

Antibiotics in prevention of fistula following surgical treatment of simple anal abscess: A retrospective study

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ABSTRACT

Anorectal abscesses are commonly managed through prompt surgical drainage, yet progression to fistula-in-ano remains a significant postoperative complication. Current guidelines discourage routine antibiotic use in simple anal abscesses, although emerging data challenge this practice. This retrospective study evaluated the effectiveness of prophylactic ciprofloxacin and metronidazole in preventing fistula formation following surgical treatment of simple anal abscesses at Colonel Lotfi Hospital from January 2022 to December 2024. Fifty-eight patients were included and stratified into two groups: those receiving postoperative antibiotics (n = 30) and those treated with drainage alone (n = 28). Fistula formation occurred in 34.5 percent of cases overall, with a higher incidence observed in the antibiotic group versus the no-antibiotic group (40 percent vs. 28.6 percent, p = 0.39). Antibiotic administration did not demonstrate a statistically significant protective effect. Logistic regression identified symptom duration greater than two days and wound healing time exceeding twenty-one days as independent predictors of fistula development (p < 0.05). These findings support existing recommendations against routine antibiotic prophylaxis in uncomplicated anal abscess drainage and highlight the importance of timely intervention and optimal wound healing. Larger prospective studies are needed to better define high-risk patient subsets that may benefit from targeted antibiotic therapy.

Keywords : Anal abscess, Fistula-in-ano, Antibiotic prophylaxis

INTRODUCTION

Anorectal abscesses, characterized by perianal skin redness, swelling, and pain, stem from infections of the anal glands, whereas fistulas result from chronic inflammation and epithelialization that connect the infected anal gland to the perianal skin, typically presenting with persistent drainage^[1]. The American Society of Colon and Rectal Surgeons recommends against the routine use of antibiotics following simple anal abscess drainage, except in cases of cellulitis, systemic infection signs, or immunosuppression^[2]. Prompt incision and complete drainage remain the cornerstone of treatment, relieving pain and preventing complications such as recurrence and fistula formation^[3].

Despite these guidelines, emerging data suggest that antibiotics may reduce the risk of fistula formation following abscess drainage. This question remains especially relevant in our local context, where resource limitations and differences in patient profiles warrant reevaluation of international protocols^[4].

This study aims to evaluate the efficacy of prophylactic antibiotics—specifically ciprofloxacin and metronidazole—in preventing fistula formation following surgical drainage of simple anal abscesses in patients treated at Colonel Lotfi Hospital between January 2022 and December 2024.

As a secondary objective, the study also seeks to identify potential risk factors associated with the development of fistula-in-ano following abscess treatment.

METHODOLOGY

This retrospective study encompassed 58 patients who underwent drainage for simple anal abscesses at Colonel Lotfi Hospital between January 2022 and December 2024. Exclusion criteria were implemented to ensure a homogeneous study population, specifically excluding patients with cellulitis, systemic signs of infection, underlying immunosuppression, previous anorectal surgery, inflammatory bowel disease, or the presence of an internal fistula opening. The study population was divided into two groups: one group of 28 patients did not receive antibiotics following abscess drainage, while the other group of 30 patients received a combination of ciprofloxacin and metronidazole during hospitalization and for 10 days post-surgery. Data collected included patient demographics such as age and gender, duration of symptoms, abscess type (perianal, intersphincteric, ischiorectal), length of hospitalization, rehospitali-

zation rate, duration of skin healing, and the development of fistula. The decision to administer or withhold antibiotics was based on the surgeon's clinical judgment, reflecting real-world practice variations. Univariate and multivariate analyses were performed to identify risk factors for fistula formation, considering variables such as age, gender, symptom duration, abscess type, antibiotic use, and length of hospitalization. Our data collection methods were designed to capture all relevant variables affecting fistula development, enhancing the reliability of our results. Statistical analysis was performed using SPSS software, with p-values < 0.05 considered statistically significant.

RESULTS

The study population included 58 patients, comprising 43 males (74.1%) and 15 females (25.9%), with a mean age was 33.72 ± 10.6 years. The average duration of symptoms before seeking medical care was 2.4 ± 1.2 days. Perianal abscesses were the most frequently encountered type (n = 49, 84.5%), followed by intersphincteric (n = 7, 12.1%) and ischiorectal abscesses (n = 2, 3.4%), in line with previous epidemiological patterns (Table 1).

The mean hospital stay was 1.70 ± 0.9 days, and two patients (3.4%) required rehospitalization due to cellulitis. The mean time to complete skin healing was 23 ± 5.7 days. Fistula formation occurred in 20 patients (34.5%) during follow-up.

Variable	Total (n = 58)	Antibiotic Group (n = 30)	No-Antibiotic Group (n = 28)	p-value
Age (mean $\pm$ SD, years)	33.72 ± 10.6	34.33 ± 11.2	33.12 ± 9.7	0.71
Sex (M/F)	43 / 15	24 / 6	19 / 9	0.34
Symptom duration (days)	2.4 ± 1.2	2.66 ± 1.3	2.14 ± 0.9	0.12
Abscess type:				
Perianal	49 (84.5%)	27 (90%)	22 (78.6%)	0.21
Intersphincteric	7 (12.1%)	2 (6.7%)	5 (17.9%)	
Ischiorectal	2 (3.4%)	1 (3.3%)	1 (3.6%)	

Tableau 1 Demographic and clinical characteristics of the study population

To assess the potential role of antibiotics, patients were divided into two sub-groups. In the antibiotic group (n = 30), the mean age was 34.33 ± 11.2 years and 80% were male, while in the no-antibiotic group (n = 28), the mean age was 33.12 ± 9.7 years with 67.9% male patients. There was no statistically significant difference in demographic characteristics between the groups. The duration of symptoms before treatment was slightly longer in the antibiotic group (2.66 ± 1.3 days vs. 2.14 ± 0.9 days, p = 0.12). Hospitalization duration was marginally shorter in the antibiotic group (1.6 ± 0.8 vs. 1.8 ± 1.0 days), though not statistically significant (p = 0.34). However, skin healing occurred more rapidly in the antibiotic group (21 ± 4.9 vs. 24 ± 5.6 days, p = 0.045). Notably, fistula formation was more frequent in the antibiotic group (40%) than in the no-antibiotic group (28.6%), though this difference did not reach statistical significance (p = 0.39) (Table 2).

Outcome	Antibiotic Group (n = 30)	No-Antibiotic Group (n = 28)	p-value
Hospital stay (mean $\pm$ SD, days)	1.6 ± 0.8	1.8 ± 1.0	0.34
Skin healing time (mean $\pm$ SD, days)	21 ± 4.9	24 ± 5.6	0.045
Rehospitalization (n, %)	1 (3.3%)	1 (3.6%)	0.96
Fistula formation (n, %)	12 (40%)	8 (28.6%)	0.39

Tableau 2 Outcomes according to antibiotic use

To identify potential predictors of fistula formation, univariate and multivariate logistic regression analyses were performed (Table 3). In the univariate analysis, two variables showed significant associations: symptom duration > 2 days (OR: 3.30; 95% CI: 1.06–10.28; $p = 0.039$) and healing time > 21 days (OR: 3.15; 95% CI: 1.05–9.44; $p = 0.041$). These associations remained significant in multivariate analysis, where symptom duration > 2 days (aOR: 3.04; 95% CI: 1.01–9.15; $p = 0.048$) and healing time > 21 days (aOR: 2.98; 95% CI: 1.00–8.89; $p = 0.049$) were independently associated with an increased risk of fistula formation. Other factors such as age, sex, abscess type, and antibiotic use were not found to be independent predictors.

Variable	Fistula (n=20)	No Fistula (n=38)	Univariate OR (95% CI)	p-value	Adjusted OR (95% CI)	p-value
Age > 35 years	9 (45%)	12 (31.6%)	1.76 (0.61-5.07)	0.29	1.45 (0.48-4.34)	0.51
Male sex	16 (80%)	27 (71%)	1.60 (0.43-5.89)	0.48	1.74 (0.43-7.07)	0.44
Symptom duration > 2 days	15 (75%)	18 (47.4%)	3.30 (1.06-10.28)	0.039	3.04 (1.01-9.15)	0.04
Perianal abscess	17 (85%)	32 (84.2%)	1.05 (0.24-4.60)	0.95	1.91 (0.64-5.66)	0.24
Antibiotic use	12 (60%)	18 (47.4%)	1.65 (0.58-4.69)	0.35	2.98 (1.00-8.89)	0.04
Healing time > 21 days	14 (70%)	16 (42.1%)	3.15 (1.05-9.44)	0.041		

Tableau 3 Univariate and multivariate logistic regression

DISCUSSION

Our study investigated the role of prophylactic antibiotics in preventing fistula formation following surgical drainage of simple anal abscesses. Contrary to some previous studies, our results indicated a higher incidence of fistula formation in the antibiotic group compared to the no-antibiotic group. This observation raises questions about the efficacy of routine antibiotic use in such cases, especially considering potential adverse effects and the rise of antibiotic resistance. While some studies suggest a protective role for antibiotics against fistula formation, our findings align with those indicating that antibiotic usage did not decrease the rate of fistula formation; the rate of fistula formation was significantly higher with antibiotics than with placebo^[4]. The American Society of Colon and Rectal Surgeons recommends against routine antibiotic use after drainage of simple anal abscesses, a guideline supported by our data, which suggests that antibiotics may not provide a significant benefit in preventing fistula development and could potentially increase the risk^[5]. Our study's design, while retrospective, reflects real-world clinical practice, where antibiotic decisions are often based on individual surgeon's judgment. This approach enhances the applicability of our findings to similar healthcare settings. The observed difference in fistula rates between the two groups may be attributed to several factors. First, the type of abscess, with ischiorectal and intersphincteric abscesses showing a higher risk of fistula formation, as supported by existing literature^[4]. Second, the use of antibiotics may disrupt the natural microbial balance, potentially creating an environment conducive to fistula development^[6]. Furthermore, the polymicrobial nature of perianal abscesses, with "Escherichia coli" and "Bacteroides" spp. being the most common organisms, may not be effectively targeted by the chosen antibiotic regimen, as culture results have not been preventing fistula development and could potentially increase surgical site infection^[7], which may increase the risk of surgical site infections^[8]. The role of non-steroidal anti-inflammatory drugs should be considered, as they can significantly increase the risk for anastomotic complications among patients undergoing non-elective colorectal resection^[9]. The overuse of antibiotics is a growing concern, as it promotes the emergence of antibiotic-resistant bacteria^[10], contributing to increased morbidity and mortality^[11]. Therefore, a more judicious approach to antibiotic use, based on patient-specific factors and a thorough assessment of the risk-benefit ratio, is warranted^[12,13]. Future research should focus on identifying high-risk subgroups that may benefit from targeted antibiotic therapy, as well as exploring alternative strategies, such as improved surgical techniques and enhanced wound care protocols, to reduce the incidence of post-operative fistulas^[11]. Our findings underscore the importance of judicious antibiotic use following anorectal abscess drainage, advocating for adherence to established guidelines that discourage routine antibiotic administration in uncomplicated cases.

The potential for innovative treatments during the early healing phase of surgical interventions, such as those addressing gap formation in the healing tissue, should be considered^[14]. The pathogenesis of complicated cases. The potential for innovative treatments during the early healing phase of surgical interventions, such as those addressing gap formation in the healing tissue, should be considered^[14]. The pathogenesis of fistula formation is complex and multifactorial, involving both infectious and non-infectious etiologies. Further prospective, randomized controlled trials are needed to validate our results and to identify optimal strategies for preventing fistula formation after anorectal abscess drainage. The study's focus on a specific patient population within a single institution may limit the generalizability of the findings. Despite the ASCRS guidelines advocating against routine antibiotic use for simple anal abscesses, the debate continues due to conflicting evidence^[15]. The potential of antibiotics to disrupt the intestinal barrier and promote bacterial translocation, which leads to systemic inflammation, is a crucial consideration when deciding whether to administer antibiotics postoperatively^[16]. This systemic inflammation can negatively impact wound healing and increase the risk of complications, including fistula formation. This highlights the need for tailored approaches that consider individual patient risk factors and the specific characteristics of the abscess. The potential long-term consequences of short-term antibiotic use, including the disruption of the gut microbiome, raise concerns about the development of dysbiosis and its associated health implications^[17]. Additionally, factors such as the method of abscess drainage and the extent of tissue involvement may influence the likelihood of fistula formation. The role of meticulous surgical technique and thorough wound debridement in preventing fistula formation should also be emphasized. The study's retrospective nature introduces the potential for selection bias and confounding variables, which may limit the ability to draw definitive conclusions about the causal relationship between antibiotic use and fistula formation. The choice between antibiotics and no antibiotics for simple anal abscesses remains complex. While the ASCRS recommends against routine antibiotic use, other guidelines, such as those from the Italian Society of Colorectal Surgery, suggest that antibiotics may decrease fistula formation^[14]. These differences highlight the ongoing debate and the need for more robust evidence to guide clinical practice. The variations in practice patterns among surgeons and the influence of local factors, such as antibiotic resistance rates, should be taken into account when interpreting the study's findings.

CONCLUSION

Our study, conducted at Colonel Lotfi Hospital, provides valuable insights into the role of antibiotics in the prevention of fistula formation following surgical treatment of simple anal abscesses. While our results suggest that routine antibiotic use may not significantly reduce the incidence of post-operative fistulas, further research is needed to identify specific patient subgroups that may benefit from targeted antibiotic therapy. Clinicians should carefully weigh the potential benefits and risks of antibiotic administration on a case-by-case basis, considering factors such as patient comorbidities, abscess characteristics, and local antibiotic resistance patterns, while emphasizing surgical precision and diligent wound care as cornerstones of post-operative management^[18]. Adherence to established guidelines, such as those from the ASCRS, is recommended, with a focus on minimizing unnecessary antibiotic exposure to mitigate the development of antibiotic resistance and other potential adverse effects. Furthermore, the study underscores the critical need for ongoing research and the development of evidence-based protocols to optimize the management of simple anal abscesses and minimize the risk of post-operative complications, fostering improved patient outcomes and enhanced quality of life.

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