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Ruptured ectopic pregnancy management in the COVID-19 pandemic era: a case report

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ABSTRACT

Introduction: COVID-19 protocol and the unavailability of proper instruments in the isolation room had complicated the usual protocol to diagnose and manage the medical and surgical conditions. This article is about the first ruptured ectopic pregnancy cases encountered during the COVID-19 pandemic in Sanglah General Hospital. Considering the unique circumstances and the difficulty during establishing the diagnosis and conducting the management, we ought to present our experience through this article.

Case Description: This case report reviews a 24-years-old female, an asymptomatic COVID-19 case, who was diagnosed with ruptured ectopic pregnancy during appendectomy surgery in Sanglah General Hospital, Denpasar, Bali-Indonesia. The patient complained about mild lower right abdominal pain, with a clinical picture that supports acute appendicitis. However, the history taking revealed a history of post-curettage 15 days prior to admission due to vaginal bleeding suspected for incomplete abortion. Except for a positive pregnancy test, the clinical picture did not support a

pregnancy nor a ruptured ectopic pregnancy. We still consider an ectopic pregnancy as no histopathological examination result was available to supports the previous vaginal bleeding was an intrauterine pregnancy. Further to complicate the problem, the patient was reactive for the COVID-19 screening test, thus requiring a COVID-19 protocol. As an ultrasound device was unavailable at the time in the isolation room, we could not assess for extrauterine pregnancy. Only during the surgical procedure for appendectomy, our surgical college notified us of the accompanying presence of sign of ruptured right ampullary pregnancy.

Conclusion: The COVID-19 isolation protocol and the unavailability of essential equipment and diagnostic tools in the isolation room could hinder the usual protocol used to diagnose and manage various medical and surgical problems. We hope this article could illustrate how COVID-19 had complicated unusual cases, thus reflect how important clinical judgment and infrastructure in our health care system.

Keywords: case report, ectopic pregnancy, ruptured ectopic pregnancy, COVID-19

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INTRODUCTION

Ectopic pregnancy or extrauterine pregnancy is a condition in which the blastocyst implants anywhere other than at the endometrial lining of the uterine cavity.¹ When the implantation is aborted and ruptured, the condition is described as ruptured ectopic pregnancy. The typical locations for ectopic pregnancies are the fallopian tube (95-96%) and the ampulla (70%). Rarely, it occurs in the ovary (1-3%), abdominal cavity (1%), the cervical canal (<1%), and cesarean section scar (1-3%).^{1,2}

In the United States, ectopic pregnancy accounts for approximately 2% of all reported pregnancies.^{2,3} Furthermore, the prevalence of women with ectopic pregnancies that come to the emergency department with first-trimester vaginal bleeding, abdominal pain, or both were as high as 18%.² In 2011-2013, ruptured ectopic pregnancy accounted for 2.7% of all pregnancy-related deaths and was the leading cause of hemorrhage-related mortality.²

As diagnosis and treatment protocols advance over the years, the mortality due to ectopic pregnancy in the United States ceases significantly. The ectopic pregnancy mortality ratio has fallen 56% between 1980 to 1984 and 2003 to 2007.¹

The definitive diagnosis of ectopic pregnancy and ruptured ectopic pregnancy is established by direct observation during the surgical procedure and histopathological examination.⁴ As the result of the advances in ultrasonography and serial serum b-hCG assay combined with an evidence-based algorithm, diagnosis of ectopic pregnancy cases can be established before patients undergo surgery. Confirmation by diagnostic laparoscopy remains the gold standard for ectopic pregnancy diagnosis.¹

Surgical treatment is the primary treatment for ectopic pregnancy. In Indonesia, the standard procedures include laparotomy or laparoscopy, salpingostomy, or salpingectomy. Considering the various complications that might arise from

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surgery and anesthesia as well as the prognosis for subsequent female fertility, medical treatment options can be considered in certain conditions.²

During this pandemic era, we could not exclude the possibility of COVID-19 infection coexistent with classic complaints of a ruptured ectopic pregnancy such as abdominal pain, vaginal bleeding, and a positive pregnancy test. However, there are new problems that previously did not exist. The main limitation is the availability of tools and facilities, especially isolation rooms, for doing examinations. Furthermore, a particular history that creates an examination bias can make an ectopic pregnancy undiagnosed until the surgery is performed.

CASE

A secondary-level hospital referred a 24-years-old, 155-cm, 52-kilograms Balinese female diagnosed with suspected acute appendicitis with post uterine curettage (day-15) history. The patient was suspected of COVID-19 infection due to the SARS Cov-2 IgG and IgM Rapid Tests that were reactive. Therefore the patient was required to be treated in an isolation room. The patient had no COVID-19 symptoms. We directly transported the patient to a COVID-19 isolation room. All of the examinations used level 3 personal protective equipment (PPE). From the Pulmonology department's isolation room analysis, the patient was consulted to the Surgery Department because she was diagnosed with suspected appendicitis with signs and symptoms of appendicitis, and they consulted to Ob-gyn department because of a positive pregnancy test. From the guidelines for the prevention and control of Coronavirus Disease (COVID-19) from the Indonesian Ministry of Health, there are no criteria of diagnosis for a positive SARS CoV-2 IgG and IgM Rapid Test. This patient applied for a Rapid Test because the plan of treatment regarding this patient was surgery. At the referrer hospital, RT-PCR facilities were not available, so the patient was referred mainly for RT-PCR examination based on the Rapid Test's positive results. According to the Surgery, Ob-gyn, and Anesthesia department policies, surgical patients with a reactive COVID-19 Rapid Test should be placed in an isolation room and tested for RT-PCR examination. The result of the RT-PCR analysis for this patient was positive. Therefore, we included this patient in the criteria for Confirmed Cases.⁵

Aside from COVID-19 related issues, the patient's primary complaint was lower right abdominal pain for at least an hour before admitting to a secondary hospital. The history of

vaginal bleeding was denied. Our examination in the Sanglah Hospital showed that the patient's general condition was good. She expressed mild abdominal pain, which perhaps had been improved because she had already received analgesic therapy from the referring hospital (intravenous Ketorolac 30 mg). Since the previous seven weeks after five days of late menstruation, the patient had known positive self-administered pregnancy. Moreover, it also reinforced with a positive pregnancy test result at hospital admission (at the referring hospital). From the obstetric history, the first day of the patient's last menstrual period was 11 weeks ago. This was her first pregnancy. Additionally, she was diagnosed with incomplete abortion with a history of uterine curettage 15 days ago at another hospital near to the patient's house, but without histopathology examination. Therefore, there was no data to confirm whether the clinical picture suspected as abortion was intrauterine pregnancy or a decidual cast as a result of conception. In her medical history, there was neither history of an IUD nor endometriosis, but the patient had a history of vaginal discharge.

Her general condition was good, and her vital signs were stable, blood pressure 110/80, pulse 80 beats per minute (bpm), axillary temperature 36.5°C. From the physical examination, the abdomen was symmetric, and the uterine fundus was unpalpable. McBurney's sign (lower right abdominal pain), Blumberg's sign (pain in the lower abdomen after abrupt withdrawal of the hand from the lower abdominal quadrant), and Rovsing's sign (pain on the right lower quadrant when the left lower quadrant was palpated) were all positive. Speculum examination showed no bluish coloration of the cervix, vagina, and labia (Chadwick's sign was negative). The pelvic examination revealed no slinger pain, no softening uterine consistency (Hegar's sign was negative), no softening of the cervix (Goodell's sign was negative), and no bulging pouch of Douglas. Since there are no ultrasound instruments available in the isolation room, the early pregnancy's signs (Chadwick's, Hegar's, Goodell's signs) were thoroughly conducted. Due to the history of uterine curettage 15 days before, we were still considered suspicion of an ectopic pregnancy. Laboratory results were white blood cell count (WBC) of 16,000/mL, hemoglobin (HGB) of 12.4 g/dL, hematocrit (HCT) of 34.5%, and platelet (PLT) of 288,000/mL, red blood cell count of 4.28×10^6 /mL. The lymphocyte percentage (LYM%) was 7.9%, mid-range cell percentage (MID%) was 3.3%, granulocyte percentage (GRA%) was 88.8%, absolute lymphocyte count (LYM#) was 1.2×10^9 /L, absolute mid-range cell (MID#) was 0.6×10^9 /L,

absolute granulocyte (GRA#) was $14.2 \times 10^3/\text{mL}$. The repeated pregnancy test came out positive, confirming the previous test.

After carefully weighted all the clinical and laboratory data, the patient was diagnosed with abdominal pain et causa suspected acute appendicitis with differential diagnosis of suspected ruptured ectopic pregnancy, suspected COVID-19 infection, and history of post curettage day 15 et causa incomplete abortion. The surgery department recommends surgical treatment. During the operation, the surgery department notified the Ob-gyn department about a finding of 400 ml hemoperitoneum, suppurative appendicitis, and bleeding from the lower edge of the appendix, thus raising suspicion of ruptured ectopic pregnancy. The Ob-gyn department went to the operating room and conducted the examination. The finding indicates a ruptured right ampullary pregnancy. The surgery then continued with the right salpingectomy procedure. The intraoperative photos were shown in [Figure 1](#). The images were slightly blurred due to plastics wrapping as an unavoidable limitation of COVID-19 protocol.

The histopathological examination reports an ectopic tubal pregnancy, and histomorphology from the appendix was suitable for early acute appendicitis, thus confirmed the previous clinical finding. This patient's postoperative diagnosis was post-right salpingectomy due to ruptured right ampullary ectopic pregnancy, post-appendectomy due to suppurative appendicitis and asymptomatic COVID-19 infection. Postoperatively, the patient

was in good condition, isolated for ten days in an isolation room, and discharged at postoperative day 10 for self-isolation at her home for 14 days.

DISCUSSION

In general, ectopic pregnancies' signs and symptoms are vaginal bleeding during the first trimester and abdominal pain. Although vaginal bleeding and abdominal pains are complications of intrauterine pregnancy and spontaneous abortion, examiners should also consider ectopic pregnancy. Carefully explored history of the first day of the last menstrual period, the onset of symptoms, intensity, and the presence or absence of risk factors for ectopic pregnancy can help establish the diagnosis.⁷ From history taking, this patient mentioned that she had a history of vaginal discharge, a history of odorous, yellowish-white discharge itchy sensation from the birth canal. The vaginal discharge is a subtle finding that reflects one of the risk factors for ectopic pregnancy, as internal genital infection also plays an essential role in tubal damage that leads to ectopic pregnancy. This condition is related to the disruption of ovum transport due to disruption of tubal cilia movement.⁸

Theoretically, we identified an ectopic pregnancy by combining clinical findings, sonographic examination, and serum b-hCG. The clinical findings are a history of amenorrhea, vaginal bleeding, and lower abdominal pain. When the clinical picture worsens, further accompanied by Douglas's pouch bulging, it is highly likely the patients are having a ruptured ectopic pregnancy. Therefore, immediate surgical treatment was deemed necessary.

Theoretically, ultrasound examination is hugely beneficial in confirming pregnancy location at a gestational age starting from 5 weeks old.⁷ ISUOG Consensus Statement on rationalization of early-pregnancy care and provision of ultrasonography in context of SARS-CoV-2 describe that: 1) if a pregnant woman has pelvic pain and has not had a previous pelvic scan documenting a common site pregnancy in the uterus, the patient should attend for an ultrasound scan within 24 h, 2) if a patient in early pregnancy has heavy vaginal bleeding (bleeding score of 3 or higher) for more than 24 h and develops symptoms of blood loss, they should attend an ultrasound scan within 24 h, 3) if a patient with risk factors for ectopic pregnancy develops symptoms (i.e., pelvic pain and vaginal bleeding), they should attend for an ultrasound scan within 24 h. Risk factors for ectopic pregnancy include: a) Previous ectopic pregnancy; b) Previous fallopian-tube surgery; c) Previous pelvic or abdominal surgery; d) Sexually transmitted infection; e) Pelvic

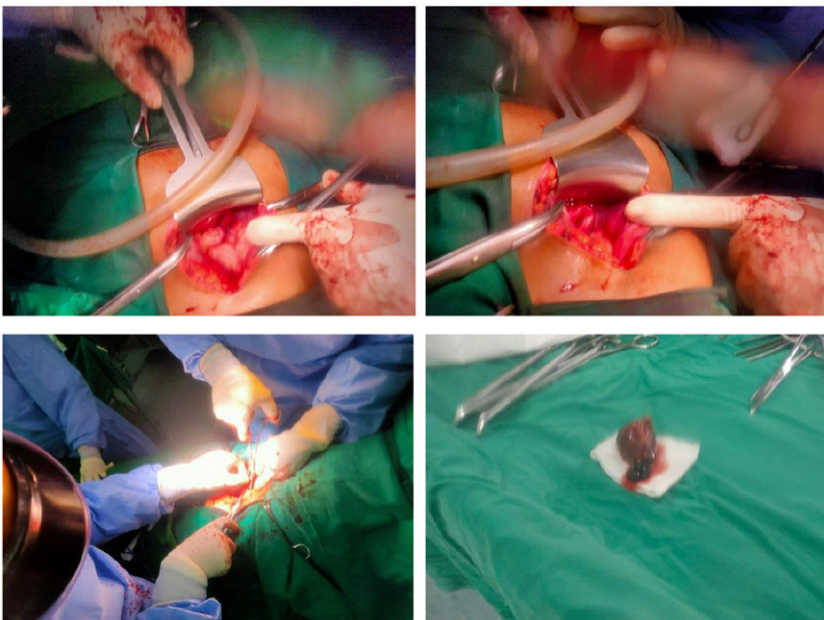


Figure 1. The surgical procedure.

inflammatory disease; f) Presence of an intrauterine contraceptive device or intrauterine system; g) Use of assisted reproductive technology. The ISUOG Consensus also describes the patient can avoid early-pregnancy scans for the duration of the COVID-19 pandemic: 1) asymptomatic women in early pregnancy who request an ultrasound scan for reassurance, irrespective of risk factors, 2) asymptomatic women in early pregnancy with a history of previous miscarriage(s), 3) patients in early pregnancy who have minimal symptoms, such as slight vaginal bleeding (bleeding score of 1) with or without mild pelvic discomfort (quantified using the visual analog scale for pelvic pain) that resolves spontaneously.⁹

This patient had undergone uterine curettage due to an incomplete abortion 15 days before this admission. During this pregnancy, she had two transvaginal ultrasounds by 2 Ob-gyn doctors, and the doctor who performed curettage mentioned that pregnancy tissues had been removed (but without histopathology examination). Still, from that information, we assumed it was an aborted intrauterine pregnancy. She had no vaginal bleeding, no severe pelvic pain (VAS 2), and no risk factors for ectopic pregnancy. Therefore, she was eligible for the postponement of early pregnancy ultrasound in this COVID-19 pandemic setting. Early pregnancy with minimal symptoms, such as slight vaginal bleeding (bleeding score 1) with or without mild pelvic pain (assessed by visual analog scale/VAS), which resolves spontaneously, according to the ISUOG consensus, is not eligible for immediate early pregnancy ultrasound. Due to the lack of an ultrasound device in the isolation room, we could not perform an ultrasound examination. We could either transported the patient to the obstetrics emergency room or moved the ultrasound instrument to the isolation room. However, the distance from the ultrasound instrument's locations and the isolation room is about 700 meters, another obstacle that complicates the problem.

During this COVID-19 pandemic, we also must carry out a specific evaluation of COVID-19 exposure or infection. The most common symptoms of COVID-19 are fever, fatigue, dry cough, anorexia, myalgia, dyspnea, and sputum production. Less common symptoms are anosmia, dysgeusia, nausea, and diarrhea.¹⁰ This patient did not develop any of these symptoms, but the screening test and PCR test has confirmed the presence of COVID-19 infection. Therefore, diagnosed with an asymptomatic confirmed case.

We diagnosed the patient with abdominal pain et causa suspected acute appendicitis with differential diagnosis of suspected ruptured ectopic pregnancy, with suspected COVID-19 and history

of post curettage day 15 et causa incomplete abortion. The diagnosis of suspected ruptured ectopic pregnancy could not be established because acute abdomen symptoms more likely lead to acute appendicitis, supported by the Surgery department's consultation reply that the Alvarado score was 7. It is also reinforced by the finding of pain in the McBurney area, Rovsing's sign, Obturator sign, Blumberg sign, and Dunphy sign. Besides that, from the Ob-gyn examination, there was no Chadwick's sign and slinger pain. A positive pregnancy test can still occur until the 19th-day post spontaneous abortion,¹¹ even with a history of an incomplete abortion treated with uterine curettage 15 days before and the absence of a histopathology examination result. Moreover, with the inability to carry out an ultrasound examination, there were no abnormalities from the Ob-gyn examination. However, we must still suspect ruptured ectopic pregnancy because of no evidence of histopathology that the pregnancy was intrauterine. Moreover, the patient's pregnancy test always positive, accompanied by abdominal pain.⁷ So the consultation reply from Ob-gyn was: if Surgery department planned surgery and an abnormality from the Ob-gyn field could consult this patient again.

During the operation, the patient was consulted with the Ob-gyn department by the Surgery department because they found 400 ml of hemoperitoneum, suppurative appendicitis, and bleeding from the lower edge of the appendix, with suspected ruptured ectopic pregnancy. The Ob-gyn department could establish the diagnosis of ruptured right ampullary pregnancy, and the right salpingectomy was performed. Following the theory, i.e., the definitive diagnosis of ruptured ectopic pregnancy is based on findings during the surgical procedure.⁴ Histopathology examination result showed tubal ectopic pregnancy and histomorphology from the appendix suitable for early acute appendicitis. Postoperative diagnosis of this patient was post-right salpingectomy due to ruptured right ampullary ectopic pregnancy with post appendectomy due to suppurative appendicitis and asymptomatic COVID-19 infection.

CONCLUSION

Ectopic pregnancy is a condition in which a gestational sac is located outside the uterine cavity. If the rupture occurs, it can be life-threatening due to bleeding and leads to death if not treated immediately. Thus, a surgical procedure is necessary if there are signs of ruptured ectopic pregnancy. The COVID-19 isolation protocol could hinder the usual protocol used to diagnose and manage

various medical and surgical problems, including this case. This article illustrates a case of ruptured ectopic pregnancy, with a history of previous uterine curettage 15 days before admission and without histopathology examination of the abortion tissue. Histopathology examination for uterine curettage would play a vital role, specifically, if there were no uterine pregnancy records. As the histopathology result was not available, specifically in the case of COVID-19 that was treated in isolation rooms, those circumstances made the diagnosis more difficult. Unavailability of essential equipment and diagnostic tools in the isolation room and protocols, e.g., wear personal protective equipment level 3 for ultrasound examination in the isolation room, should be resolved. For patients with COVID-19 in stable conditions without emergencies (i.e., no rupture), medical treatment with methotrexate is preferable, and ultrasound examination can be delayed to lower the risk of spreading infections from COVID-19 patients.

PATIENT CONSENT

The patient had agreed and signed informed consent regarding publishing her clinical case in an academic journal without exposing her identity.

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CONFLICT OF INTEREST

The authors do not have any conflict of interest to disclose.

AUTHOR CONTRIBUTION

Both authors contributed equally to the study.

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