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Watchful Waiting After Radiological Guided Drainage of Intra-abdominal Abscess in Patients With Crohn's Disease Might Be Associated With Increased Rates of Stoma Construction

Alaa El-Hussuna, PhD,¹ Casper Steenholdt, DMSc,² Mette Louise Merrild Karer, MD,³ Natasja Nyggard Uldall Nielsen, MD,³ Angela Mujukian, MD,⁴ Phillip R. Fleshner, PhD,⁴ Igors Iesalnieks, MD,⁵ Nir Horesh, MD,⁶ Uri Kopylov, PhD,⁶ Harel Jacoby, MD,⁶ Haider Mahmoud Al-Qaisi, MD,⁷ Francesco Colombo, MD,⁸ Gianluca M. Sampietro, MD,^{8,9} Marco V. Marino, MD,¹⁰ Mark Ellebæk, PhD,¹¹ Nina Sørensen, MD,⁷ Valerio Celentano, MD,¹² Nikhil Ladwa, MD,¹³ Janindra Warusavitarne, MD,¹³ Gianluca Pellino, PhD,^{14,15} Aurang Zeb, MD,¹⁶ Francesca Di Candido, MD,¹⁷ Luis Hurtado-Pardo, MD,¹⁸ Matteo Frasson, PhD,¹⁸ Lumir Kunovsky, MD,^{19,20,21} Ali Yalcinkaya, MD,²² Sandra Alonso, MD,²³ Miguel Pera, PhD,²³ Cristina Antón Rodríguez, PhD,²⁴ Ana-Minaya Bravo, MD,^{24,25} Alvaro Garcia Granero, MD,²⁶ Ozan Can Tatar, MD,²⁷ Antonino Spinelli, PhD,¹⁷ and Niels Qvist, DMSc¹¹ and On behalf of the OpenSourceResearch Collaboration

¹OpenSourceResearch Collaboration, Aalborg, Denmark

²Department of Gastroenterology, Herlev Hospital, Herlev, Denmark

³Department of Surgery, Aalborg University, Aalborg, Denmark

⁴Department of Surgery, Cedars-Sinai Medical Center, Los Angeles, California, USA

⁵Department of Surgery, Städtisches Klinikum München Bogenhausen, Munich, Germany

⁶Sheba Medical Center, Sackler Medical School Tel Aviv University, Ramat Gan, Israel

⁷Department of Surgery, Aalborg University Hospital, Aalborg, Denmark

⁸Division of General and HPB Surgery, Luigi Sacco Hospital, Milano, Italy

⁹Surgery, Università degli Studi di Milano, Milan, Italy

¹⁰Azienda Ospedaliera Ospedali Riuniti Villa Sofia-Cervello, Palermo, Italy

¹¹Research Unit for Surgery and IBD-Care, Odense University Hospital, University of Southern Denmark, Odense, Denmark

¹²Chelsea and Westminster Hospital NHS Foundation Trust, London, UK

¹³Department of Surgery, St Mark's and Northwick Park Hospital, London, UK

¹⁴Colorectal Surgery, Vall d'Hebron University Hospital, Barcelona, Spain

¹⁵Department of Advanced Medical and Surgical Sciences, Università degli Studi della Campania "Luigi Vanvitelli," Naples, Italy

¹⁶Department of Surgery, Hvidovre Hospital, Hvidovre, Denmark

¹⁷Department of Biomedical Sciences, IRCCS Humanitas Research Hospital, Humanitas University, Milan, Italy

¹⁸Department of Surgery, University Hospital La Fe, University of Valencia, Spain

¹⁹Department of Surgery, Faculty of Medicine, University Hospital Brno, Masaryk University, Brno, Czech Republic

²⁰Department of Gastroenterology and Digestive Endoscopy, Masaryk Memorial Cancer Institute, Brno, Czech Republic

²¹Department of Internal Medicine – Gastroenterology and Geriatrics, University Hospital Olomouc, Faculty of Medicine and Dentistry, Palacky University Olomouc, Olomouc, Czech Republic

²²Faculty of Medicine, Gazi University, Ankara, Turkey

²³Department of Surgery, Hospital del Mar, Spain

²⁴Medicine Faculty, Universidad Francisco de Vitoria, Madrid, Spain

²⁵Colorectal Surgery Unit, Hospital Universitario, Madrid Del Henares, Spain

²⁶Colorectal Surgery Unit, Hospital Universitario Son Espases, Mallorca, Spain

²⁷School of Medicine, Kocaeli University, Kocaeli, Turkey

Address correspondence to: Alaa El-Hussuna, OpenSourceResearch Collaboration, Aalborg, Denmark (www.OpenSourceResearchCollaboration.net contact@osrc.network)

Background: Management of spontaneous intra-abdominal abscess (IAA) in patients with Crohn's disease (CD) with radiologically guided percutaneous drainage (PD) was debated.

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Methods: This is a secondary analysis from a multicenter, retrospective cohort study of all the patients with CD who underwent PD followed by surgery at 19 international tertiary centers.

Results: Seventeen patients (4.8%) who did not undergo surgery after PD were compared to those who had PD followed by surgical intervention 335/352 (95.2%). Patients who had PD without surgery were those with longer disease duration, more frequently had previous surgery for CD (laparotomies/laparoscopies), enteric fistula, on steroid treatment before and continue to have it after PD. Patients who had PD without subsequent surgical resection had a higher risk of stoma construction at later stages 8/17 (47.1%) versus 90/326 (27.6%) ($P < .01$). Patients with PD with no subsequent surgery had numerically higher rates of abscess recurrence 5/17 (29.4%) compared to those who had PD followed by surgery 45/335 (13.4%) the difference was not statistically significant ($P = .07$).

Conclusions: Even with the low number of patients enrolled in this study who had PD of IAA without subsequent surgery, the findings indicate a markedly worse prognosis in terms of recurrence, length of stay, readmission, and stoma construction. Watchful waiting after PD to treat patients with spontaneous IAA might be indicated in selected patients with poor health status or poor prognostic factors.

Lay Summary

Crohn's disease patients may develop abscesses that need drainage; the necessity of surgery after drainage is unclear. This study demonstrated some patients may benefit from drainage of abscess without surgery but have the potential for a worse prognosis.

Key Words: Crohn's disease, abscess, surgery, complications, stoma

Introduction

It has been suggested that management of spontaneous intra-abdominal abscess (IAA) in patients with Crohn's disease (CD) with radiologically guided percutaneous drainage (PD) may work as a bridge to elective surgery, allowing time for sufficient supportive therapy, including nutritional supplements, bowel rest, and steroid withdrawal before definitive elective surgery.¹ In our recent publication in *BJS Open*, we examined patients with IAA who had PD followed by intestinal resection,² but this study raised the question of whether PD alone is sufficient to treat IAA in some patients because of the potential risk of abscess recurrence and stoma construction. This research letter is an attempt to answer this question.

Methods

This is a secondary analysis from a multicenter, retrospective cohort study of all the patients with CD who underwent PD followed by surgery at 19 international tertiary centers. Data from this cohort have recently been reported.² Coinvestigators have collected data from their centers. Discrepancies in data were resolved by discussion between coinvestigator and the principal investigator (A.E.). The primary outcome variable was abscess recurrence after PD was identified using a diagnostic imaging technique. Secondary outcomes were length of stay (LOS) at hospital and readmissions.

The study period stretched from 2005 to 2020.

The patients who had no surgical resection within 30 days after PD were considered as watchful waiting and were not included in the above study. This was a pragmatic choice since no real cutoff period was included. Here we report on the outcomes of these patients. The term "watchful waiting" was used in this manuscript because patients might need surgical intervention at later stages. Surgeons should be aware of those patients.

Categorical data were analyzed by Pearson chi-square and Fischer's exact tests as appropriate. Continuous data were analyzed with ANOVA for parametric data and with the Mann-Whitney *U*-test for nonparametric data. Data were analyzed in SPSS 19®. Two-sided $P < .05$ was considered statistically significant. Multivariate analysis was not conducted because of small sample size.

Results

Seventeen patients (4.8%) who did not undergo surgery after PD were compared to those who had PD followed by surgical intervention 335/352 (95.2%). **Table 1** shows the demographics characteristics of the 2 groups. More females were in watchful waiting group than in surgery group (70.6% vs 45.4%). Median length of follow-up period for the whole cohort was 5.8 years (interquartile range [IQR] 2.3–10.8 years).

As shown in **Table 1**, patients who had PD without surgery were those with longer disease duration, more frequently had previous surgery for CD (laparotomies/laparoscopies), enteric fistula, on steroid treatment before and continue to have it after PD (**Table 1**).

Patients who had PD without subsequent surgical resection had a higher risk of stoma construction at later stages 8/17 (47.1%) versus 90/326 (27.6%) ($P < .01$). Stoma was chosen instead of anastomosis in these patients who were deemed to have a higher risk for anastomotic leak. Some of those patients who had a watchful waiting after PD may have had surgery at later stages.

Although patients with PD with no subsequent surgery had numerically higher rates of abscess recurrence 5/17 (29.4%) compared to those who had PD followed by surgery 45/335 (13.4%), the difference was not statistically significant ($P = .07$).

Patients who had PD without subsequent surgery tended to have longer LOS (median 11 days IQR 6–26) compared to patients who had PD followed by surgery (median 8 days IQR 6–12). This difference was not significant even after adjusting for patients with postoperative complications ($P = .074$).

Patients who had PD without subsequent surgery had more readmission rates 4/17 (23.5%) than patients with PD followed by surgery 36/335 (10.7%, $P = .114$). The influence of preoperative medications in decision making, whether to continue watchful waiting or conduct surgery, is not clear from the available data.

Discussion

Many questions cannot be answered by this study due to limited data and small sample size. For instance, we have no data about how the recurrent abscesses were treated, how the drains were flushed regularly, and how long did the drainages were left *in situ*. Selection bias cannot be

Table 1. Demographics of patients with Crohn's disease after percutaneous radiologically guided drainage of intra-abdominal abscess. The table shows comparison between patients who had PD followed by surgery and those who had PD with no surgery.

	Watchful waiting 17/352 (4.8%)	PD followed by surgery 335/352 (95.2%)	Univariate <i>P</i> value
Age, median (IQR)	35 (20–52)	33 (24–44)	.579
Gender (female)	12/17 (70.6%)	152/335 (45.4%)	.042
BMI, median (IQR)	22.2 (19.1–23.1)	22.1 (19.6–24.6)	.894
Smoking: Smokers	4/17 (23.5%)	78/335 (23.6%)	.129
Ex-smokers	5/17 (29.4%)	37/335 (11.2%)	
Nonsmokers	8/17 (47.1%)	215/335 (65.2%)	
Duration of disease in years, median (IQR)	11 (2–22)	9 (3.6–15)	.03
Previous laparoscopy/laparotomy	15/17 (88.2%)	118/335 (35.2%)	<.01
Pre-drainage of abscess			
Abscess size in millimeters ^a , median (IQR)	53 (32–75)	50 (30–70)	.532
Pre-drainage antibiotics	13/17 (76.5%)	229/335 (88.1%)	.246
Steroids treatment before PD	1/17 (5.9%)	172/334 (51.5%)	<.01
Immunomodulator treatment before PD	5/17 (29.4%)	90/333 (27%)	.785
Biological treatment before PD	5/17 (29.4%)	82/335 (24.5%)	.579
After drainage of abscess			
After-drainage antibiotics	14/17 (82.4%)	245/279 (93.5%)	.112
Steroids treatment after PD	1/17 (5.9%)	115/319 (36.1%)	.01
Immunomodulator treatment after PD	5/17 (29.4%)	62/330 (18.8%)	.340
Biological treatment after PD	3/17 (17.6%)	63/330 (19.1%)	1.00
Nutrition	3/17 (17.6%)	118/307 (38.4%)	.85
Hemoglobin in mmol/L, median (IQR)	7.2 (7–8)	7.1 (6.3–7.9)	.273
Albumin in g/L, median (IQR)	34 (28–39)	33 (28–39)	.549
Preoperative fistula	0	130/282 (46.1%)	<.01

Abbreviations: BMI, body mass index; IQR, inter quartile range; PD, radiologically guided percutaneous drainage. Bold values to show statistical significance.

The denominator might be different from the total number of patients in each group due to some missing values. Those who had operation 6 months after PD were considered watchful waiting.

^aMaximum diameter of abscess.

ruled out. The increased rate of stoma formation might be explained by different factors so it is an association and causation.

Different centers had different practices regarding the interval between PD and surgery. This adds another limitation to this study.

The aim of this research was to explore the concept of PD followed by watchful waiting. The next step based on this data should be how to identify those few patients who indeed can continue their Crohn's management without surgery.

Although watchful waiting after PD to treat patients with spontaneous IAA might be indicated in selected patients with poor health status or poor prognostic factors, we argue that the preferred choice in this situation should be PD followed by subsequent surgery.

The results of this study would be useful in counseling patients with CD who do not wish surgical intervention.

Conclusion

Even with the low number of patients enrolled in this study who had PD of IAA without subsequent surgery, the findings indicate a markedly worse prognosis in terms of recurrence,

LOS, readmission, and stoma construction. Watchful waiting after PD to treat patients with spontaneous IAA might be indicated in selected patients with poor health status or poor prognostic factors.

Author Contributions

The authors were invited through OpenSourceResearch collaboration (OSRC). OSRC is a nonprofit, international organization to promote the implementation of information technology in clinical research. OSRC has a vast network on social media to facilitate recruitment of participants, design, and conduction of clinical research. More about OSRC (<https://www.osrc.network>). A.E.: Contributed to the conception and design of the study, statistical analysis, writing the manuscript. C.S.: Contributed to statistical analysis, acquisition and interpretation of data. N.N.U.N. and M.L.M.K.: Contributed to statistical analysis. C.A.R.: Statistical analysis. All authors contributed to the acquisition and interpretation of the data, writing the first draft, revising the article critically for important intellectual content, and approving the final version of the article to be published. All authors agree to be accountable for all aspects of the work and A.E. holds overall responsibility for the content and integrity of the paper.

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Conflicts of interest

C.S. received lecture fees from MSD. I.I. received lecture fees from AbbVie. The other authors declare no other conflict of interest.

Data Availability

The data underlying this article were provided by different hospitals under different permissions. Data will be shared

on request to the corresponding author with permission of hospitals that collect this data.

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