Bedside Drainage of Perianal Abscesses: Is It Safe and Effective?

Michael Goldenshluger MD[1], Carmel Margalit BSc[2], Afek Kodesh MS4[2], Ephraim Katz MD[1], David Hazzan MD[1], and Lior Segev MD[1]

[1]Department of General Surgery C, Sheba Medical Center, Tel Hashomer, Israel
[2]Faculty of Medicine, Tel Aviv University, Tel Aviv, Israel

ABSTRACT **Background:** Perianal abscesses require immediate incision and drainage (I&D). However, prompt bedside drainage is controversial as it may compromise exposure and thorough anal examination.

Objectives: To examine outcomes of bedside I&D of perianal abscesses in the emergency department (ED) vs. the operating room (OR).

Methods: We conducted a retrospective review of all patients presented to the ED with a perianal abscesses between January 2018 and March 2020. Patients with Crohn's disease, horseshoe or recurrent abscesses were excluded.

Results: The study comprised 248 patients; 151 (60.89%) underwent I&D in the OR and 97 (39.11%) in the ED. Patients elected to bedside I&D had smaller abscess sizes (P = 0.01), presented with no fever, and had lower rates of inflammatory markers. The interval time from diagnosis to intervention was significantly shorter among the bedside I&D group 2.13 ± 2.34 hours vs. 10.41 ± 8.48 hours (P < 0.001). Of patients who underwent I&D in the OR, 7.3% had synchronous fistulas, whereas none at bedside had (P = 0.007). At median follow-up of 24 months, recurrence rate of abscess and fistula formation in patients treated in the ED were 11.3% and 6.2%, respectively, vs. 19.9% and 15.23% (P = 0.023, 0.006). Fever (OR 5.71, P = 0.005) and abscess size (OR 1.7, P = 0.026) at initial presentation were risk factors for late fistula formation.

Conclusions: Bedside I&D significantly shortens waiting time and does not increase the rates of long-term complications in patients with small primary perianal abscesses.

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KEY WORDS: abscess recurrence, bedside drainage, perianal abscess, perianal fistula

Perianal abscesses are one of the most common surgical emergency conditions encountered in the emergency department (ED) [1]. However, there is a considerable variation in the management and treatment of anorectal abscesses [2]. The definitive treatment of perianal abscess is surgical incision and drainage (I&D), which is routinely performed under general or regional anesthesia in the operating room (OR) [3,4]. Early and aggressive treatment of perianal abscess has been shown to reduce recurrence rate [5]. Despite a clear recommendation to operate as quickly as possible, no association has been proven between the time interval from abscess diagnosis until its drainage and the risk of possible complications [6].

The appropriate setting for abscess drainage depends on the location of the abscess, the clinical presentation, and the experience of the clinician. A simple, superficial abscess may be suitable for bedside drainage in the ED or hospital ward [1]. Simple abscesses are characterized by perianal pain and swelling, while fever and drainage are less common [7]. Patients requiring internal drainage, with recurrent or bilateral disease, large or deep abscesses, Crohn`s disease, or with systemic signs of sepsis are all at risk for inadequate bedside drainage and may benefit from drainage in an OR under general or regional anesthesia. Examination under anesthesia (EUA) allows a thorough examination to help ensure optimal diagnosis and care [8]. The major complications of anal abscess include abscess recurrence, chronic anal fistula, and pelvic sepsis. Recurrence is deemed secondary to inadequate drainage and may be more common when drainage is delayed [3,9].

Until recently, perianal abscess surgical drainage at our institution was performed almost solely under general anesthesia in the OR. However, the rate of abscesses treated bedside by the surgeon in the ED has steadily increased following training and authorization of surgical teams in the sedation foundations. As a result, the treatment for perianal abscesses in the ED has become dependent on the discretion of the surgical resident. Some physicians prefer to wait for the availability of the OR and perform examination under general anesthesia, whereas others prefer local drainage bedside in the ED under sedation or local anesthesia.

Most of the patients treated in the ED are discharged from the hospital within a few hours without requiring hospital admission or waiting for an available OR. However, ED procedures are usually performed in a suboptimal position when the patient is in a lateral or prone position and not in the preferred lithotomy position, as is used in the OR. Furthermore, treatment in the ED does not allow for effective anoscopy and is time limited.

The purpose of this single-center retrospective study was to examine whether perianal abscess bedside drainage in the ED is a safe and effective treatment, which is not associated with increased anorectal and systemic morbidity.

PATIENTS AND METHODS

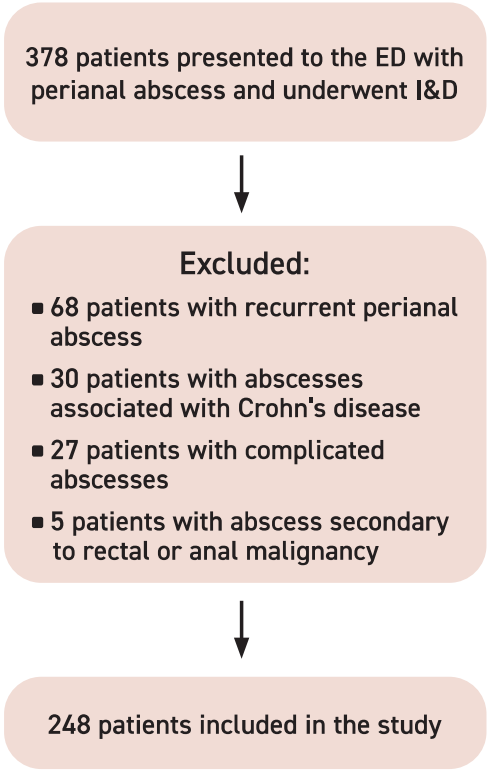
STUDY DESIGN

This retrospective analysis included all patients who underwent I&D for a perianal abscess at a single institution between January 2018 and March 2020. The data for the study were extracted from the electronic medical records after approval of the institutional review board.

STUDY COHORT

Records of all 378 patients who underwent I&D for perianal abscess were assessed. The inclusion criteria were adults who presented with primary perianal abscess and underwent I&D by a surgical team in the ED or OR. The exclusion criteria were recurrent or horseshoe abscesses, past or present medical history of Crohn's disease, and age younger than 18 years. In addition, patients who initially presented with recurrent abscess, chronic anal fistula, or non-cryptoglandular infection were excluded (e.g., due to malignancy, obstetric trauma, or sexually transmitted disease) [Figure 1].

Figure 1. Cohort chart



ED = emergency department, I&D = incision and drainage

TECHNICAL DESCRIPTION

All patients referred to the surgeon in the ED underwent evaluation by a senior surgical resident (postgraduate year 5/6) who decided whether the drainage would be performed bedside in the ED or in the OR based on their clinical discretion. The size of the abscess was determined based on the description recorded by the surgeon in the electronic medical records(EMR) system, either as small, medium, or large, or by its actual size if noted. Abscesses with a diameter size less than 2 cm were considered small, 2–4 cm as medium, and > 4 cm as large. All procedures in the OR were performed under general anesthesia in the lithotomy position. The patients who were treated bedside in the ED received sedation and/or local anesthesia and were drained in the lateral decubitus or prone positions. All patients were treated with broad spectrum antibiotics before the drainage. After receiving anesthesia, patients in both groups underwent incision over the point of maximal tenderness with drainage and lavage of the abscess cavity. In the case of a synchronous perianal fistula, no fistulotomy was performed and the fistula track was marked with a loose seton for future consideration.

STATISTICS

Statistical analyses were performed using IBM Statistical Package for the Social Sciences statistics software, version 25 (SPSS, IBM Corp, Armonk, NY, USA). Numerical variables were presented as means and standard deviations. Categorical variables were presented as proportions. All numerical variables were tested for normality using the Kolmogorov-Smirnov test. Differences between the groups were calculated by Mann-Whitney for non-parametric numerical variables and with independent *t*-test for numerical variables with normal distribution. The chi-square test was used for categorical variables. Multivariate analysis was performed for anal fistula risk factors according to the results in univariate analysis and was adjusted for age, sex, and presence of diabetes mellitus.

RESULTS

The study comprised 248 patients; 151 patients (60.89%) were drained in the OR and 97 (39.11%) in the ED. The baseline characteristics of the patients are described in detail in Table 1. The average age was 44.75 ± 17 years (range 18–87) with no significant difference between the groups. In the cohort, 71% of the patients were male. Most of the patients (79%) were diagnosed by a clinical exam with no computed tomography scan. Only 29 patients (11.7%) presented with systemic fever. The size of the

Table 1. Baseline characteristics

	Overall cohort, n=248	OR I&D, n=151	Bedside I&D, n=97	*P*-value
Age in years	44.75 ± 17.14	46.51 ± 17.11	41.99 ± 16.89	0.779
Male (%)	176 (71)	114 (75.5)	62(63.9)	**0.035**
Co-morbidities				
Cardiovascular disease	22 (8.9)	19 (12.6)	3(3.1)	**0.003**
Hypertension	43 (17.3)	32 (21.12)	11(11.3)	**0.046**
Diabetes mellitus	23 (9.3)	19 (126)	4(4.1)	**0.025**
Malignancy	14 (5.6)	14 (9.3)	0 (0)	**0.002**
Immunosuppression	12 (4.8)	9 (6)	3 (3.1)	0.304
Diagnosis by CT	52 (21)	50 (33.1)	2 (2.1)	**< 0.001**
Temperature > 38°C	29 (11.7)	28 (18.5)	1(0.4)	**< 0.001**
Abscess size (n= 39, 93)	n=232	n=139	n=93	**< 0.001**
1 (< 2 cm)	136 (58.64)	60 (43.16)	76 (81.72)	
2 (2–4 cm)	49 (21.12)	40 (28.78)	9 (18.4)	
3 (> 4 cm)	47 (20.3)	39 (28.1)	8 (17.01)	
WBC (mean ± SD)	11.54 ± 3.78, n=184	11.84 ± 3.89, n=144	10.45 ± 3.21, n=40	**0.05**
CRP (mean ± SD)	57.01 ± 58.51, n=184	64.72 ± 61.89, n=144	29.27 ± 33.15, n=40	**< 0.001**
Time from surgical exam to I&D (hours, mean ± SD)	7.19 ± 7.86	10.42 ± 8.48	2.22 ± 2.35	**< 0.001**
Type of anesthesia				**< 0.001**
General (%)	151 (60.89)	151 (100)	0 (0)	
Sedation (%)	22(8.9)	0 (0)	22(22.7)	
Local (%)	75 (30.2)	0 (0)	75 (77.3)	
Discharge with antibiotics	150 (64.1)	80 (50.3)	70 (84.3)	**< 0.001**
Length of antibiotic treatment after I&D (days, mean ± SD)	6.11 ± 1.51	4.56 ± 3.01	3.23 ± .24	**0.003**
Length of stay in the hospital (days, mean ± SD)	0.68 ± 0.87	1.12 ± 0.87	0	**< 0.0001**
Disposition after procedure				**< 0.0001**
Admission	151 (60.89)	151 (100)	0	
Discharge home	97 (39.11)	0	97 (100)	

CRP = C-reactive protein, CT = computed tomography, I&D = incision and drainage, OR = operating room, SD = standard deviation, WBC = white blood cell count

Bold signifies significance

perianal abscess was described as less than 2 cm in 58% of the patients, 2–4 cm in 21%, and > 4 cm in 20.3%. Laboratory exams showed mild leukocytosis (mean 11.54 ± 3.78 K/microliter) and elevated C-reactive protein (CRP) (mean 57.01 ± 58.51 mg/liter).

The ED group included fewer women (24.5% vs. 36.1%, $P = 0.035$) and fewer patients with significant co-morbidities (cardiovascular disease 3.1% vs. 12.6%, $P = 0.003$; diabetes mellitus 4.1% vs. 12.58%, $P = 0.025$). Only one patient (0.4%) in the ED group presented with systemic fever vs. 28 (18.5%) in the OR group. The patients who were drained in the ED had significantly smaller abscess sizes ($P < 0.001$) and decreased inflammatory markers, including CRP and WBC ($P = 0.05$ and $P < 0.001$, respectively). The I&D in the ED was performed either with local anesthesia (n=75, 77.3%) or sedation (n=22, 22.7%). All the patients who underwent I&D in the OR received general anesthesia.

The patients who underwent I&D in the OR had to wait significantly longer for the procedure: 10.42 ± 8.48 hours vs. 2.22 ± 2.35 hours in the ED group ($P < 0.01$). However, the time interval to drainage was not found to be a significant factor influ-

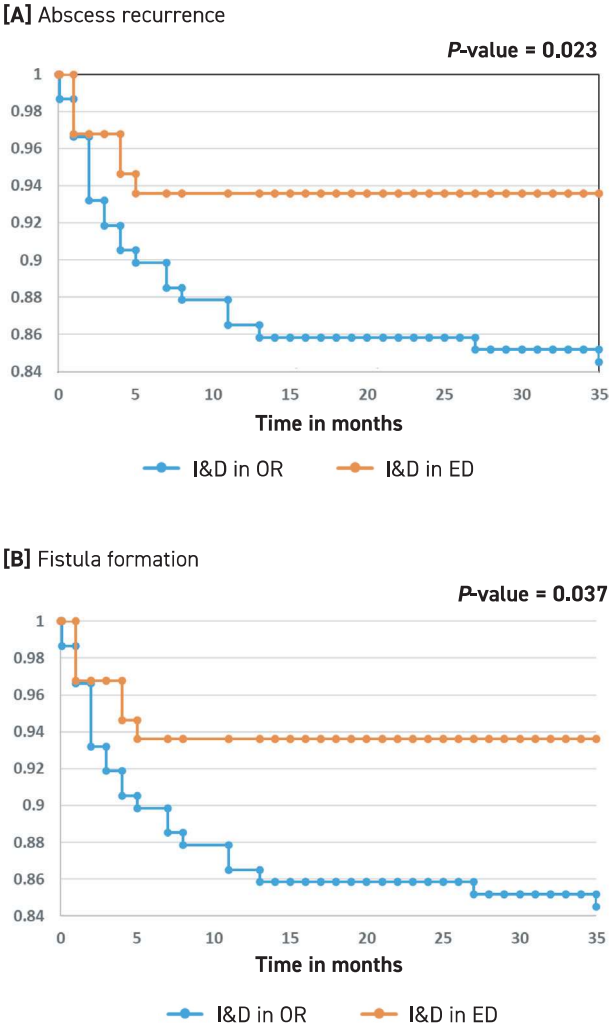
Table 2. Outcomes

	Overall cohort n=248 (%)	OR I&D n=151(%)	Bedside I&D n=97(%)	*P*-value
Immediate complications	8 (3.3)	6 (4.1)	2 (2.1)	0.391
Early recurrent abscess (< 30 days)	19 (7.66)	12 (7.9)	7 (7.2)	0.519
Late recurrent abscess (>30 days)	41 (16.5)	30 (19.9)	11 (11.3)	**0.031**
Synchronous fistula	11(4.4)	11 (7.3)	0 (0)	**0.004**
Late fistula (> 30 days after abscess drainage)	29 (11.69)	23 (15.23)	6 (6.2)	**0.006**

I&A = incision and drainage

Bold signifies significance

Figure 2. Abscess and fistula recurrence



ED = emergency department, I&D = incision and drainage, OR = operating room

encing abscess recurrence or increased risk for perianal fistula development. All the patients after OR drainage with general anesthesia were discharged one day after the procedure, whereas none of the patients in the ED group were admitted after the procedure. Synchronous fistulas were found during I&D only in the OR group (11 patients, 7.3%).

Immediate complications including bleeding, urinary retention, and syncope were found in 6 patients (4.1%) in the OR group and 2 patients (2.1%) in the ED group ($P = 0.391$). No differences were recorded between the groups with regard to early recurrence (< 30 days) of abscess after I&D: 7 patients in the ED group (7.2%) and 12 patients in the OR group (7.9%), $P = 0.519$. Late abscess recurrence and fistula formation, with a median follow-up of 2 years, were much more frequent in the OR drainage group ($P = 0.023$ and $P = 0.006$, respectively) [Figure 2].

Univariate analysis found abscess size and systemic temperature (> 38°C) as major risk factors for fistula formation following perianal I&D (OR 1.7, $P = 0.026$ for abscess size and OR 5.99, $P = 0.001$ for temperature). Multivariate analysis adjusted to age, sex, and diabetes mellitus found systemic temperature higher than 38°C was the main risk factor for future fistula formation (OR 5.71, $P = 0.005$).

DISCUSSION

Perianal abscesses should be treated in a timely fashion by I&D, usually under general or regional anesthesia in the OR [1,3,8,10]. The aim of this study was to examine the safety and efficacy of prompt bedside I&D of perianal abscess in the ED compared to drainage in the OR. Our findings demonstrated that selective patients with small perianal abscesses and without systemic inflammatory markers can safely undergo bedside drainage with no increased risk for abscess recurrence or fistula formation. Although the practice of bedside drainage of perianal abscess in the ED or the office is common [1,8-11], to the best of our knowledge, this report is the first to formally describe the daily ED routine of bedside vs. OR drainage procedures and its long-term results.

The baseline characteristics of the patients included in this

study were similar to those mentioned in published literature [12,13]. The male dominance in our study (71%) was similar to the previously published twofold to fourfold incidence of perianal abscesses in men vs. women [12]. The mean age 44.75 ± 17.14 years was also in agreement with the known peak incidence of abscesses in the fifth decade of life [2,8,9].

Anorectal abscesses were previously classified based on their location relative to the anal verge [9]. Our study deals mainly with the perianal location of the abscesses. In other words, it is with consideration to the superficial infections that extend between the internal and external sphincter and reach the anal verge [9,14].

The supporters of abscess drainage in the OR claim that it allows for proper anal examination under anesthesia and for detection of perianal fistula opening. This procedure allows for subsequent possible fistulotomies or fistula markings with loose seton insertions [1,4,15]. However, it also necessitates a hospital admission and general or regional anesthesia, which requires at least 12 hours of recovery. The results from our hospital demonstrate that this situation amounts to almost five times longer waiting times for the OR procedure compared to bedside drainage (10.42 ± 8.48 vs. 22 ± 2.35 hours). However, bedside procedures usually do not allow proper visualization of the anal canal and are limited in time and extent of the incision, which is often due to the relative ineffectiveness of local anesthesia. We did not find the waiting time for the procedure to be a significant factor for complications; however, the extended waiting time for the procedure that provided immediate relief and resolution of the pain affected the wellbeing of the patients. The groups in this study, patients with perianal abscess who were drained in the ED vs. in the OR, were different in many aspects. The ED patients were healthier, had smaller abscesses, had decreased body temperatures, and did not have increased inflammatory laboratory markers. These differences illuminate the discretion of the surgeons in the ED preferring OR exploration in high-risk patients. Based on our results, this discretion provided relatively safe results for the patients treated bedside in the ED. Only 7% presented with recurrent abscesses, which necessitated repeated I&D, and only 6.2% developed late perianal fistulas compared to 15.23% of the patients treated in the OR (P = 0.006). Those relatively low rates of abscess recurrences and late perianal fistulas seen in the ED group differ significantly from the previously described rates of up to 44% perianal recurrences [16,17] and probably related to the low-risk patients who were selected to be treated in this group. Diabetes mellitus, inadequate drainage, Crohn's disease, presence of an associated anal fistula, horseshoe abscess, and age under 40 years were all found to be associated with an elevated risk of abscess recurrence. Obesity, history of smoking, sex, and human immunodeficiency virus were not [2,7,12,18]. To the best of our knowledge, abscess size and systemic temperature have not been included in previous analyses of risk factors for perianal fistula. We have found those factors to be influential in univariate and multivariate analysis adjusted to age, sex, and diabetes mellitus. Those obvious clinical symptoms revealed the severity of the local and systemic infection. In fact, the presence of systemic temperature above 38°C increased the risk for perianal fistula by 5.71 times and abscesses larger than 2 cm increased the odds for fistula by 1.71 times.

Our institutional policy is to avoid fistulotomies during perianal abscess drainage; however, if a fistula opening is clearly seen, we insert a loose seton device for further follow-up by the colorectal team. Perianal fistula was found only in the group treated in the OR: 11 cases (7.3%) vs. 0 patients in the ED group. That result might be related to the fact that the patients who underwent bedside drainage did not undergo proper examination and visualization of the anal canal or that the patient selection process for the bedside drainage was correct at most times and that physicians selected the simpler patients for this procedure. Previous studies showed higher percentages of synchronous fistulas 26–37% [1,13,14]. Malik and colleagues [15] added that the rate of synchronous fistulas at presentation of perianal abscess was influenced by the level of experience of the operator which is also relevant to our cohort.

The use of antibiotics after perianal abscess drainage is still controversial. Mocanu and co-authors [19] supported routine use of antibiotics following perianal abscess drainage with a 36% lower rate of fistula formation; however, the authors mentioned that the level of their evidence was low. In our practice we do not use postoperative antibiotics routinely. A course of 5–10 days of antibiotics is usually given in more complicated cases, such as patients with systemic inflammatory response, cellulitis, or larger abscesses. Our data showed that 84% of patients in the OR drainage group were discharged with antibiotics compared to only 50% of the patients who underwent bedside drainage in the ED [Table 1].

Our study has limitations. First, in this retrospective study data were collected from an EMR. Second, we collected the data from our institution only. Patients who were re-admitted or treated with complications in other institutions may have been missed. We analyzed our data based on the size of the abscess at presentation as they were recorded in the EMR. However, it is important to note that this size was only a subjective evaluation and may not be the accurate size measured in each patient. Considering those limitations, we believe this study is important as it impacts the daily practice of bedside and OR perianal abscess treatment.

CONCLUSIONS

Bedside incision and drainage is a safe and effective treatment for patients with small primary perianal abscesses. It can significantly reduce waiting time and is not associated with higher rates of long-term complications compared to patients treated in the operating room.

Correspondence

Dr. M. Goldenshluger
Dept. of Surgery C, Sheba Medical Center, Tel Hashomer 52621, Israel
Phone: (972-3) 530-2714
Fax: (972-3) 534-1562
Email: michael.goldenshluger@sheba.health.gov.il; goldenshluger@gmail.com

References

1. Abcarian H. Anorectal infection: abscess-fistula. *Clin Colon Rectal Surg* 2011; 24 (1): 14-21.
2. Arroyo-Martinez Q, Pedro DCG, Pozo EP Del, Martinez-Nuñez S, Padillo-Ruiz FJ, Juan FD la P De. Manejo urgente de los abscesos perianales. Una tarea aún pendiente. *Cir y Cir* 2020; 88 (6): 690-7. [English]
3. Ommer A, Herold A, Berg E, Fürst A, Sailer M, Schiedeck T. German S3 guideline: anal abscess *Int J Colorectal Dis* 2012; 27 (6): 831-7.
4. Amato A, Bottini C, De Nardi P, et al. Evaluation and management of perianal abscess and anal fistula: SICCR position statement. *Tech Coloproctol* 2020; 24 (2): 127-43.
5. Ramanujam PS, Prasad LM, Abcarian H, Tan AB. Anal abscesses and fistulas. A study of 1023 patients. *Dis Colon Rectum* 1984; 27 (9): 593-7.
6. Hasan ZAIY, Mohamed B, AlSayegh R, AlMarzooq R. Incidence of anal fistula after pyogenic perianal abscess drainage in Kingdom of Bahrain. *Ann Coloproctol* 2023; 39 (1): 27-31.
7. Vogel JD, Johnson EK, Morris AM, et al. Clinical practice guideline for the management of anorectal abscess, fistula-in-ano, and rectovaginal fistula. *Dis Colon Rectum* 2016; 59 (12): 1117-33.
8. Whiteford MH. Perianal abscess/fistula disease. *Clin Colon Rectal Surg* 2007; 20 (2): 102-9.
9. Sneider EB, Maykel JA. Anal abscess and fistula. *Gastroenterol Clin North Am* 2013; 42 (4): 773-84.
10. Whiteford MH, Kilkenny J, Hyman N, et al. Practice parameters for the treatment of perianal abscess and fistula-in-ano (revised). *Dis Colon Rectum* 2005; 48 (7): 1337-42.
11. Malik AI, Nelson RL, Tou S. Incision and drainage of perianal abscess with or without treatment of anal fistula. *Cochrane Database Syst Rev* 2010; (7): CD006827.
12. Hamadani A, Haigh PI, Liu ILA, 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.
13. Ramanujam PS, Prasad ML, Abcarian H, Tan AB. Perianal abscesses and fistulas. A study of 1023 patients. *Dis Colon Rectum* 1984; 27 (9): 593-7.
14. Vasilevsky CA, Gordon PH. The incidence of recurrent abscesses or fistula-in-ano following anorectal suppuration. *Dis Colon Rectum* 1984; 27 (2): 126-30.
15. 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.
16. Wright WF. Infectious diseases perspective of anorectal abscess and fistula-in-ano disease. *Am J Med Sci* 2016; 351 (4): 427-34.
17. Rizzo JA, Naig AL, Johnson EK. Anorectal abscess and fistula-in-ano: evidence-based management. *Surg Clin North Am* 2010; 90 (1): 45-68.
18. Adamo K, Sandblom G, Brännström F, Strigård K. Prevalence and recurrence rate of perianal abscess–a population-based study, Sweden 1997–2009. *Int J Colorectal Dis* 2016; 31 (3): 669-73.
19. Mocanu V, Dang JT, Ladak F, et al. Antibiotic use in prevention of anal fistulas following incision and drainage of anorectal abscesses: a systematic review and meta-analysis. *Am J Surg* 2019; 217 (5): 910-17.

If they give you ruled paper, write the other way.

Juan Ramon Jimenez (1881–1958), Spanish poet, a prolific writer who received the Nobel Prize in Literature in 1956

Act as if what you do makes a difference. It does.

William James (1842–1910), American philosopher, historian, and psychologist

Capsule

Transcatheter repair for patients with tricuspid regurgitation

Severe tricuspid regurgitation is a debilitating condition that is associated with substantial morbidity and often with poor quality of life. Decreasing tricuspid regurgitation may reduce symptoms and improve clinical outcomes in patients with this disease. **Sorajja** and colleagues conducted a prospective randomized trial of percutaneous tricuspid transcatheter edge-to-edge repair (TEER) for severe tricuspid regurgitation. A total of 350 patients were enrolled; 175 were assigned to each group. The mean age of the patients was 78 years, and 54.9% were women. The results for the primary endpoint favored the TEER group (win ratio, 1.48; 95% confidence interval 1.06–2.13, $P = 0.02$). The incidence of death or tricuspid-valve surgery and the rate of hospitalization for heart failure did not appear to differ between the groups. The KCCQ quality-of-life score changed by a mean of 12.3 ± 1.8 points in the TEER group, compared with 0.6 ± 1.8 points in the control group ($P < 0.001$). At 30 days, 87.0% of the patients in the TEER group and 4.8% of those in the control group had tricuspid regurgitation of no greater than moderate severity ($P < 0.001$). TEER was found to be safe; 98.3% of the patients who underwent the procedure were free from major adverse events at 30 days.

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Eitan Israeli