

## Postpartum pyomyoma due to *Mycoplasma hominis*: A case report

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### ABSTRACT

Pyomyoma is a rare condition that causes fever and abdominal pain associated with pregnancy, especially in the postpartum period. An appropriate diagnosis and early medical intervention are required to prevent serious complications. A 38-year-old primigravida with uterine fibroids had fever from the 11th day after cesarean section. The fever did not resolve despite repeated daily administration of broad-spectrum  $\beta$ -lactam antibiotics for 2 weeks. Although the physical examination did not show any lower abdominal pain, a pelvic magnetic resonance scan revealed degenerative fibroids, and myomectomy was performed. Yellow-greenish odorless pus inside the uterus was detected, and *Mycoplasma hominis* was detected in the pus culture. *Mycoplasma* species are resistant to broad-spectrum penicillin antibiotics and can cause pyomyoma. Pyomyomas may not cause uterine tenderness, and the causative organism may be difficult to identify; therefore, additional imaging studies should be considered.

### 1. Introduction

Pyomyoma has been previously reported as a cause of an unknown fever in the postpartum period [1,2]. The risk factors include uterine cavity manipulation and cesarean section (CS) [3,4]. Degeneration of the myoma and microbial invasion or translocation usually lead to infection, which can have serious consequences, including hysterectomy and even death. In previous reports, the causative organisms have often been *Escherichia coli* and superficial skin bacteria, such as *Streptococcus* and *Staphylococcus* species [5]. However, no case of pyomyoma with *Mycoplasma* spp. as the causative agent has been reported. *Mycoplasma hominis* is a genus of *Mycoplasma* found in the urogenital tract of women, and systemic infections, such as pelvic infections and septicemia, have been reported [6]. As *M. hominis* does not have a cell wall, it is resistant to  $\beta$ -lactams and other antibacterial agents. Because the organism cannot be detected by Gram staining, special media are required [7]. If the presence of an organism is not recognized, identification may be delayed, which could result in severe infections.

This case report concerns a woman with postpartum fever in whom *M. hominis* was detected in pus on the surface of degenerative fibroids at the time of surgery; her fever did not resolve despite daily administration of broad antibiotics.

### 2. Case Presentation

A 38-year-old primigravida with uterine fibroids was admitted to a university hospital because of superimposed preeclampsia at 28 weeks of gestation. She underwent laparoscopic myomectomy at 33 years of age. However, the patient had no history of uterine instrumentation. Transvaginal ultrasonography (US) on the first visit after natural conception revealed a uterine fibroid approximately 8 cm  $\times$  5 cm in size and multiple other fibroids. At the 12th week of gestation, the patient started taking methyldopa due to chronic gestational hypertension.

On admission, the patient had a blood pressure of 220/120 mmHg, pulse rate of 100 bpm, and temperature of 36.5 °C. The urine protein/creatinine ratio was 7.39 g/gCr. A chest X-ray showed bilateral butterfly shadows. A calcium-channel antagonist and magnesium sulfate were started, but her blood pressure became unmanageable, and an emergency CS was performed for maternal indications the day after admission. The CS was via a lower transverse uterine incision, but a myomectomy could not be performed due to increased bleeding risk. Postoperatively, intensive care with antihypertensive drugs and diuretics was provided to control blood pressure and fluid balance.

On the ninth postoperative day, the patient's body temperature rose to 38.2 °C with shivering. Although her temperature rose to nearly 38 °C

Abbreviations: CS, cesarean section; US, ultrasonography; CT, computer tomography; MRI, magnetic resonance imaging; DWI, diffusion-weighted image.

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each day, the fever did not last for 2 h, and there were no apparent signs of infection; therefore, she was discharged on the 14th postoperative day. The fever and symptoms resolved after urination. It was considered it to be uncomplicated cystitis and it was observed closely without administration of antibiotics.

Sixteen days after the CS, the patient visited the emergency room because of high fever and shivering. She demonstrated tachycardia at 120 beats per minute, blood pressure of 120/80 mmHg, and temperature of 40.2 °C. Her white blood cell count was  $\times 10^6/\text{ml}$ , neutrophils were 90%, and C-reactive protein (CRP) was 31 mg/dL. Internal examination did not reveal any uterine tenderness or malodor of discharge. Computer tomography (CT) showed a degenerated 8-cm-sized fibroid but no apparent abscess formation. Administration of piperacillin–tazobactam was begun, at 4.5 g every 8 h. The vaginal discharge culture showed *Gardnerella vaginosis* at admission, but no organisms were found in the blood and urine cultures.

Five days after the initiation of antibiotics, the fever remained at around 39 °C; therefore, blood, urine, and vaginal cultures were retaken, but all were negative (Fig. 1). Lumbar spinal magnetic resonance imaging (MRI) and echocardiography were performed to rule out prolonged fever due to spondylitis or endocarditis. A pelvic MRI scan was performed to determine the degenerative condition of the fibroids because the US and CT findings could not specifically rule out infection of the degenerated fibroids. The MRI scan showed a 12-cm fibroid with edematous changes and increased diffusion-weighted image (DWI) signal in the marginal zone of the degenerative fibroid (Fig. 2.). After ten days of broad-spectrum antimicrobial therapy failed to resolve the fever, and CT and MRI could not rule out infection of the degenerative fibroid, the decision was made to perform a myomectomy.

Surgery was performed 31 days after CS and 22 days after fever onset. During laparotomy, no abscess was observed, and clear abdominal fluid was obtained from the pelvic cavity. The uterine surface was smooth. An incision was made at the bottom of the uterine fundus, and a yellow-greenish odorless fluid was obtained on the surface of the fibroids. A 1000-g dark red degenerated myoma was removed (Fig. 3).

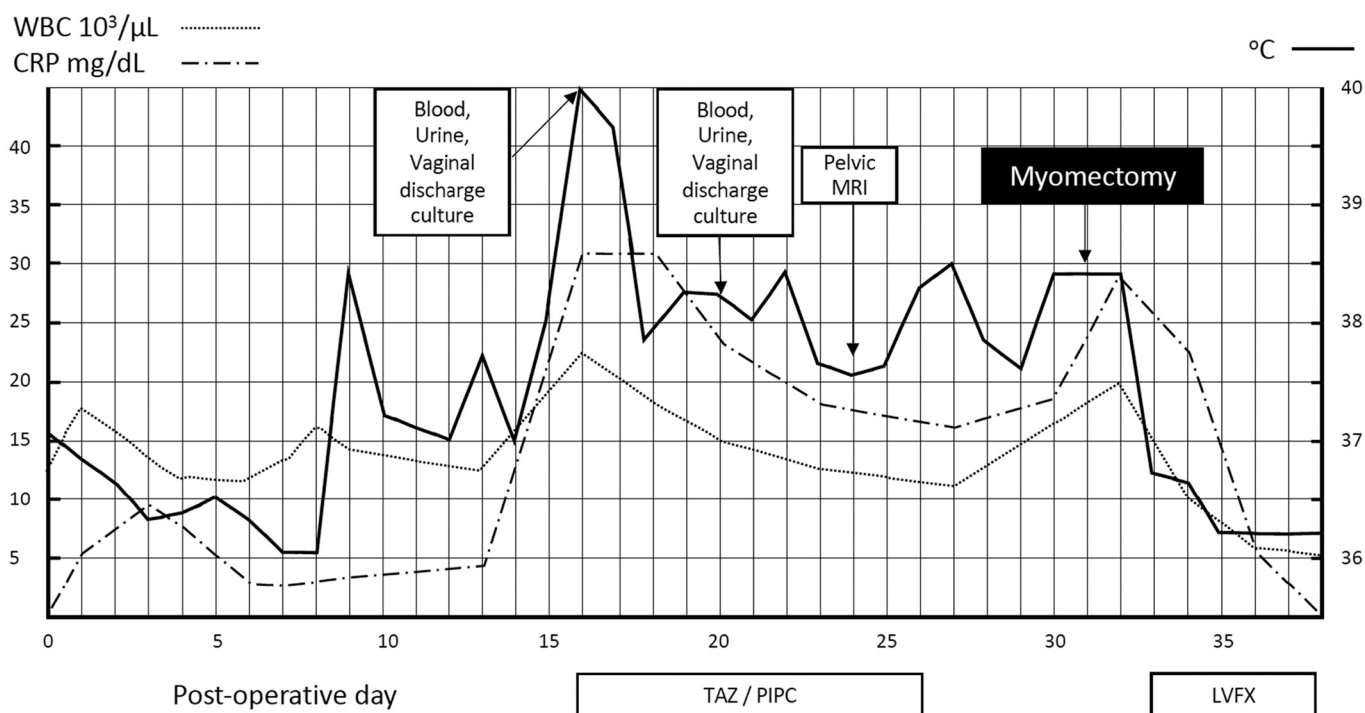
Histopathology confirmed a degenerated leiomyoma, which had neutrophilic invasion and necrotic lesions. *Metamycoplasm hominis* was detected by mass spectrometry. However, *M. hominis* was not detected in intraoperative ascites fluid, normal myometrium tissue, or degenerated myoma tissue.

The patient had an excellent clinical course after surgery, without any fever. She was discharged on the sixth postoperative day. Oral levofloxacin was continued for one week after discharge. The patient remained stable and symptom-free. Blood samples one month post-partum showed no signs of infection, and ultrasound examination showed no abscess or hematoma formation.

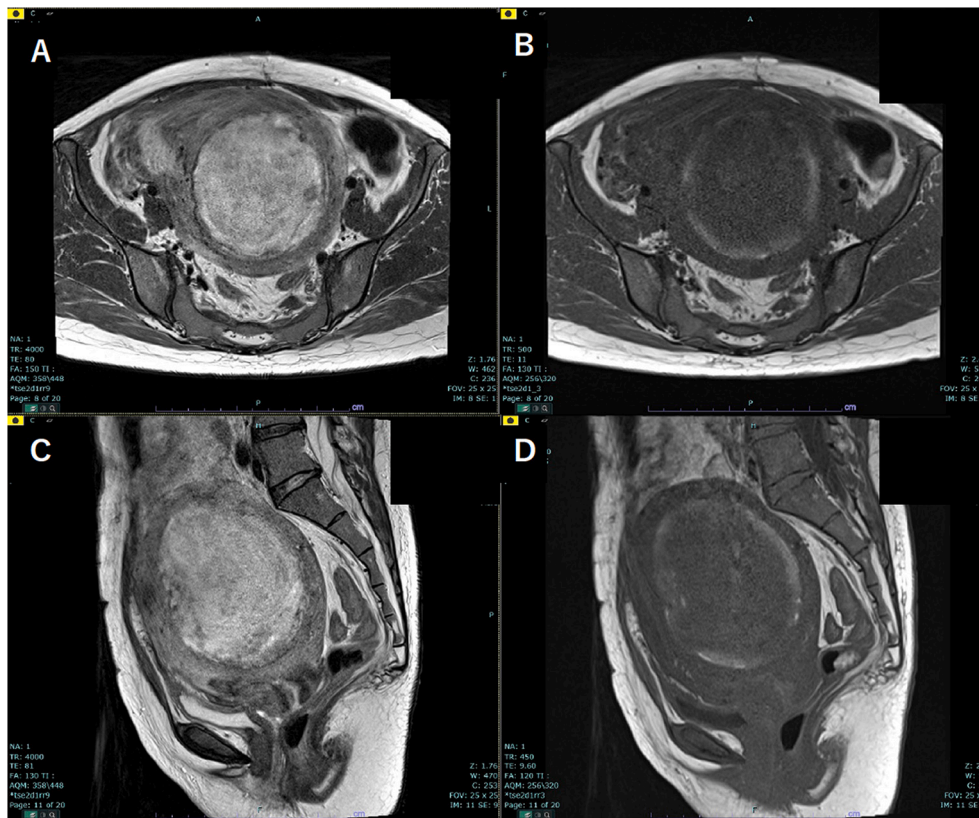
### 3. Discussion

Pyomyoma is a rare condition in which a myoma is superimposed onto an infection. In a review of 75 cases of pyomyoma, 48% were associated with pregnancy, and intrauterine manipulations, especially curettage and CS, often contributed to the infection [5]. Most pyomyoma infections are caused by vaginal ascending infection or direct contact with the uterus during surgical procedures. Enteric bacteria, *Staphylococcus*, and streptococcal species are the causative organisms in most cases. This case is the first in which *M. hominis* was isolated from degenerated fibroids as the causative agent.

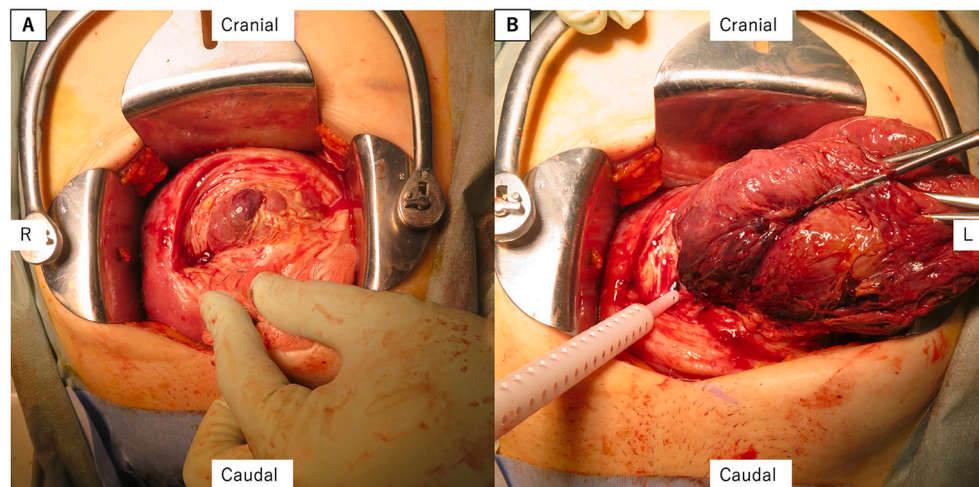
*Mycoplasma* species lack a cell wall and are resistant to  $\beta$ -lactam antibiotics [8]. Furthermore, they cannot be confirmed by Gram staining and require a special culture medium. In this case, the patient's fever persisted for 3 weeks despite broad-spectrum  $\beta$ -lactam antibiotics, given on the assumption that the patient had an intrauterine or wound infection. Furthermore, on different occasions, no organism could be identified in the two blood and urine cultures. Identifying the organism without suspecting *Mycoplasma* species and performing tests, such as specimen culture, is complex. If the patient does not improve after continued  $\beta$ -lactam antibiotic treatment, a change in antimicrobials or invasive procedures should be considered early, considering *Mycoplasma* infection.



**Fig. 1.** Clinical course and change in body temperature, white blood cell (WBC) levels, and C-reactive protein (CRP) levels. 4.5 g of tazobactam/piperacillin (1:4; TAZ/PIPC) was administered intravenously three times daily. Blood urine, urine, and vaginal discharge culture were taken on the 16th and 20th postoperative days. The myomectomy resolved the patient's fever when WBC and CRP diminished to normal ranges.



**Fig. 2.** Magnetic resonance images: axial T2-weighted (A), T1-weighted (B), sagittal T2-weighted (C), and sagittal T1-weighted (D). Degenerated fibroid with ring-shaped high signal around fibroid in the T1-weighted image.



**Fig. 3.** Intraoperative photographs. A) Yellowish pus bulging into the incision line. B) A degenerative myoma is enucleated with traction through the uterine incision.

Postpartum endometritis caused by mycoplasmas has been reported [9], especially after CS, with an odds ratio of 4.7. In some cases, they cause subcutaneous wound infections after CS and are responsible for various postpartum fever or infections. Macrolides, such as erythromycin, clindamycin, and fluoroquinolone antibiotics, are effective in treating postpartum fever due to *Mycoplasma* infection [8]. However, in recent years, strains resistant to these antibiotics have emerged [10], and caution is required. Pyomyoma is often difficult to treat conservatively with antibiotics, and if intrauterine infection with *Mycoplasma* is known preoperatively, invasive myomectomy is an appropriate

treatment.

Pyomyoma often presents with symptoms such as fever, abdominal pain, and abdominal mass and is a potentially life-threatening condition if peritonitis or sepsis occurs [5]. Uterine tenderness and acute abdomen are important clinical symptoms of intrauterine infections and degenerative fibroids [11]. However, in the present case, uterine tenderness was not present on examination at the time of fever, and dull back pain was the only complaint. No other findings suggestive of endometritis from the nature of the discharge made the diagnosis difficult. Therefore, pyomyoma should be included in the differential diagnosis of fever of



unknown origin during the postpartum period, and imaging studies should be performed. US and CT are the first-line imaging approaches for abdominal lesions. However, in the case of pyomyoma, US and CT findings are not specific unless the infection is so advanced that anaerobic gas is found in the mass [5,12]. MRI can detect changes in soft tissue. Degenerated fibroids, as in the present case, are characterized by a high signal on T1-weighted images with high marginal signals and poor contrast effect [13]. A recent case report shows that a marked restriction on DWI sequence has provided a suspicion of abscess formation [14]. In the present case, CT revealed a degenerative change in the fibroid. MRI provided a more detailed assessment of the degenerative fibroid, which guided surgical procedures without completely ruling out the possibility of infection.

#### 4. Conclusion

Pyomyoma due to a degenerated fibroid should always be considered in postpartum fever, especially during CS. Moreover, pyomyoma may not cause uterine tenderness, and the causative organism may be difficult to identify; therefore, bacterial culture targeting the *Mycoplasma* genus should be considered when fever persists despite  $\beta$ -lactam antibiotic administration.

#### Contributors

Tomohiro Mitoma was responsible for the conceptualization of the case report, was the main author, conducted the literature review, and drafted the manuscript, and was involved in the patient's treatment, from hospitalization to discharge.

Hikaru Oba made substantial contributions to the clinical management and reviewed and revised the manuscript.

Sakurako Mishima made substantial contributions to the clinical management and reviewed and revised the manuscript.

Akiko Ohira made substantial contributions to the clinical management and reviewed and revised the manuscript.

Satoe Kirino made substantial contributions to the clinical management and reviewed and revised the manuscript.

Kazumasa Tani made substantial contributions to the clinical management and reviewed and revised the manuscript.

Jota Maki was responsible for the conceptualization of the case report, was involved in the case, and reviewed and revised the manuscript.

Eriko Eto was responsible for the conceptualization of the case report, was involved in the case, and reviewed and revised the manuscript.

Kei Hayata was responsible for the conceptualization of the case report, was involved in the case, and reviewed and revised the manuscript.

Hisashi Masuyama was responsible for the conceptualization of the case report, was involved in the case, and reviewed and revised the manuscript.

All authors approved the final version of the paper and take full responsibility for the work.

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#### Patient consent

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#### Conflict of interest statement

The authors declare that they have no conflict of interest regarding the publication of this case report.

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