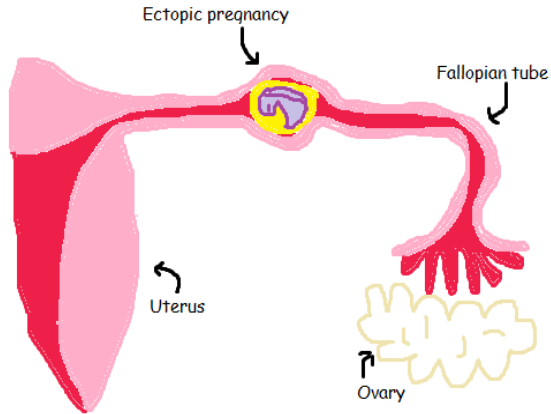


Management of ectopic pregnancy during the early phase of the Coronavirus disease (COVID-19) pandemic in rural Australia

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Introduction:

Ectopic pregnancy is a potentially life-threatening condition and remains a major cause of maternal morbidity and mortality. Historically, surgical approaches have been the gold-standard treatment, however advances in early diagnosis has allowed for other treatment options including medical therapy and conservative management.



In the current Coronavirus disease (COVID-19) pandemic there is limited evidence as to the optimal treatment method for patients with an ectopic pregnancy who are suspected or positive for COVID-19. The following case report describes a COVID-19 positive patient with an ectopic pregnancy in a rural Australian hospital. A literature review will be conducted with the aim of assessing current optimal treatment methods and follow up.

Case description:

We present a case of a 25-year-old nulliparous Caucasian female with a right sided ectopic pregnancy identified on pelvic ultrasound.

At first presentation, she was hemodynamically stable with minimal pain, no active per-vaginal bleeding. Her serum

quantitative beta human chorionic gonadotrophin (hCG) was 3829 IU/L and her pelvic ultrasound showed a right adnexal ectopic pregnancy. She was initially managed medically with methotrexate. Initially the patient was asymptomatic and did not meet current testing criteria for COVID-19. Two days following methotrexate, she developed nasal congestion and loss of taste. A nasopharyngeal viral swab was taken which was positive for COVID-19. Day 8 follow up showed a rising serum beta hCG consistent with failed medical management. The patient underwent laparoscopic partial salpingectomy.

Discussion:

Management of ectopic pregnancy:

There are a number of considerations regarding the use of MTX in the COVID-19 pandemic. Its successful use in the medical management of ectopic pregnancy potentially avoids hospital admission, surgery and exposure of patients and health care workers to COVID-19. However, there are concerns about its immunosuppressive effects with the potential to make patients more susceptible to COVID-19 infection or have more severe COVID-19 illness. The Royal College of Obstetricians and Gynaecologists (RCOG) released guidance stating MTX is unlikely to increase patient's susceptibility to COVID-19 infection at the dose used to treat ectopic pregnancy.

The patient in this case had only mild symptoms of COVID-19. The use of MTX was likely of minimal risk. If the ectopic pregnancy had resolved with MTX treatment, subsequent hospital admission and surgery would have been avoided.

Laparoscopic vs. open surgery in COVID-19 positive patients:

Laparoscopy has not been shown to present a greater risk than open surgery to the surgical team in patients with most viral illnesses, including COVID-19. The minimal risks of viral transmission should be balanced against the benefits of a laparoscopic approach.

Prior to surgery in this patient, a brief was held among the surgeons, anaesthetists and theatre staff. The literature reviewed at this time suggested the surgical team was not at increased risk of acquiring COVID-19 infection by pursuing a laparoscopic rather than an open approach. A decision was made to proceed with laparoscopic surgery in this case.

Anaesthetic considerations:

There has been concern from health care workers about the risk of acquiring COVID-19 from aerosol generating procedures (AGPs). Anaesthetic procedures associated with aerosolisation of viral particles include high-flow oxygen therapy via nasal cannulae, endotracheal intubation, bag-mask-ventilation, positive pressure ventilation, inhalational sedation, administration of nebulised medication, use of an open circuit and open suctioning.²⁵⁻²⁷ Based on recommendations at the time of this case a rapid sequence induction (RSI) was undertaken following pre-oxygenation with a well-fitted facemask. No bag-mask ventilation was performed for sixty seconds whilst awaiting neuromuscular paralysis. Intubation was performed as a first pass with a C-MAC video laryngoscope and the ETT cuff inflated prior to connection to the circuit.

At the end of the case, the patient was extubated. A N95 mask was placed immediately on the patient's face. Oxygen was administered via nasal prongs placed under the mask. Suctioning was not performed at any time. The surgical team doffed and left theatre 20 minutes following extubating.

Operating theatre considerations:

COVID-19 is a highly infectious virus which is mainly spread by respiratory droplets but can also be acquired by contact with contaminated surfaces and objects. Operating rooms should be modified to minimise the risk to health care workers.

At this rural hospital, one operating theatre at this hospital was designated for the management of COVID-19 patients. Unfortunately, this operating theatre was unable to be modified to a negative pressure environment. All non-essential equipment was removed from this operating theatre. All remaining equipment was covered in transparent plastic drapes.

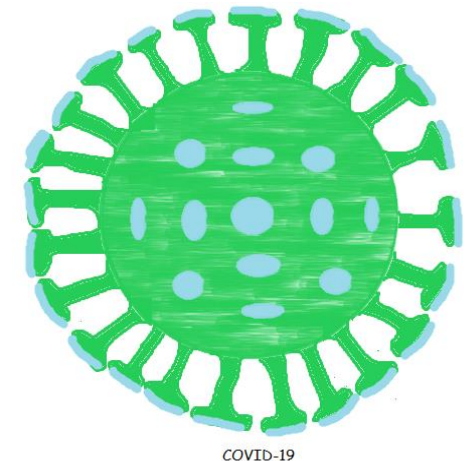
Telephones set to speaker mode were used to communicate between staff inside and outside of the operating theatre. A runner outside the operating theatre, wearing airborne PPE passed additional equipment into the operating theatre.

Conclusion:

Multiple issues need to be addressed in the management of an ectopic pregnancy in a patient with COVID-19. Management of the ectopic pregnancy should follow usual guidelines. Medical management may avoid hospital admission and exposure of health care workers and patients to COVID-19. Current evidence suggests there is a low risk of viral transmission with both laparoscopic and open surgery. Anaesthetic and operating theatre modifications are required to minimise the risk of viral transmission to health care workers.

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