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Case Report

Extrapelvic Endometriosis of the Rectus Abdominis Muscle After Cesarean Section: A Case Report

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ABSTRACT

Abdominal wall endometriosis is an uncommon form of extra-pelvic endometriosis that typically develops in association with prior uterine surgery, particularly cesarean delivery. Among its variants, isolated involvement of the rectus abdominis muscle is exceedingly rare and may mimic other postoperative abdominal wall pathologies, resulting in delayed diagnosis.

We report the case of a 28-year-old woman presenting with cyclic pain localized to the right lower abdomen, three years after a cesarean section. Magnetic resonance imaging revealed a 2 × 2 × 1.5 cm lesion within the right rectus abdominis muscle, showing signal characteristics suggestive of endometriosis. The lesion was completely excised through a Pfannenstiel incision with approximately 1 cm of healthy tissue margin, and no mesh reconstruction was required. Histopathological examination confirmed the diagnosis of endometriosis, showing endometrial glands and stroma within skeletal muscle fibers. The postoperative course was uneventful, and the patient remained symptom-free during 12 months of follow-up.

This case emphasizes the need to suspect abdominal wall endometriosis in post-cesarean patients presenting with cyclic pain and a palpable abdominal wall nodule near the surgical scar. Early recognition and complete surgical excision with clear margins are essential to ensure accurate diagnosis and prevent recurrence.

1. Introduction

This report aims to present an intramuscular rectus abdominis endometriosis case demonstrating MRI–pathology correlation and successful margin-negative excision without mesh reconstruction, thereby contributing to the limited literature on extrapelvic abdominal wall endometriosis. Endometriosis is characterized by the presence of functional endometrial glands and stroma outside the uterine cavity; when these ectopic implants involve the abdominal wall, including subcutaneous tissue and the rectus abdominis muscle, it is commonly termed abdominal wall endometriosis [1, 2, 3]. Abdominal wall endometriosis most frequently follows gynecologic or obstetric procedures (particularly cesarean section) and is the most common extrapelvic manifestation of the disease [2, 4, 3]. The incidence of abdominal wall endometriosis has been reported to range from 0.03% to 0.4% among women with previous cesarean delivery [5, 3], according to retrospective surgical series, reflecting its rarity but recognized association with prior uterine surgery [6, 2, 4].

Multiple pathogenetic mechanisms have been proposed to explain endometriotic implants of the abdominal wall. The prevailing explanation for abdominal wall endometriosis and rectus abdominis involvement is direct iatrogenic implantation of endometrial tissue into the wound during uterine surgery (implantation or transplantation theory); viable endometrial cells are thought to be mechanically inoculated into subcutaneous tissue or the fascial and muscle planes at the time of laparotomy or hysterotomy, later proliferating under hormonal stimulation [6, 2, 7]. Alternative and complementary hypotheses recognize the possibility of lymphatic or hematogenous dissemination of endometrial cells to distant extrapelvic sites and the role of coelomic metaplasia; such mechanisms have been invoked to explain abdominal wall endometriosis cases occurring in non-surgical sites or those presenting long after the index operation [8, 9] thus, while iatrogenic implantation accounts for the majority of abdominal wall presentations, especially at Pfannenstiel or midline incision sites, lymphovascular spread and metaplastic transformation are included in contemporary etiologic models for rectus abdominis and other extra-pelvic endometriosis [8, 7, 9].

Patients with rectus abdominis or scar endometriosis typically present with a palpable mass at or near a prior surgical scar, often accompanied by cyclic pain that intensifies around menstruation; this combination of an abdominal wall lump and catamenial pain is a characteristic clinical signature that facilitates suspicion for abdominal wall endometriosis [1, 2, 4]. The interval between surgery and symptomatic presentation is variable; cases have been reported occurring months to years after the causative procedure, with a mean latency reported in some series of around 30 months,

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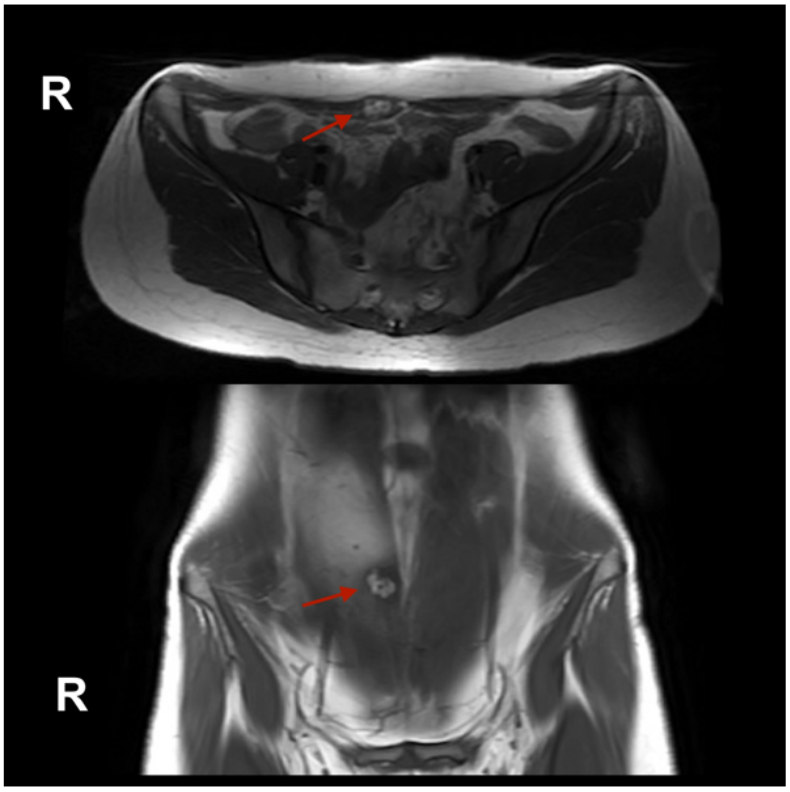

Figure 1: Axial (top) and coronal (bottom) T2-weighted MRI images demonstrating a hyperintense endometriotic focus (red arrows) within the right rectus abdominis muscle, consistent with intramuscular extrapelvic endometriosis.

contributing to diagnostic delay and frequent misdiagnosis as hernia, granuloma, hematoma, keloid, abscess, or neoplasm [1, 8, 9]. Because manifestations overlap with common surgical and dermatologic conditions, many patients are initially referred to general surgery or dermatology services before an accurate diagnosis is established [1, 10].

Imaging plays a significant role in preoperative assessment and surgical planning. High-resolution ultrasound is frequently the first-line modality; abdominal wall endometriosis lesions typically appear as hypoechoic, heterogeneous masses in the subcutaneous tissue or muscle and can be evaluated dynamically with respect to the abdominal wall layers [11, 2]. Magnetic resonance imaging (MRI) offers superior soft-tissue contrast and multiplanar delineation, facilitating discrimination of subcutaneous versus intramuscular involvement—information particularly relevant for lesions within the rectus abdominis—and helps define lesion extent for excision [11].

Definitive management of rectus abdominis abdominal wall endometriosis is primarily surgical, involving wide local excision with clear margins and resection of involved fascia or muscle when necessary. This approach achieves both diagnostic certainty and therapeutic cure while minimizing the risk of recurrence [11, 2]. Medical therapies (hormonal suppression) have been employed as adjuncts or temporizing measures but are generally regarded as less effective than complete surgical excision for isolated abdominal wall lesions; therefore, surgery remains the standard of care for most patients with symptomatic abdominal wall endometriosis [6, 2]. Given the iatrogenic implantation hypothesis, intraoperative preventive measures such as meticulous wound irrigation and isolation of uterine tissue during cesarean delivery have been recommended in the literature to potentially reduce the risk of implantation. However, robust prospective evidence on preventive strategies is limited [7, 3].

Because rectus abdominis endometriosis is uncommon and may masquerade as other abdominal wall pathologies, case reports and series continue to refine awareness of its clinical spectrum, diagnostic pathways, and optimal surgical management; reporting individual cases thus contributes to the cumulative evidence guiding recognition and treatment of this condition [1, 2, 3]. We report a case of intramuscular rectus abdominis abdominal wall endometriosis with MRI–pathology correlation and margin-negative excision without mesh, highlighting diagnostic clues and operative planning.

2. Case Presentation

A 28-year-old woman (BMI 22.8 kg/m²), gravida 1 para 1, with a history of one lower-segment cesarean section three years earlier and no other abdominal or pelvic surgeries, presented with a six-month history of cyclic right lower abdominal pain and a palpable tender nodule above the previous Pfannenstiel incision. Her menstrual cycles were regular (28-day interval, lasting 4–5 days), she was not using hormonal contraception, and had no history of infertility or pelvic endometriosis. She has no prior endometriosis symptoms. Vital signs were within normal limits on presentation. The pain occurred exclusively during menstruation and was described as focal, sharp, and confined to an area approximately 3–4 cm above the cesarean incision, inferior and to the right of the umbilicus.

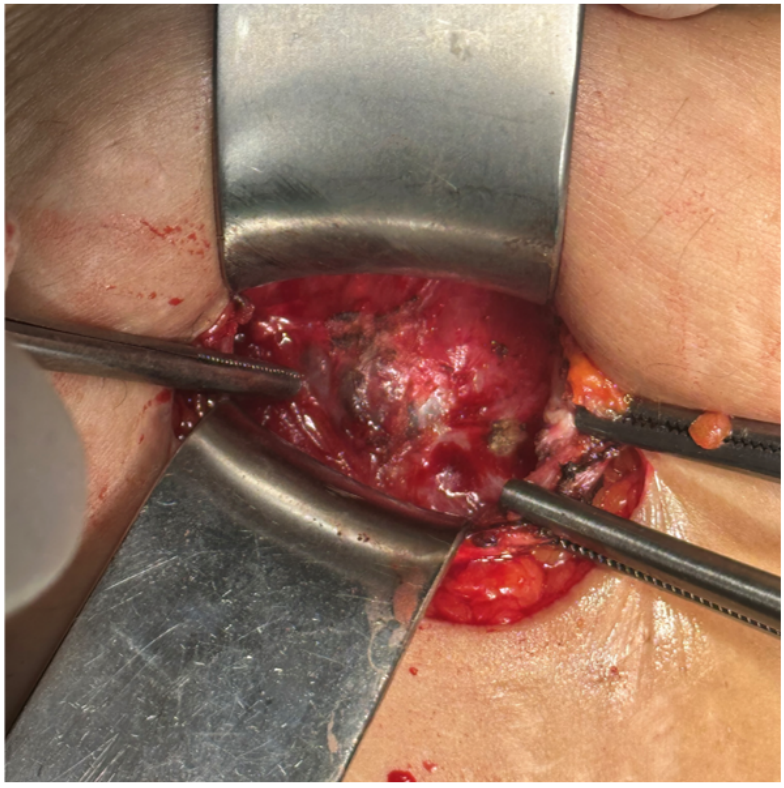

Figure 2: Intraoperative view showing the brownish nodular endometriotic lesion (approximately 2 cm in diameter) located within the right rectus abdominis muscle.

Gynecologic examination revealed normal findings. Pelvic ultrasonography demonstrated a normal uterus and adnexa. On palpation at the site of the patient's reported pain, a firm, approximately 2-cm nodule was detected within the right lower abdominal wall. Given the cyclic nature of the pain, its precise localization, the patient's surgical history, and the presence of a palpable firm nodule, abdominal wall endometriosis was suspected. Magnetic resonance imaging (MRI) was requested to confirm the diagnosis and to evaluate for any concomitant pelvic endometriosis.

Magnetic resonance imaging demonstrated a $2 \times 2 \times 1.5$ cm well-circumscribed lesion within the right rectus abdominis muscle, showing hyperintense signal on T2-weighted sequences and mild peripheral enhancement after contrast administration. The internal heterogeneity was suggestive of hemorrhagic components. Surrounding fascial planes were preserved, and no pelvic or intra-abdominal endometriotic foci were identified. (Figure 1). Based on these findings, surgical excision was planned. Surgical excision was performed through a Pfannenstiel incision under general anesthesia. A well-circumscribed, firm, brownish nodule measuring approximately 2 cm was identified within the right rectus abdominis muscle (Figure 2). The lesion was located beneath but completely separate from the anterior rectus sheath, with no fascial infiltration or adherence. It was excised with approximately 1 cm of grossly healthy muscle margins. Since there was no fascial defect after excision, the fascia was closed primarily, and mesh reinforcement was not required. Estimated blood loss was less than 50 mL, and the total operative time was approximately 30 minutes. The postoperative course was uneventful, and the patient was discharged on the first postoperative day.

Histopathological examination of hematoxylin and eosin–stained sections revealed endometrial stromal and cystic glandular tissue fragments intermixed with skeletal muscle fibers, containing areas of both old and recent hemorrhage. These microscopic features confirmed endometriotic foci within striated muscle tissue (Figure 3a–d). The diagnosis was based on routine hematoxylin and eosin staining, which clearly demonstrated characteristic endometrial glands and stroma within skeletal muscle fibers; therefore, additional immunohistochemical analysis was not deemed necessary. Histopathological examination confirmed the presence of endometrial glands and stroma within skeletal muscle fibers, consistent with endometriosis. The lesion was completely excised with negative surgical margins.

The patient was followed up at 3 and 12 months postoperatively. Clinical examination and ultrasound evaluation at each visit revealed no evidence of recurrence, and the patient remained completely symptom-free during the 12-month follow-up period. Written informed consent was obtained from the patient for publication of this case report and all accompanying images. A summary of the clinical timeline is provided in Table 1.

3. Discussion

Isolated rectus abdominis endometriosis represents a relatively uncommon phenotype within the spectrum of abdominal wall endometriosis and is most frequently described in association with prior uterine surgery, particularly cesarean delivery. This association, along with the overall low frequency of intramuscular presentations, is emphasized in contemporary case reports and reviews [12, 13]. The clinical presentation of abdominal wall endometriosis is protean, but a focal, painful, or tender abdominal wall mass that may be cyclically related to menstruation is typical; nonetheless, AWE may mimic a variety of benign and malignant entities,

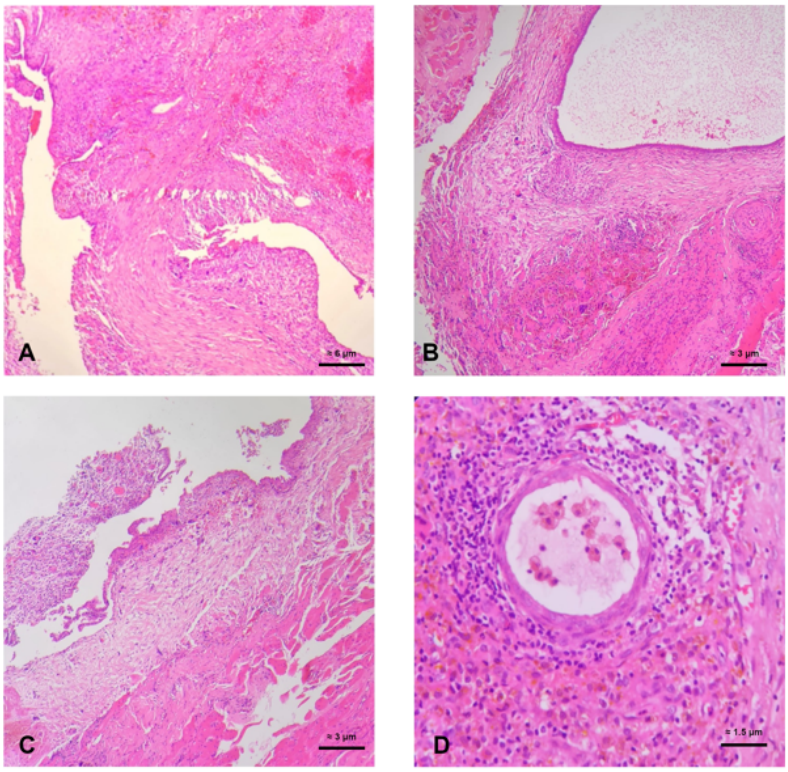

Figure 3: Representative histopathological micrographs showing ectopic endometrial tissue within skeletal muscle at various magnifications. (A) Dense hemorrhagic areas admixed with endometrial glands and stroma (H&E stain, ×100). (B) Cystic endometrial glands and stroma interspersed with hemorrhagic foci within striated muscle tissue (H&E stain, ×200). (C) Endometrial glands and stromal tissue with mild hemorrhage adjacent to skeletal muscle (H&E stain, ×200). (D) Cystic endometrial gland surrounded by stroma rich in hemosiderin-laden macrophages and numerous lymphocytes (H&E stain, ×400).

Table 1: Clinical Timeline of the Patient

Event	Time from Cesarean	Details
Cesarean delivery	0 months	Uncomplicated lower-segment cesarean section
Symptom onset	30 months	Onset of cyclic right lower abdominal pain localized above the cesarean scar
Initial consultation	35 months	A palpable firm nodule (≈ 2 cm) was detected on physical examination
MRI performed	35 months	T2-hyperintense, contrast-enhancing lesion within the right rectus abdominis muscle
Surgical excision	36 months	Complete intramuscular excision; fascia intact; mesh not required
Follow-up (1st)	38 months	Asymptomatic; surgical site well-healed
Latest follow-up	48 months	Patient remained asymptomatic with no evidence of recurrence

MRI, Magnetic Resonance Imaging; LSCS, Lower-Segment Cesarean Section

making preoperative recognition challenging and contributing to delayed or incorrect diagnosis in published series [12, 14]. Our patient's presentation was typical in this regard, with cyclic pain confined to the right lower abdomen near the cesarean scar, and the absence of other pelvic pathology supported an isolated abdominal wall localization.

The differential diagnosis for a painful or palpable abdominal wall mass includes desmoid (fibromatosis) tumor, incisional or abdominal wall hernia, suture or foreign-body granuloma, organized hematoma, lipoma, abscess, and primary or metastatic neoplasm. These conditions are commonly cited across recent reports and reviews as principal mimics of abdominal wall endometriosis and must be considered in the evaluation of any postoperative abdominal wall lesion [12, 14]. Several authors emphasize that the overlap of clinical features and imaging appearances necessitates an integrated assessment that considers surgical history, pain characteristics (including cyclical exacerbation), and targeted imaging to narrow the differential diagnostically and plan definitive management [12, 14]. In our case, the combination of a prior cesarean section, cyclical pain, and a small firm nodule above the incision line was highly suggestive of endometriosis, helping to differentiate it from a hernia or desmoid tumor.

Given the lesion's proximity to the previous Pfannenstiel incision and the absence of other foci, our case strongly supports the iatrogenic implantation theory as the most plausible pathogenic mechanism.

Recent clinical series and reviews focusing on intramuscular or rectus abdominis abdominal wall endometriosis concur that surgical excision remains the standard therapy. However, reporting on margin width, recurrence, and reconstruction techniques is heterogeneous [15, 16, 17, 18]. Case reports and small series have variably recommended explicit margin widths; for instance, Thanasa et al. proposed 5–10 mm clear margins for rectus muscle lesions [18]. In contrast, larger reviews generally advocate wide local excision without a specified numeric cutoff [15, 17]. Available data consistently indicate that complete excision is associated with very low recurrence rates, whereas incomplete removal is linked to a higher risk of recurrence; however, these estimates vary owing to inconsistent follow-up and reporting across studies [15, 16, 17]. Mesh reconstruction is typically reserved for cases involving full-thickness fascial defects or extensive muscle loss, though no consensus threshold for defect width has been established [15, 18].

Ultrasonography is widely used as the first-line imaging modality for suspected abdominal wall endometriosis because it is accessible and allows for real-time assessment of lesion size, location relative to the fascia and muscle, and internal vascularity using Doppler. Sonographic descriptions in recent series commonly report a heterogeneous, predominantly hypoechoic mass either in the subcutaneous tissue or within the muscle, sometimes with ill-defined margins and variable internal blood flow [12, 13]. Magnetic resonance imaging (MRI) offers superior soft-tissue contrast and multiplanar imaging capabilities. It is particularly valuable when intramuscular or deep fascial involvement is suspected, or when preoperative mapping will influence the extent of resection and reconstruction. MRI characteristics repeatedly described include T2-hyperintense foci reflecting subacute or chronic hemorrhage, T2-signal heterogeneity (including "shading" related to blood products), and enhancement after contrast administration. Axial T2-weighted fat-saturated sequences are recommended to highlight hemorrhagic components and distinguish endometriotic foci from other soft-tissue lesions [12, 13]. In practice, combining targeted ultrasound with MRI when indicated increases diagnostic confidence and facilitates operative planning in complex or intramuscular lesions [12, 13]. In the present case, MRI revealed a lesion within the right rectus muscle, demonstrating classic hyperintense signal characteristics, which confirmed the diagnosis and guided precise surgical excision.

Histopathology remains the diagnostic gold standard and is indispensable both to confirm endometriosis and to exclude alternative entities with overlapping presentations (for example, desmoid tumor or sarcoma). Routine histological criteria include the presence of both endometrial glands and stroma, often accompanied by hemosiderin-laden macrophages and evidence of cyclic hemorrhage within the lesion [12, 14]. Given the limitations of imaging and the potential therapeutic implications of alternative diagnoses, excisional biopsy with thorough histopathological assessment is recommended in the majority of cases. Percutaneous core biopsy may be considered selectively when imaging is inconclusive, but definitive excision followed by histological analysis serves both diagnostic and curative purposes in most contemporary series [12, 13]. Histopathologic evaluation in our case confirmed the presence of endometrial glands and stroma within skeletal muscle fibers, establishing the diagnosis of rectus abdominis endometriosis.

Since the evidence base is dominated by case reports and small series, continued systematic reporting, along with larger cohort studies where feasible, is needed to better define the optimum margin width, standardized reconstructive approaches, and long-term recurrence rates [12, 14, 19]. Our case adds to this growing body of evidence by documenting a typical intramuscular presentation that was successfully treated with complete surgical excision and histopathological confirmation, underscoring the importance of early suspicion and multidisciplinary evaluation.

In summary, isolated rectus abdominis endometriosis, while uncommon, should be included in the differential diagnosis of postoperative abdominal wall masses. A combined clinical, imaging, and surgical approach, with histopathological confirmation, yields an accurate diagnosis and effective definitive treatment in the majority of reported cases [12, 14, 13, 19].

This report describes a single case with a relatively short follow-up period and limited details regarding the MRI protocol. Therefore, the generalizability of the findings is restricted. Larger case series with standardized imaging and longer follow-up are required to better define diagnostic and therapeutic strategies for rectus abdominis endometriosis.

4. Conclusions

This case underscores the importance of considering abdominal wall endometriosis in women presenting with cyclic abdominal pain and a palpable mass near a cesarean scar. Complete excision with clear margins provides an effective and durable treatment, as evidenced by the patient's symptom-free status at the 12-month follow-up.

Conflicts of Interest

The authors declare no competing interests that could have influenced the objectivity or outcome of this research.

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None

Informed consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images.

Large Language Model

ChatGPT (OpenAI, GPT-5, 2025) was used solely for language polishing and formatting. No AI tool was used for data generation or interpretation. All AI outputs were verified and approved by the authors.

Authors Contribution

AOA was responsible for conceptualization, data curation, investigation, and writing the original draft. DY handled visualization resources, validation, and writing, including review and editing

Data Availability

All relevant clinical and imaging data are contained within the manuscript. No additional datasets were generated or analyzed for this case report.

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