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Functional outcomes of bowel resection versus shaving or disc excision of colorectal endometriosis: a systematic review protocol

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ABSTRACT

Introduction Endometriosis is a prevalent gynaecological condition for women of reproductive age worldwide. While endometriosis primarily involves the reproductive system, it can also infiltrate additional viscera such as the gastrointestinal tract. Patients with colorectal endometriosis can have severe symptoms that require surgical intervention. There are limited data available to guide the choice of resection technique based on the functional outcomes of bowel resection versus shaving or disc excision in treating colorectal endometriosis. This protocol aims to outline the methods that will be used in a systematic review of the literature comparing the functional outcomes of bowel resection to shaving and disc excision when surgically treating colorectal endometriosis.

Methods and analysis Papers will be identified through database searches, scanning reference lists of relevant studies and citation searching of key papers. Two independent reviewers will screen studies against eligibility criteria and extract data using standardised forms. Databases including MEDLINE, EMBASE and Cochrane will be searched from the beginning of each database until February 2024. The primary outcome is comparing the functional bowel outcomes between the different methods of surgical treatment. Secondary outcome will be quality of life, based on the Low Anterior Resection Syndrome score and the incidence of postoperative pain. A meta-analysis will be performed if the data are homogenous.

Ethics and dissemination This study does not require ethics approval. The results of the systematic review described within this protocol will be disseminated through presentations at relevant conferences and publication in a peer-reviewed journal. The methods will be used to inform future reviews.

PROSPERO registration number CRD42023461711.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ Given the scarcity of randomised controlled trials (RCTs) in this area, all quantitative studies will be included in this review, increasing the likelihood of capturing relevant evidence.
⇒ By not limiting the studies for inclusion to RCTs, the risk of bias may be increased.
⇒ The process of screening, study selection and data collection will be performed independently by two reviewers to reduce the risk of bias.
⇒ Meta-analyses will be performed if the participants, intervention and study design are homogeneous enough to warrant pooling.

INTRODUCTION

Endometriosis is a prevalent gynaecological condition affecting approximately 6%–10% of women of reproductive age worldwide.[1] It is characterised by the abnormal presence of endometrial tissue outside the uterus which induces a chronic inflammatory state that is most commonly associated with pelvic pain and infertility.[1 2] Endometriosis encompasses three clinical presentations: peritoneal endometriosis, ovarian endometriosis (endometriomas) and deeply infiltrative endometriosis (DIE).[3] DIE has been defined as endometriosis that invades more than 5 mm beneath the peritoneum.[4] While DIE primarily involves the pelvic peritoneum, ovaries and rectovaginal septum, it can also infiltrate extrapelvic sites, such as the bowel.[1] This causes a subset of patients to experience symptoms such as altered bowel habits, dyschezia and tenesmus.[2] In rarer cases, intestinal endometriosis may also cause rectal bleeding, bowel obstruction and bowel perforation.[2 5] The exact prevalence of endometriosis involving the intestine is estimated to occur between 3.8% and 37% of all cases of endometriosis.[6] While endometriosis of the intestine has been observed from the small bowel to the anal canal, approximately 90% of cases involve the sigmoid colon or rectum.[7]

Patients with colorectal endometriosis can have severe symptoms that are refractory to medical therapy. In these cases, surgical intervention is indicated. The surgical management of colorectal endometriosis

presents a clinical challenge due to its proximity to vital anatomical structures and the potential for complications. Depending on the lesion's location, size and depth of infiltration, two main surgical approaches are used. These include segmental bowel resection or the more conservative approaches of shaving or full-thickness disc excision. Segmental colorectal resection involves the removal of the affected segment of the bowel followed by anastomosis. The shaving technique is reserved for superficial lesions which do not invade beyond the serosa and require surgical dissection of the lesion from the affected bowel wall with an aim of not entering the bowel lumen. There are multiple surgical methods for disc excision, all of which ultimately result in a full-thickness excision of the endometriotic lesion along with the surrounding bowel wall, followed by closure either with sutures or staples. The goal of surgical treatment is to completely eradicate symptomatic endometriotic lesions while achieving a high standard of long-term results with regard to symptomatic relief, recurrence rates and functional outcomes.[2 8]

There are limited data available to guide the choice of resection technique based on the functional bowel outcomes of bowel resection, shaving and disc excision in treating colorectal endometriosis. Three published systematic reviews have investigated the clinical outcomes of surgical management of endometriosis with bowel involvement. The first systematic review incorporated literature up until February 2010 and was not outcome or surgical-technique specific.[9] The data were reported in such a way that a comparison of clinical outcomes between different surgical techniques was not possible in this review. The second review focused on the influence of surgery on postoperative fertility only and did not include patients who underwent shaving excision.[10] The third systematic review was specifically focused on segmental bowel resections for endometriosis and their indications, outcomes and complications according to the level of resection and the volume of the nodule.[11] A literature review published in 2017 compared the surgical techniques of shaving, discoid resection and bowel resection in terms of surgical outcomes, complications and recurrence rates, however, did not specifically outline their functional outcomes from a bowel function or pain perspective.[8]

There is a noticeable gap in high-quality evidence which compares the effectiveness of the various surgical approaches in terms of their functional bowel outcomes. This protocol, therefore, aims to outline the methods that will be used in a systematic review of the available literature, which to our knowledge is the first of its kind, comparing the functional bowel outcomes as well as postoperative pain and Low Anterior Resection Syndrome (LARS) scores following bowel resection, shaving and disc excision when treating colorectal endometriosis in females.

METHODS AND ANALYSIS

This systematic review focuses on comparing the functional bowel outcomes of bowel resection, shaving and disc excision when treating colorectal endometriosis. Colorectal endometriosis will be defined as DIE involving the colon or rectum. We have described our methods as per Preferred Reporting Items for Systematic Review and Meta-Analysis for Protocol (PRISMA) recommendations, and this checklist is included as online supplemental additional file 1. The final reporting of this study will be compliant with the main PRISMA statement. This study is registered on PROSPERO, an international register of systematic reviews.

Patients and public involvement

Patients and public were not involved in writing this protocol.

Eligibility criteria

Definitions as per PICO-D have been adapted for the purpose of this review:

1. Participants: females undergoing surgical intervention for colorectal endometriosis. As defined above, colorectal endometriosis is DIE involving the colon or rectum. Surgical interventions include bowel resection, shaving or full-thickness disc excision.
2. Interventions: use of bowel resection. Bowel resection is defined as surgical removal of the affected segment of bowel followed by primary anastomosis.
3. Comparator: use of more conservative approaches such as shaving or full-thickness disc excision. Shaving is defined as surgical separation of the endometriotic lesion from the colon or rectum to reach the uninvolved plane of the bowel wall without disruption of luminal integrity. Full-thickness disc excision is defined as full-thickness excision of the endometriotic lesion along with the surrounding bowel wall, followed by closure either with sutures or staples.
4. Outcomes: Primary outcome is comparing functional bowel outcomes which include faecal incontinence, faecal urgency, frequent bowel movements, clustered stools, dyschezia, constipation and diarrhoea between the different methods of surgical treatment. Secondary outcome will be quality of life based on the LARS score and incidence of postoperative pain.[12]
5. Timing: Databases including MEDLINE, EMBASE and Cochrane will be searched from the beginning of each database until February 2024.
6. Design: Given the lack of randomised controlled trials, all quantitative papers will be considered eligible for this review.

Exclusion criteria: Articles will be excluded if they are not a journal article, not a report based on empirical research (eg, protocol, editorial), reviews, not human research and not in the English language.

Information sources

We will use the PRISMA guideline to search MEDLINE, EMBASE and Cochrane databases from the beginning of

each database to February 2024. An update of the search will be conducted prior to submission to a journal. Further studies will be obtained from scanning reference lists of relevant studies and citation searching of key papers identified for inclusion.

Search strategy

A search strategy was developed with the initial support of a medical research librarian. Keywords included bowel, function, colon, rectum, endometriosis, bowel resection, shaving and disc excision. The full search strategy for all databases is included as online supplemental additional file 2.

Study records

Data management

After searching, the shortlisted articles will be exported to Endnote V.X9 (Thomson Reuters, New York, USA) for storage of study records, abstracts and full-text articles. Data will be stored on a password-protected server-based platform, that is, accessible by both reviewers. At each stage of the data selection process, back up files of the database will be made to retrace any steps as needed in the review process.

Selection process

The process of study selection will be conducted by two researchers. In the initial screening stage, the authors will conduct a title search and identify abstracts, which potentially meet the criteria for study selection. Abstracts for which it is unclear whether to include in the study will be further assessed against the criteria after acquiring full-text articles. This will be done independently to reduce the risk of bias. Discrepancies between two reviews will be resolved by consultation with the senior author. Detailed notations of decisions made to include or exclude studies and the rationale for these decisions will be documented. The flow of studies throughout the selection process will be reported using a PRISMA diagram.

Data collection process

Once the studies for inclusion have been identified, information outlined in a standardised data extraction form (online supplemental additional file 3) will be collected. Data from all included studies will be extracted. The form will be piloted and optimised by the two reviewers using a subset of three randomly selected studies that satisfy the eligibility criteria. The two reviewers will independently extract data from the rest of the included list of articles.

Outcomes

This study will compare the functional outcomes between the different methods of surgical treatment. Primary outcome is comparing the functional bowel outcomes which include faecal incontinence, faecal urgency, frequent bowel movements, clustered stools, dyschezia, constipation and diarrhoea between the different methods of surgical treatment. Secondary outcome will be quality of life based on the LARS score and incidence of postoperative pain.[12]

Data items

The following data will be extracted from the included studies:

1. General study information including study title, citation, authors, year of publication, country of publication and journal.
2. Characteristics of the study including aim, study design and method of recruitment.
3. Participant characteristics including baseline demographics.
4. Outcomes result of primary outcome, risk of bias assessment and overall conclusion.

Risk of bias in individual studies

The risk of bias will be ascertained by two reviewers independently using published, structured and validated risk of bias assessment tools appropriate for the study type.

Assessment of heterogeneity

We will use the I^2 statistic to quantify whether there are any inconsistencies among the included studies. Significant statistic heterogeneity exists if the I^2 value exceeds 50% and subgroup analyses will be conducted to explore possible causes.

Assessment of reporting biases

Funnel plots will be used to detect the potential reporting biases if more than 10 studies are included into the meta-analysis. The Egger's test will be used to determine funnel plot asymmetry.

Data synthesis and analysis

Studies will be included in data synthesis if they fulfil the eligibility criteria. Data will be presented in a descriptive narrative and supplemented with tables and figures where appropriate. Meta-analyses will be undertaken where meaningful; if the participants, intervention and study design are homogeneous enough to warrant pooling. If the I^2 value is between 50% and 75%, a random-effects model will be used. If the I^2 value is higher than 75%, we will provide a descriptive analysis. A fixed-effects model will be used if the I^2 value is lower than 50%.

ETHICS AND DISSEMINATION

This study does not require ethics approval as it is a systematic review. There are no safety concerns. The results of the review described within this protocol will be disseminated through presentations at relevant conferences and publication in a peer-reviewed journal. The methods employed within this review may be used to inform future reviews, particularly those exploring the outcomes of surgery on treating bowel endometriosis.

Contributors WQ and KC drafted the manuscript. WQ and KC conducted the scoping searches and designed the data extraction forms. TL will be involved in data analysis. WQ and CG will be involved in study selection, data extraction, synthesis and analysis. Study was conceived by CG and AM. All authors read and approved the manuscript.

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Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not applicable.

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PRISMA-P 2015 Checklist

This checklist has been adapted for use with protocol submissions to *Systematic Reviews* from Table 3 in Moher D et al: Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. *Systematic Reviews* 2015 **4**:1

Section/topic	#	Checklist item	Information reported		Line number(s)
			Yes	No	
ADMINISTRATIVE INFORMATION					
Title					
Identification	1a	Identify the report as a protocol of a systematic review	☒	☐	2-3
Update	1b	If the protocol is for an update of a previous systematic review, identify as such	☐	☒	
Registration	2	If registered, provide the name of the registry (e.g., PROSPERO) and registration number in the Abstract	☒	☐	45
Authors					
Contact	3a	Provide name, institutional affiliation, and e-mail address of all protocol authors; provide physical mailing address of corresponding author	☒	☐	14-22
Contributions	3b	Describe contributions of protocol authors and identify the guarantor of the review	☒	☐	209-213
Amendments	4	If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important protocol amendments	☐	☒	
Support					
Sources	5a	Indicate sources of financial or other support for the review	☒	☐	204-206
Sponsor	5b	Provide name for the review funder and/or sponsor	☐	☒	
Role of sponsor/funder	5c	Describe roles of funder(s), sponsor(s), and/or institution(s), if any, in developing the protocol	☐	☒	
INTRODUCTION					
Rationale	6	Describe the rationale for the review in the context of what is already known	☒	☐	84-102
Objectives	7	Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO)	☒	☐	97-102

Section/topic	#	Checklist item	Information reported		Line number(s)
			Yes	No	
METHODS					
Eligibility criteria	8	Specify the study characteristics (e.g., PICO, study design, setting, time frame) and report characteristics (e.g., years considered, language, publication status) to be used as criteria for eligibility for the review	☒	☐	113-137
Information sources	9	Describe all intended information sources (e.g., electronic databases, contact with study authors, trial registers, or other grey literature sources) with planned dates of coverage	☒	☐	138-142
Search strategy	10	Present draft of search strategy to be used for at least one electronic database, including planned limits, such that it could be repeated	☒	☐	143-146
STUDY RECORDS					
Data management	11a	Describe the mechanism(s) that will be used to manage records and data throughout the review	☒	☐	148-152
Selection process	11b	State the process that will be used for selecting studies (e.g., two independent reviewers) through each phase of the review (i.e., screening, eligibility, and inclusion in meta-analysis)	☒	☐	153-161
Data collection process	11c	Describe planned method of extracting data from reports (e.g., piloting forms, done independently, in duplicate), any processes for obtaining and confirming data from investigators	☒	☐	162-167
Data items	12	List and define all variables for which data will be sought (e.g., PICO items, funding sources), any pre-planned data assumptions and simplifications	☒	☐	174-180
Outcomes and prioritization	13	List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes, with rationale	☒	☐	168-173
Risk of bias in individual studies	14	Describe anticipated methods for assessing risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis	☒	☐	181-183
DATA					
Synthesis	15a	Describe criteria under which study data will be quantitatively synthesized	☒	☐	191-197
	15b	If data are appropriate for quantitative synthesis, describe planned summary measures, methods of handling data, and methods of combining data from studies, including any planned exploration of consistency (e.g., I^2, Kendall's tau)	☒	☐	184-197
	15c	Describe any proposed additional analyses (e.g., sensitivity or subgroup analyses, meta-regression)	☒	☐	188-197
	15d	If quantitative synthesis is not appropriate, describe the type of summary planned	☐	☒	
Meta-bias(es)	16	Specify any planned assessment of meta-bias(es) (e.g., publication bias across studies, selective reporting within studies)	☒	☐	184-190

Section/topic	#	Checklist item	Information reported		Line number(s)
			Yes	No	
Confidence in cumulative evidence	17	Describe how the strength of the body of evidence will be assessed (e.g., GRADE)	☐	☒	

Online supplementary additional file 2 – full search strategy

Medline:

((function or outcome or "bowel function" or "bowel outcome" or incontinence or urgency or constipation or diarrhoea or dyschezia or tenesmus) and ("bowel resection" or shaving or "disc excision" or surgery) and (colon or rectum or rectal or colorectal) and endometriosis).mp. [mp=title, book title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms, population supplementary concept word, anatomy supplementary concept word]

- *Limit applied: English language*

Embase:

((function or outcome or "bowel function" or "bowel outcome" or incontinence or urgency or constipation or diarrhoea or dyschezia or tenesmus) and ("bowel resection" or shaving or "disc excision" or surgery) and (colon or rectum or rectal or colorectal) and endometriosis).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword heading word, floating subheading word, candidate term word]

- *Limit applied: English language*

Cochrane:

((function or outcome or "bowel function" or "bowel outcome" or incontinence or urgency or constipation or diarrhoea or dyschezia or tenesmus) and ("bowel resection" or shaving or "disc excision" or surgery) and (colon or rectum or rectal or colorectal) and endometriosis)

General	
Title	
Citation	
First author	
Year of publication	
Journal	
Country of publication	
Characteristics of study	
Aim	
Study design	
Method of recruitment	
Participant characteristics	
Number of patients	
- **Bowel resection**	
- **Shaving**	
- **Disc excision**	
Mean age	
Mean Body Mass Index (BMI)	
Smoker (n / %)	
Significant difference in baseline patient factors (Y/N)	
Primary outcome	
Bowel resection	**(n / %)**
Altered bowel habits	
- **Faecal incontinence**	
- **Faecal urgency**	
- **Frequent bowel movements**	
- **Clustered stools**	
- **Dyschezia**	
- **Constipation**	
- **Diarrhoea**	
Shaving	
Altered bowel habits	
- **Faecal incontinence**	
- **Faecal urgency**	
- **Frequent bowel movements**	
- **Clustered stools**	
- **Dyschezia**	
- **Constipation**	
- **Diarrhoea**	
Disc excision	
Altered bowel habits	
- **Faecal incontinence**	
- **Faecal urgency**	
- **Frequent bowel movements**	
- **Clustered stools**	
- **Dyschezia**	
- **Constipation**	
- **Diarrhoea**	
Secondary outcomes	

Low anterior resection syndrome (LARS) score	
Bowel resection	
- **0 – 20 (No LARS)**	
- **21 – 29 (Minor LARS)**	
- **30 – 42 (Major LARS)**	
Shaving	
- **0 – 20 (No LARS)**	
- **21 – 29 (Minor LARS)**	
- **30 – 42 (Major LARS)**	
Disc excision	
- **0 – 20 (No LARS)**	
- **21 – 29 (Minor LARS)**	
- **30 – 42 (Major LARS)**	
Post-operative pain	
Bowel resection	
- **0 (Never)**	
- **1 – 4 (Mild)**	
- **5 – 7 (Moderate)**	
- **8 – 10 (Severe)**	
- **Post-operative pain (not specified)**	
- **Dyspareunia**	
- **Painful defecation**	
Shaving	
- **0 (Never)**	
- **1 – 4 (Mild)**	
- **5 – 7 (Moderate)**	
- **8 – 10 (Severe)**	
- **Post-operative pain (not specified)**	
- **Dyspareunia**	
- **Painful defecation**	
Disc excision	
- **0 (Never)**	
- **1 – 4 (Mild)**	
- **5 – 7 (Moderate)**	
- **8 – 10 (Severe)**	
- **Post-operative pain (not specified)**	
- **Dyspareunia**	
- **Painful defecation**	
Risk of bias	
Selection	**(Y / N)**
- **Allocation sequence random**	
- **Allocation sequence concealed**	
Detection	
- **Blinding**	
Attrition	
- **Incomplete outcome data**	
Measurement	
- **Inappropriate method of measuring the outcome**	
Reporting	

- **Selective reporting**	
Overall risk of bias judgement	
Other	