International Surgery Journal
Gabsi K. Int Surg J. 2025 Feb;12(2):255-259
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: https://dx.doi.org/ 10.18203/2349-2902.isj20250159

Review Article

Risk factors for perianal abscess recurrence after incision and drainage: a review of the literature

Kheira Gabsi*

Department of Surgery, Campbelltown Hospital, Campbelltown, NSW, Australia

Received: 17 November 2024
Accepted: 10 January 2025

***Correspondence:**
Dr. Kheira Gabsi,
E-mail: kheira.gabsi@gmail.com

ABSTRACT

Perianal abscesses are a commonly managed condition by general surgery, usually with antibiotics and an incision and drainage in the operating theatre. They are estimated to recur 30% of the time. This literature review was performed to investigate risk factors for recurrence for perianal abscess. The 19 pertinent studies were included, which revealed that inflammatory bowel disease and abscess location have been repeatedly shown to be risk factors for recurrence of perianal abscess. There were numerous other risk factors including diabetes, smoking, patient age and gender, and pre-operative fever that were discussed in the literature but were not consistently between studies shown to be significant.

Keywords: Perianal abscess, Recurrence, Fistula, Risk factors

INTRODUCTION

Perianal abscess is a common presentation managed by general surgery. The incidence of perianal abscess is estimated to be approximately 16.1 per 100 000.[1] Generally, perianal abscesses are managed with an examination under anaesthesia and incision and drainage in theatres, often performed as day surgery with the patient discharged from hospital after operation. There is a risk however, of perianal abscess recurrence, often due to underlying perianal fistula or subsequent fistula formation following incision and drainage. Recurrence has been estimated to be around 30% in literature, with numerous proposed risk factors for recurrence.[2]

Most well-established risk factor for recurrence is inflammatory bowel disease, particularly Crohn's disease, due to association of Crohn's disease with fistula formation. There are many other proposed risk factors that are not well established, such as diabetes mellitus and smoking. The purpose of this literature review is to investigate further the established risk factors for perianal abscess recurrence.

LITERATURE REVIEW

A literature review was performed using the PubMed database with search terms 'perianal' AND 'abscess' AND 'recurrence' AND 'adults'. This yielded a total of 257 studies. Specifically, we were looking for original studies examining risk factors for perianal abscess recurrence and/or fistula formation after initial incision and drainage. As such, only original research articles and meta-analysis/systematic reviews were included. Studies in which the abscess was not initially managed with operative incision and drainage were excluded. After this exclusion criteria was applied, 19 studies were deemed suitable for inclusion. Studies were largely retrospective cohort studies, and there were also some systematic reviews and randomised control trials.

SUMMARY OF FINDINGS

There are numerous described risk factors in the literature for recurrence of perianal abscess after initial incision and drainage. Often, recurrence is a result of presence of perianal fistula, which may have been present at original

operation or may have subsequently developed post abscess formation and drainage. Other suspected reasons for recurrence of perianal abscess include improper surgical technique resulting in insufficient drainage at initial operation, missing locules of pus.[3] The incidence of perianal abscess recurrence is generally described to be approximately 30% of drained perianal abscess.[1,2,4-6] The most consistently described risk factors for recurrence are inflammatory bowel disease, particularly Crohn's disease.[1,2,4,7-9] Crohn's disease has been long established to be a risk factor that perianal abscess recurrence as patients are much more likely to develop fistulas. Location of the perianal abscess is also commonly described as a risk factor; inter-sphincteric and ischiorectal abscess are associated with a higher risk of recurrence.[7,8] High BMI has also been associated with higher risk of abscess recurrence.[6,10] Higher pre-operative inflammatory markers have been shown in some studies to be associated with increased risk of recurrence, including white blood cell count and C reactive protein levels as well as documented fever preoperatively.[2,8,11] The evidence suggests that post-operative antibiotic treatment has no significant effect on recurrence rates of perianal abscess.[6,12-14] There is also high-level evidence suggesting that packing of abscess cavities versus not packing has no significant impact on healing and rates of recurrence.[15-17] Some areas of controversy in the literature include patient age as a risk factor-some papers quoting older age as a predictor for recurrence, versus others quoting younger age as a risk factor; one large study found that the age group of 41-60 was most associated with recurrence.[3,5,7,15] Similarly, sex of the patient has shown varied results; female sex has been shown to be independently associated with high recurrence rates and yet another study reports recurrence to be mostly found in male patients others showing sex to have no significant association.[5-7,13,18] Diabetes mellitus is another controversial area-numerous studies have found that the presence of diabetes has no significant effect on recurrence rates, another suggesting that non- diabetics in fact had higher recurrence rates, and other studies finding that the presence of diabetes in fact increases abscess recurrence.[2,3,5,7,11,13,18] A more experienced operating surgeon was shown in one study to be significant in to improve rates of fistula identification in initial operation, although this finding has not been repeatedly demonstrated in the literature.[1,2,4,19] Another important consideration is whether fistulas found at index operation should be treated; a recent systematic review has shown that treatment of fistula at the same time as initial incision and drainage significantly reduces the recurrence or persistence of fistula or the need for repeat surgery, however, other studies have shown that overall, intra-operative search for a fistula has no impact on recurrence.[2,19,20] Some other documented risk factors for recurrence include history of recurrent perianal abscesses or previous operations, pus cultures growing *E. coli*, presence of malignancy, high abscess cavity and lack of pre-operative MRI imaging.[2,8,11] Interestingly, smoking has not been shown to be statistically significant in increasing recurrence risk except in one study.[5,9,13]

Key findings of all the pertinent papers have been listed in the following table.

Table 1: Key findings of all the pertinent papers.

Year	Paper title	Study size and type	Key findings
2001	Early reoperation for perirectal abscess: a preventable complication[3]	Retrospective cohort study, 500 patients	9.6% of patients required early reoperation. Causes were incomplete drainage, missed loculations within a drained, missed abscesses, and postoperative bleeding Risk factors for reoperation identified were greater age ($p<0.03$). The presence of diabetes, chronic steroid therapy, surgeon experience, IBD, or history of previous abscesses were not significant risk factors for early reoperation.
2004	Perianal abscess: a pilot study comparing packing with non-packing of the abscess cavity[16]	RCT, 43 patients	Post operative rates recurrence/fistula were similar between the packing and non-packing groups.
2009	Who is at risk for developing chronic anal fistula or recurrent anal sepsis after initial perianal abscess?[13]	148 patients retrospective cohort study	Age <40 associated with >2× increased risk of recurrence vs. those >40 years. Nondiabetics were 2.69x as likely to experience recurrence as diabetics ($p=0.04$). No significant differences were found in risk of recurrence were noted gender, smoking status, perioperative antibiotics, or HIV status.
2010	Incidence and factors influencing the development of fistula-in-ano after incision and drainage of perianal abscesses[5]	64 patients Retrospective cohort study	31% developed fistula following incision and drainage. Patients under 40 years and non-diabetic patients had a higher risk for developing a fistula. Patients receiving perioperative antibiotics were less likely to develop fistula. Gender, smoking status, alcohol intake, pre-operative fever; high WCC, and location of abscess were not associated with increased or decreased risk of fistula formation.
2010	Incision and drainage of perianal abscess with or without treatment of anal fistula[20]	Systematic review including 6 trials, 479 total patients	Treatment of the fistula at the same time as initial incision and drainage significantly reduces the recurrence/ persistence of fistula or the need for repeat surgery. No impact on sphincter function noted in patients who had fistula treated at index operation.

Continued.

Year	Paper title	Study size and type	Key findings
2011	The impact of specialist experience in the surgical management of perianal abscess[4]	Retrospective cohort study 147 patients	28% recurrence rate. Higher rates of recurrence in patients with IBD. Identification of an underlying fistula at time of incision and drainage was higher in the consultant group compared to the trainees (50% vs 12%, p 1⁄4 0.00001).
2011	Does adjuvant antibiotic treatment after drainage of anorectal abscess prevent development of anal fistulas? A randomized, placebo-controlled, double-blind, multicenter study[12]	RCT 151 patients	Antibiotic treatment following the drainage of an anorectal abscess has no protective effect regarding risk of fistula formation.
2017	Natural history of anorectal sepsis[7]	Analysis of hospital episode tatistics (HES) data set-158 713 patients	Predictors for fistula development were female sex, age 41-60 years, and ischiorectal or inter-sphincteric location of the initial abscess. Presence of IBD was also very strongly associated with a higher risk of fistula. Diabetes was not associated with increased risk of fistula formation
2020	Can the risk of anal fistula development after perianal abscess drainage be reduced?[10]	Retrospective cohort study, 244 patients	Patient divided into two groups-comparing at home dressings vs. in hospital. Fistula development at 3 months was significantly more frequent in patients with at-home dressings than it was in the patients with at-hospital dressings. BMI >30 was associated with increased risk of fistula formation in both groups.
2021	Incidence and risk factors affecting development of perianal fistulas after drainage of perianal abscesses[18]	Retrospective cohort study, 131 patients	No statistically significant risk factors-including gender, smoking, location of abscess, postoperative antibiotics age. There was a 13.2% increased proportion of nondiabetics to develop perianal fistulas as compared to diabetics (32 vs. 19%), but it was not found to be statistically significant (p=0.236).
2022	Reviewing perianal abscess management and recurrence: lessons from a trainee perspective[2]	Retrospective cohort study 78 patients	Abscess recurrence rate was 31% 1/3 of all abscess patients had IBD, diabetes, or malignancy → increased the risk of subsequent fistula formation or abscess recurrence (p=0.01). Patients with documented fever (T>38) in the emergency department had a significantly higher risk of recurrence (p=0.04). The intra-operative search for a fistula did not reduce recurrence
2022	Postoperative packing of perianal abscess cavities: randomized clinical trial[17]	RCT, 433 patients	Post operative rates of fistula and abscess recurrence were similar between the packing and non-packing groups. Post-operative packing caused increased pain.
2023	Study on the factors influencing the prognosis after perianal abscess surgery[11]	394 patients retrospective review	Patients were divided into “cured” or “uncured”, with uncured group referring to patients who had subsequent formation of anal fistula or recurrence of abscess. Abscess cavity size increased risk of recurrence. Diabetes had no significant impact on recurrence rates. Pre-op WCC in uncured group was higher than in cured group. Rate of high abscess space in uncured group was higher. More patients in the cured group underwent pre-op MRI
2023	Fistula development after anal abscess drainage-a multicentre retrospective cohort study[8]	Retrospective cohort study 475 patients	34.5% diagnosed with fistula within follow-up period. Risk factors for developing fistulas were low intersphincteric and ischioanal abscesses, Crohn’s disease (OR 5.96, 95 CI 2.33-17.2), H/O recurrent anal abscesses or repeat surgery, *E. coli*-positive pus cultures, preop CRP levels >100 mg/l
2023	Incidence of anal fistula after pyogenic perianal abscess drainage in Kingdom of Bahrain[6]	Retrospective cohort study 109 patients	33.9% of patients who had an abscess drained developed a fistula. 86.3% of recurrences occurred in males, 13.6% in females. Socioeconomic status was significantly related to fistula development. No association between use of antibiotics and risk of developing a fistula or recurrence of abscess was found.
2024	Systematic review and meta-analysis of use of packing in management of perianal abscesses[15]	Meta-analysis of 3× systematic reviews 490 patients	Evidence shows that there is no significant benefit to packing abscess cavities
2024	Antibiotic treatment has no influence on anal fistula formation and recurrent perianal abscess after incision and drainage of cryptogenic perianal abscess: a randomized single-blinded prospective study[14]	Prospective study 98 patients	Post-operative treatment with antibiotics did not decrease recurrence of abscess or rates of development of fistula.

Continued.

Year	Paper title	Study size and type	Key findings
2024	Characterization of risk factors affecting the recurrence of perianal abscesses and complications[9]	Retrospective cohort study, 983 patients	Crohn's disease and smoking were found to be associated with a higher rate of recurrence
2024	Management of acute perianal abscess: is surgeon specialization associated with improved outcomes?[19]	Retrospective cohort Study, 408 patients.	Colorectal surgeon vs. general surgeons performing initial operation did not significantly change rates of recurrence or fistula formation. CR surgeons were more likely to find and treat underlying fistulas at initial operation, but this did not result in improved outcomes

CONCLUSION

Crohn's disease is a well-established risk factor for recurrence of perianal abscess, as is inter- sphincteric or ischiorectal location of abscess cavity. There are many other proposed risk factors for recurrence including diabetes, smoking, high pre-operative inflammatory markers, fevers, gender and age of patient, however these risk factors have not been consistently demonstrated in the literature. Post-operative packing of the abscess cavity and use of post-operative antibiotics do not decrease recurrence rates. More research is required to further characterise risk factors for recurrence and fistula formation after incision and drainage of perianal abscesses.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

REFERENCES

1. Sahnan K, Adegbola SO, Tozer PJ, Josef W, Robin KP. Perianal abscess. BMJ. 2017;21:j356.
2. Sarofim M, Ooi K. Reviewing perianal abscess management and recurrence: lessons from a trainee perspective. ANZ J Surg. 2022;92(7-8):1781-3.
3. Onaca N, Hirshberg A, Adar R. Early reoperation for perirectal abscess: a preventable complication. Dis Colon Rectum. 2001;356:1469-73.
4. Malik A, Hall D, Devaney R, Sylvester H, Yalamarthi S. The impact of specialist experience in the surgical management of perianal abscesses. Int J Surg. 2011;9(6):475-7.
5. Lohsiriwat V, Yodying H, Lohsiriwat D. Incidence and factors influencing the development of fistula-in-ano after incision and drainage of perianal abscesses. Med J Med Assoc Thailand. 2010;93(1):61.
6. Hasan ZA, Mohamed B, AlSayegh R, AlMarzooq R. Incidence of anal fistula after pyogenic perianal abscess drainage in Kingdom of Bahrain. Ann Coloproctol. 2023;39(1):27.
7. Sahnan K, Askari A, Adegbola SO, Tozer PJ, Phillips RK, Hart A, et al. Natural history of anorectal sepsis. J Brit Surg. 2017;104(13):1857-65.
8. Skovgaards DM, Perregaard H, Dibbern CB, Nordholm-Carstensen A. Fistula development after anal abscess drainage-a multicentre retrospective cohort study. Int J Colorectal Dis. 2023;39(1):4.
9. Barkai O, Abramov R, Harbi A, Gilshtein H. Characterization of risk factors affecting the recurrence of perianal abscesses and complications. Israel Med Assoc J. 2024;26(7):428-33.
10. Gokce FS, Gokce AH. Can the risk of anal fistula development after perianal abscess drainage be reduced? Rev Assoc Méd Brasileira. 2020;66:1082-6.
11. Dong S, Chen B, Zhang J. Study on the factors influencing the prognosis after perianal abscess surgery. BMC Gastroenterol. 2023;23(1):334.
12. Sözener U, Gedik E, Aslar AK, Ergun H, Elhan AH, Memikoglu O, et al. Does adjuvant antibiotic treatment after drainage of anorectal abscess prevent development of anal fistulas? A randomized, placebo-controlled, double-blind, multicenter study. Dis Colon Rectum. 2011;54(8):923-9.
13. Hamadani A, Haigh PI, Liu IL, Abbas MA. Who is at risk for developing chronic anal fistula or recurrent anal sepsis after initial perianal abscess? Dis Colon Rectum. 2009;52(2):217-21.
14. Nasasra A, Hershkovitz Y, Ashkenazi I, Hammerschlag J, Zmora O, Jeroukhimov I. Antibiotic Treatment Has No Influence on Anal Fistula Formation and Recurrent Perianal Abscess After Incision and Drainage of Cryptogenic Perianal Abscess: A Randomized Single-Blind Prospective Study. Dis Colon Rectum. 2024;67(8):1072-6.
15. Crook DL, Padfield OM. A systematic review and meta-analysis of the use of packing in the management of perianal abscesses. Ann R Coll Surg Engl. 2024;107(1):29-34.
16. Tonkin DM, Murphy E, Brooke-Smith M, Hollington P, Rieger N, Hockley S, Richardson N, Wattchow DA. Perianal abscess: a pilot study comparing packing with nonpacking of the abscess cavity. Dis Colon Rectum. 2004;47(9):1510-4.
17. Newton K, Dumville J, Briggs M, Law J, Martin J, Pearce L, et al. Postoperative packing of perianal abscess cavities (PPAC2): randomized clinical trial. Brit J Surg. 2022;109(10):951-7.
18. Khalil OM, Al Ozaibi L, Kaiyasah HM, Hejazi NA. Incidence and risk factors affecting development of perianal fistulas after drainage of perianal abscesses. Dubai Med J. 2021;4(1):43-6.
19. Turner GA, Tham N, Chandra R, Read DJ, Chittleborough TJ, McCormick JJ, et al. Management of acute perianal abscess: is surgeon

specialization associated with improved outcomes? ANZ J Surg. 2024;94(5):938-44.
20. Malik AI, Nelson RL, Tou S. Incision and drainage of perianal abscess with or without treatment of anal fistula. Coch Datab Systemat Rev. 2010;7:CD006827.

Cite this article as: Gabsi K. Risk factors for perianal abscess recurrence after incision and drainage: a review of the literature. Int Surg J 2025;12:255-9.