). However, recurrences in a perianal abscess (25.4%) do not increase the fistula-in-ano formation ($p > 0.05$). In fistula-in-ano treatment, 10 (11.5%) patients were resolved spontaneously, 70 (79.5%) patients were treated with fistulotomy and 8 (9%) patients were treated with fistulectomy.

Conclusion: Treatment of perianal abscess and fistula-in-ano in children is still controversial. According to our results, incision-drainage and antibiotic usage in the treatment of the perianal abscess are the most appropriate treatment to decrease the rate of fistula-in-ano.

Keywords: Child, Perianal abscess, Fistula-in-ano, Recurrence, Incision-drainage, Spontaneous drainage

Background

Perianal abscess (PA) and fistula-in-ano (FIA), which originate from abnormal crypts, are common pathologies in the pediatric population [1]. Physical examination usually reveals a painful lump in the anal area, and the skin over the lesion is erythematous. PAs and FIAs are

sometimes accompanied by higher temperatures (Fig. 1). In some patients, during the physical examination, purulent discharge is excreted from the anus when the nodule is pressed, and this demonstrates the presence of a hollow channel penetrating the anus—an anal fistula. Most patients who are affected by this condition are infant males, and they are usually younger than 1 year old [2]. The pathogenesis of a pediatric PA has been described as deep abnormal crypts or abnormal glands within an irregularly thickened dentate line that may spontaneously

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Fig. 1 The view of perianal abscess

discharge or get infected and hence lead to a FIA [3]. The recurrence of an abscess or the development of a fistula after the initial treatment of the PA is likely; the literature reports a range from 5 to 80% [4, 5]. The current treatment of PAs in children remains debatable. The different options include conservative treatment, medical treatment with antibiotics, incision and drainage (ID) alone, and ID by disruption of the fistula [6, 7]. The aim of the study is to evaluate the clinical characteristics and compare the treatment methods of perianal abscess by assessing our treatment experiences.

Materials and methods

A retrospective analysis of the records of all children younger than 18 years of age who were treated for PAs and FIAs from January 2014 to January 2022 was conducted in our clinic. The demographic information of the patients, location of the lesions, duration of symptoms, treatment procedures, abscess recurrence, and development of FIAs were recorded and compared to the treatment methods. Children with a diagnosis of Crohn's disease or other known preexisting bowel conditions were excluded from the study.

The patients were divided into two groups based on their treatment methods: spontaneous drainage (SD) group and incision-drainage (ID) group. The groups were analyzed and compared the treatment results, recurrences, and development of FIA.

Also, the patients were divided into two groups based on their age distribution: 0- to 1-year-old infants and children who were older than 1 year of age. The groups were analyzed through an investigation of risk factors for the development of FIAs.

In the supine position, the perianal region centering the anus was divided into four quadrants. These

quadrants are the first (from 11:00 to 13:00 o'clock), second (from 14:00 to 16:00 o'clock), third (from 17:00 to 19:00 o'clock), and fourth (from 20:00 to 22:00 o'clock) in the clockwise direction. For each quadrant, the location of the abscess and fistula and the effects of the location of the abscess on recurrence and development of fistulas were analyzed. Ethical approval was obtained for this study from Ankara City Hospital Ethical Committee (E2-21-239).

All statistical analyses were carried out using IBM SPSS Statistics Version 23.0. The relationship between two independent categorical variables was interpreted using a chi-square analysis. In cases where the assumption for the expected value was not achieved, Fisher's exact test results were used. Continuous variables were reported as median (range). Categorical variables were reported as a numerical value out of the total number (%). Fisher's exact test and the Mann-Whitney *U* test were used for comparisons of categorical data. A *p*-value < 0.05 was considered statistically significant for all analyses.

Results

A total of 312 children (230 boys and 82 girls) aged between 22 days and 18 years who were treated for PAs and FIAs were included in the study. One hundred sixty-five (52.8%) of the patients were less than 12 months old, and 147 (47.2%) were older than 12 months old. There were no significant differences between the two groups in terms of gender distribution, symptom duration, location of lesions, treatment procedures, abscess recurrence, and FIA formation ($p > 0.05$). Although FIA was observed more frequently in infants, there was no statistically significant difference between the two age groups in terms of FIA development ($p > 0.05$) (Table 1).

During the initial examination of the patients, 61 FIAs and 251 PAs were diagnosed. Spontaneous drainage (SD) was detected in 34.3% ($n = 86$) of PAs, and 65.7% ($n = 165$) were surgically drained by ID. After PA drainage, it was found during follow-up that 27 of the 251 (10.7%) PA patients developed a FIA (Fig. 2). It was determined that 24 of the 27 (88.8%) patients who developed FIAs during their follow-up period had their FIA after SD. SD of PAs significantly increased the development of FIAs ($p = 0.001$). Eighty of the 88 (90.9%) FIA patients were male, and eight (9.1%) were female. FIA development was observed more often in males, and this difference was statistically significant ($p = 0.035$).

According to the four clockwise groups of the perianal region, although PA was found most often in the fourth quadrant ($n = 90$, 37%) and FIA was found most often in the second quadrant ($n = 20$, 44%), no statistically significant differences were observed ($p > 0.05$).

Table 1 Demographic characteristics and clinical results of the patients by age

| | Age < 1 year | Age > 1 year | Total | <i>p</i> -value |
|--|--------------------|--------------------|--------------------|-----------------|
| Patient, <i>n</i> (%) | 165 (52.8) | 147 (47.2) | 312 | |
| Age in months (mean ± Sd) | 6.3 ± 4.4 | 36.3 ± 42.9 | 24.3 ± 18.1 | |
| Male/female, <i>n</i> (%) | 123/42 (74.5/25.5) | 107/40 (72.7/27.3) | 230/82 (73.6/26.4) | 0.339 |
| Symptom duration in days (mean ± Sd) | 25 ± 11 | 37 ± 15 | 29 ± 14 | 0.970 |
| PA, <i>n</i> (%) | 139 (84.2) | 112 (76.1) | 251 (80.5) | 0.267 |
| FIA, <i>n</i> (%) | 26 (15.8) | 35 (23.8) | 61 (19.5) | |
| Lesion region | | | | |
| PA, 1/2/3/4, <i>n</i> | 33/24/32/50 | 38/23/11/40 | 71/47/43/90 | 0.456 |
| FIA, 1/2/3/4, <i>n</i> | 8/12/2/4 | 5/10/5/15 | 13/22/7/19 | |
| PA treatment, <i>n</i> | 139 | 112 | 251 (80.5) | 0.791 |
| SD, <i>n</i> (%) | 50 (35.9) | 36 (32.2) | 86 (34.3) | |
| ID, <i>n</i> (%) | 89 (64.1) | 76 (67.8) | 165 (65.7) | |
| FIA, <i>n</i> (%) | 26 | 35 | 61 (19.5) | 0.545 |
| FIA development in follow-up, <i>n</i> | 18 | 9 | 27 | 0.001* |
| SD, <i>n</i> (%) | 17 (94.4) | 7 (77.7) | 24 (88.8) | |
| ID, <i>n</i> (%) | 1 (5.6) | 2 (22.3) | 3 (11.2) | |
| FIA treatment | | | | 0.064 |
| Fistulotomy, <i>n</i> | 40 | 30 | 70 | |
| Fistulectomy, <i>n</i> | 0 | 8 | 8 | |
| Resolved FIA, <i>n</i> | 5 | 5 | 10 | |

Sd, standard deviation, PA, perianal abscess, FIA, fistula-in-ano, SD, spontaneously drained, ID incision and drainage

PA recurrence was observed in 64 patients. Having a recurrence of the PA (25.4%) did not affect the development of a FIA ($p > 0.05$) (Table 2).

The mean follow-up period of the patients was 19.3 ± 1.6 months. During the follow-up period, 10 (11.5%) of a total of 88 FIAs recovered spontaneously. All the patients were male, including patients whose FIA was detected during the first examination. Another finding is that there was no statistically significant difference between the infants whose FIAs recovered ($n = 5$) and the children with FIAs ($n = 5$) ($p > 0.05$). Patients with FIAs were treated with fistulotomy ($n = 70$) (Figs. 3 and 4) or fistulectomy ($n = 8$). No complications or recurrences were observed in patients following surgical treatment of their FIA.

Discussion

PA and FIA are common findings in infants and children. Infants tend to have a relatively higher incidence of PA/FIA than older children, and boys tend to have a relatively higher incidence of PA/FIA than girls [8, 9]. Consistent with the literature, male predominance (73.7% of infants and 47.2% of children) was noted in our study group.

In a study by Ezer et al., PA and FIA were most frequently observed at 9 o'clock and 3 o'clock [5]. Afsarlar et al. divided the perianal region into four quadrants of a clock. They found that the most common site of PAs

and FIAs in both infants and children was the fourth quadrant. In addition, they found that PAs in the first and third quadrants were more likely to develop into FIAs compared to the second and fourth quadrants; the difference in this comparison was statistically significant [10]. In our study, it was observed that PAs developed into FIAs more frequently in the second quadrant.

The approach in our clinic for every patient who presents with a PA or FIA is to recommend warm sitz baths and local wound care and to start antibiotic treatment. The fluctuating abscess is treated with ID without anesthesia as an outpatient. Clinical relief is observed in patients with incisional drainage. Conservative treatment without antibiotics alone is not used in any cases.

PA and FIA in infancy are characterized by a self-limiting process. Left on its own, the abscess will usually drain out of the skin on its own, causing symptoms to subside. Recent studies show that PA and FIA in infants are usually self-limiting, and the conservative approach is the first-line treatment in this age group, and surgery should be preferred for complex fistulas and failed conservative treatment [11]. In our study, 35.9% of patients with PA under 1 year of age were left to spontaneous drainage, while 32.2% of patients over 1 year of age were left to spontaneous drainage. There was no statistical difference between the age groups in terms of treatment approach ($p = 0.79$).

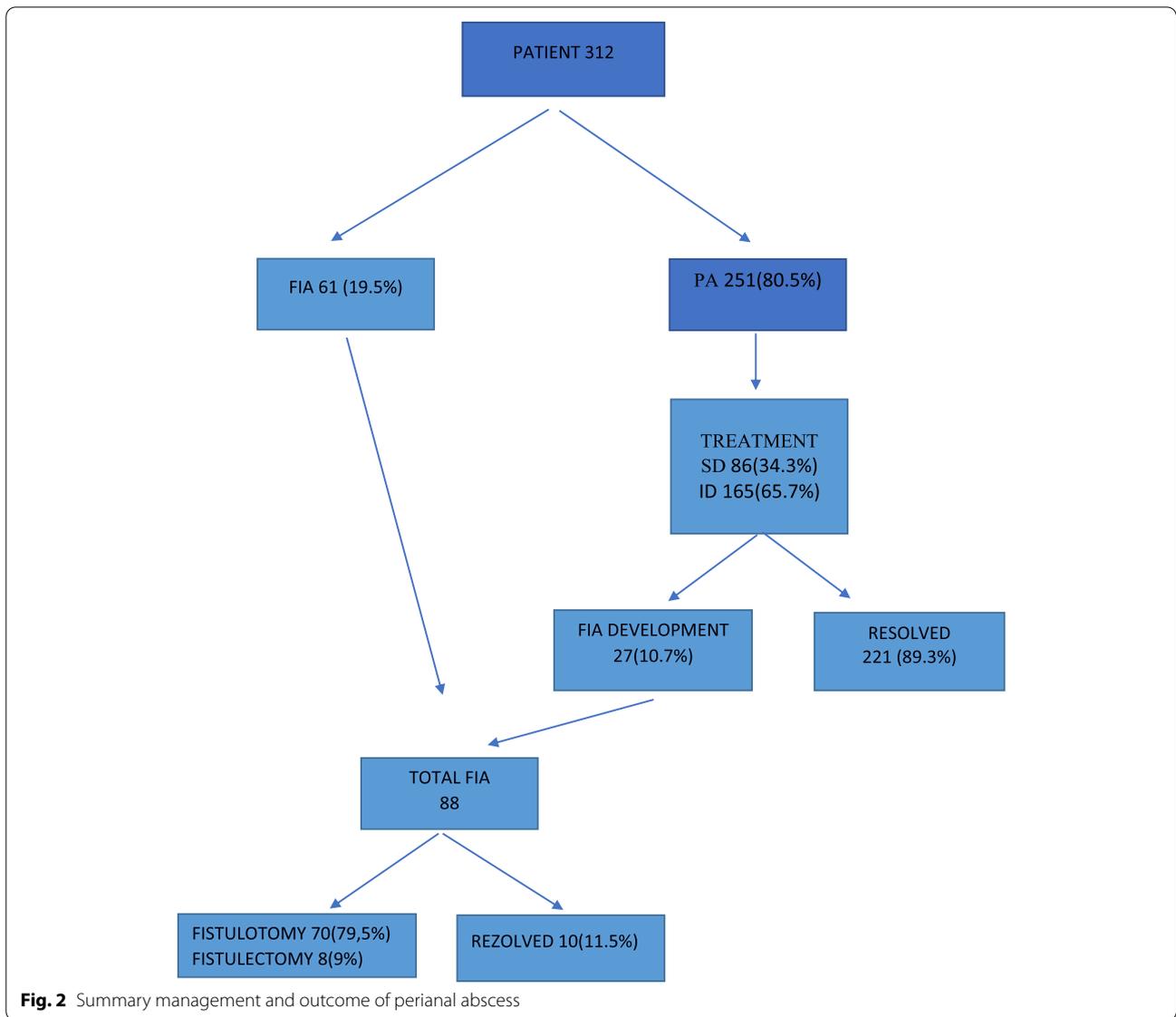


Table 2 Demographic characteristics and clinical results of patients who developed FIA and did not develop FIA during follow-up

| | PA with FIA in follow-up | PA without FIA in follow-up | Total | p-value |
|--------------------------------------|--------------------------|-----------------------------|-------------|---------------|
| Patient, n (%) | 27 (10.1) | 224 (79.9) | 251 | |
| Age in months (mean ± Sd) | 47.8 ± 35.4 | 65.3 ± 45.2 | 56.7 ± 15.2 | 0.954 |
| Male/female, n (%) | 27/0 (100/0) | 149/75 (66.5/33.5) | 176/75 | 0.035* |
| Symptom duration in days (mean ± Sd) | 35.1 ± 21.8 | 18 ± 12.4 | 28 ± 18.3 | 0.009* |
| Lesion region | | | | |
| PA, 1/2/3/4, n (%) | 4/12/7/4 | 63/37/38/86 | 67/49/45/90 | 0.267 |
| FIA, 1/2/3/4, n (%) | 15/45/25/15 | 28/16/17/39 | 26/20/17/37 | |
| Treatment | | | | |
| SD, n (%) | 22 (88.0) | 64 (28.9) | 86 (34.9) | 0.001* |
| ID, n (%) | 3 (12.0) | 157 (71.1) | 160 (65.1) | |
| PA with recurrence, n (%) | 6 (22.2) | 58 (25.4) | 64 (26) | 0.235 |
| PA without recurrence, n (%) | 21 (77.3) | 165 (74.6) | 186 (74) | |



Fig. 3 The photographs of the fistulotomy procedure



Fig. 4 The recovery period after fistulotomy

Incision and drainage are the most traditional and commonly performed operational procedures. Incision and drainage of the abscess are recommended for patients with fluctuation for more than 4 days from onset without signs of abscess perforation or diffusion. The use of antibiotics after incision and drainage can effectively shorten the clinical course and reduce the spread of abscess or

fistula formation [10, 12]. In our study, ID therapy was applied to 64.1% of patients with PA. Treatment of PA with ID remains the treatment of choice in many centers, as it provides faster pain relief and wound healing compared to spontaneous drainage (SD) [13, 14]. Among the patients who were treated surgically, 29% were reported to have FIA in the further course [12]. In our study, the rate of FIA development was found to be 1.8% in the patients treated with ID, while the rate of development of FIA in those treated with SD was 27.9%. Statistically, the rate of fistula development was found to be higher in patients with SD ($p = 0.001$).

The most conservative management includes topical treatment and waiting for spontaneous emptying of the abscess and healing. This approach has an increasing effect on local inflammation, especially in infants. The frequency of anal fistula development has been reported to reach 77% with this type of conservative management [15].

In their study, Charalampopoulos et al. observed that no fistulas developed during follow-up in any of the babies who underwent drainage [13]. It has been reported in the literature that the incidence of PA converting to FIA varies but can be up to 85% in children [15, 16]. In our study, conversion to FIA was observed at a rate of 10.7%. Also, the development of FIA was significantly higher after SD. In our cases, we found that early incisional drainage of PA decreased the development of FIA.

After a fistula develops, if conservative treatment fails, surgical treatment is recommended [17]. In our study, 10 (11.5%) of the patients who were followed up with FIA in our clinic recovered without surgery after antibiotics and conservative treatment. Studies have found that after the removal of a FIA (fistulotomy or fistulectomy), the frequency of recurrence in children is lower (12–15%) [5, 17]. In our study, in accordance with the literature, no recurrence of FIA was observed in any of our treated patients surgically.

The principal limitation of this study is that the data were obtained retrospectively from patient records. Another limitation is that patients could not be compared in terms of conservative treatment, since all patients received antibiotic treatment. Randomized prospective studies are needed to compare appropriate treatment approaches.

Conclusion

Treatment of perianal abscess and fistula-in-ano in children is still controversial. We think that patients who are left to have SD develop FIA more frequently. The use of antibiotics in addition to ID of a PA is the most appropriate treatment and reduces the risk of developing into FIA. Therefore, conservative treatment modalities that allow abscesses to drain spontaneously should not be used alone.

Abbreviations

PA: Perianal abscess; FIA: Fistula-in-ano; SD: Spontaneous drainage; ID: Incision-drainage.

Authors' contributions

All authors contributed to the design of the work, collection and analysis of the data, drafting and revision of the manuscript, and approval of the final version for publishing.

Funding

None.

Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations**Ethics approval and consent to participate**

The study was approved by the ethical committee of Ankara City Hospital (IRB no: E2-21-239).

Consent for publication

Not applicable

Competing interests

The authors declare that they have no competing interests.

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Received: 29 April 2022 Accepted: 2 August 2022

Published online: 22 September 2022

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