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Original Research Article

Acute Appendicitis in Pregnancy, A Diagnostic Dilemma Treated with Laparoscopic Appendectomy in Tanzania; Case Report

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Abstract: ***Introduction*:** Acute appendicitis during pregnancy is challenging to diagnose due to anatomical and physiological changes. Delay in diagnosis can increase maternal morbidity and foetal loss. Surgical management is necessary however the use of laparoscopy in pregnancy remains limited despite evidence of safety and advantages. **Case *Presentation*:** A 20-year-old primigravida at 19 weeks gestation presented with right-sided abdominal pain and nausea. Clinical examination was equivocal and ultrasound was inconclusive. Had persistence of symptoms despite bowel rest and antibiotics with worsening abdominal pain thus underwent diagnostic laparoscopic which revealed appendicitis thus appendectomy done with appropriate intraoperative precautions. Recovery was uneventful, with no maternal or foetal complications. ***Discussion*:** Diagnosis of appendicitis in pregnancy is hampered by altered pain localization, physiological leucocytosis, and limited ultrasound accuracy. Magnetic Resonance Imaging may improve diagnostic accuracy. Persistence of symptoms with clinical suspicion for appendicitis warrants laparoscopic evaluation and laparoscopic appendectomy offers advantages of faster recovery, lower infection risk, and better visualization of displaced anatomy. Despite guideline endorsements, concerns about foetal safety continue to limit its use. ***Conclusion*:** This case emphasizes the role of clinical suspicion of appendicitis during pregnancy and supports wider adoption of laparoscopy as a safe and effective surgical option when performed by an experienced team. This case highlights diagnostic complexities however illustrates successful laparoscopic approach in Tanzania.

Keywords: Appendicitis in pregnancy; Laparoscopy; Tanzania; Minimal Invasive; Case report.

INTRODUCTION AND IMPORTANCE

Acute appendicitis is the leading non-obstetric surgical emergency in pregnancy, with incidence seen to be highest during the second trimester (Zingone *et al.*, 2015). Prompt diagnosis and intervention are crucial to prevent perforation, peritonitis, preterm labour, and foetal demise. The risks of appendectomy during pregnancy are low for both the gravida and foetus however, appendiceal perforation carries significant morbidity and mortality for both the gravida and the foetus (McGory *et al.*, 2007). The risk of appendiceal rupture is around 2% at 36 hours after symptom onset and rises by about 5% with each additional 12-hour period (Duque & Lotfollahzadeh, 2023).

Diagnosis is particularly difficult in pregnancy due to nonspecific clinical features, altered anatomy, and physiological leucocytosis. Clinical signs and symptoms may be subtle or easily mistaken for normal pregnancy-related changes. In addition, displacement of the appendix by the enlarging uterus can further obscure the clinical presentation. Routine biochemical and laboratory markers typically used to aid in diagnosing acute appendicitis are often less dependable during pregnancy due to normal pregnancy related physiological changes (Brown *et al.*, 2009).

Acute appendicitis can often be diagnosed clinically but due to the increased risks of negative

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appendectomies in pregnancy, imaging is recommended for all pregnant patients with suspected acute appendicitis to improve diagnostic accuracy. Initial study of choice is Ultrasound Sonography (USS) with graded compression of the right lower quadrant with findings for acute appendicitis consistent in pregnant and nonpregnant persons (Parks & Schroeppel, 2011). However, ultrasonography is a user-dependent tool, and the gravid uterus can reduce USS sensitivity and specificity (Khandelwal *et al*., 2013).

Surgical treatment is necessary and traditionally open approach was preferred however, multiple studies and guidelines support laparoscopy as safe in all trimesters (Walsh *et al.*, 2008). Despite proven benefits of laparoscopy, its adoption remains limited, more so in Sub Saharan Africa. We present a case illustrating the diagnostic challenges of appendicitis in pregnancy and highlighting the benefits and safety of laparoscopic management in Tanzania. This paper has been reported in line with the SCARE 2025 criteria (Kerwan *et al*., 2025). This article has been registered with the Research Registry.

Case Presentation

A 20-year-old gravida 2, para 1 at 19 weeks gestation presented with 2 days history of vague right sided abdominal pain, along with nausea and anorexia. She was nauseated throughout this pregnancy however the abdominal pain worried her hence reported to the outpatient gynaecology department. She denied fever, urinary symptoms, change in bowel habit or vaginal bleeding. She denied any significant medical or surgical history other than caesarean section from previous pregnancy due to poor progress of labour.

On examination was afebrile, not pale, not jaundiced with stable vital signs. Abdominal examination revealed tenderness in right upper and lower quadrant with minimal guarding and classical McBurney's point tenderness was absent. Obstetric assessment was otherwise reassuring with a fundal height at umbilicus with normal foetal heart tones. Laboratory findings revealed leucocytosis (14,000/µL) which was nonspecific in pregnancy. Her abdominopelvic USS was inconclusive, revealing only probe tenderness without visualisation of appendix and normal obstetric findings.

She was thus kept on conservative management with bowel rest, antibiotics and serial abdominal examination. Next morning assessment revealed worsening abdominal pain with persistent nausea hence a repeat USS was done revealing significant probe tenderness corresponding to the peri-caecal region which was slightly thickened without visualisation of the appendix or free fluid suggestive of inflammatory process. After multidisciplinary discussion with surgery, obstetrics, radiology and anaesthesia, 72 hours had passed since onset of symptoms and unavailability of rapid Magnetic Resonance Imaging (MRI) thus decision for diagnostic laparoscopy with suspicion for appendicitis with fear of risk of subsequent perforation was concluded.

Patient and husband were counselled on risk of anaesthesia to both mother and fetus along with risk of perforation of appendix and consented to procedure. Intraoperative measures included left lateral tilt positioning and low-pressure pneumoperitoneum (10–12 mmHg) with pre and post featal heart rate monitoring. Three ports were placed with a camera port inserted 3cm above umbilicus using a Visiport. Due to displacement by the gravid uterus 2 more ports were placed in the left upper quadrant and right lower quadrant under visual guidance taking care to prevent uterine manipulation. The appendix was located retrocaecal, inflamed but non-perforated, with thickened mesoappendix and reactive inflamed right fallopian tube which was overlaying the caecum. No other pathology was appreciated and appendectomy was completed uneventfully **(Fig 1)**.

Postoperative recovery was smooth and kept on antibiotics, analgesia and progesterone. The patient ambulated within 12 hours, required minimal analgesia, and had no uterine contractions or foetal distress on continuous monitoring. She was discharged on day 2 post operative on antibiotics, paracetamol only and progesterone with close and regular antenatal follow-up with no complications. Histology revealed partially obstructed lumen, ulcerated appendicular glands surrounded with infiltration of neutrophils and lymphocytes, with transmural inflammation involving muscle and beyond noted up to the serous coat conclusive of acute appendicitis **(Fig 2)**.

Appendix

Fig. 1: Post laparascopic appendectomy specimen which was hyperemic, engorged, thickened measuring 1cm wide and 7cm long, with surrounding fat.

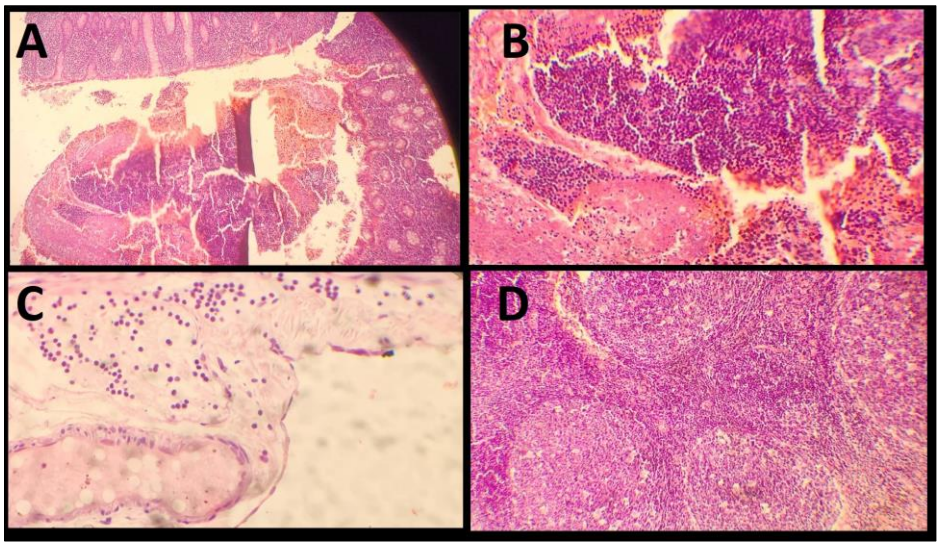

Fig. 2: Histological slides concluding features of acute appendicitis. A + B – Obstructed lumen with exduate and cellular debris within with increased inflamation, blood clots and necrosis. C – Transmural inflmation is noted up to the Serous coat. D – Infiltration of inflmatory cells with collection of lymphoid follicles.

DISCUSSION

Diagnosis of appendicitis during pregnancy is hindered by overlapping symptoms such as nausea, vomiting, and abdominal discomfort. Anatomical displacement of the appendix alters pain localization, particularly in the second and third trimesters (House *et al*., 2014). Laboratory leucocytosis is also unreliable due to normal pregnancy physiology with leucocytosis as high as 16,900 cells/mm3 may be considered a normal finding during pregnancy, particularly in the third trimester (Lurie *et al*., 2008). As with our case, symptomatology and laboratory findings could be associated with both disease process and normal changes in pregnancy hence the need for further work up.

Imaging is essential and while USS is first-line, sensitivity decreases with gestational age due to the displacement caused by the uterus as well as changes in bodily habitus. Abdominopelvic MRI is a highly accurate tool for diagnosing acute appendicitis, with a sensitivity of 91.8% and a specificity of 97.9% in symptomatic pregnant patients (Kave *et al*., 2019). However, because of its high cost and limited availability, the decision to delay appendectomy in order to obtain an MRI should be carefully weighed against the risk of appendiceal perforation, using all available clinical and imaging findings (Khandelwal *et al*., 2013). An emergent MRI with quick reporting is not readily available at all times in Tanzania hence the decision for a diagnostic laparoscopy with possible appendectomy had to be made based of our clinical suspicion with supportive USS findings. Post operative histology confirmed acute appendicitis with inflammation noted up to the serous coat.

Surgical intervention remains the standard of care for acute appendicitis with laparoscopy, once controversial, is now considered safe across all trimesters when performed by skilled surgeons. Benefits include reduced postoperative pain, faster recovery, shorter hospitalization, and superior intra-abdominal visualization to assess for other pathology (Korndorffer Jr *et al*., 2010). Guidelines from Society of American Gastrointestinal and Endoscopic Surgeons and World Society of Emergency Surgery support its use, with precautions such as lateral tilt positioning, use of an open-access approach for initial trocar placement, adjustment of port position for fundal height and controlled pneumoperitoneum to less than 12 mmHg (Gastrointestinal *et al*., 2008; Pearl *et al*., 2017).

Despite these advantages, laparoscopic appendectomy is underutilized due to lingering concerns about foetal safety and lack of expertise in some centres. Meta-analyses show maternal outcomes comparable to laparotomy, with only marginal, non-significant differences in foetal outcomes (Walsh *et al*., 2008). Studies have shown relatively low utilisation of laparoscopy in East, Central, and Southern Africa and even more so in high-risk populations such as pregnancy (Yankunze *et al*., 2024). This case adds to the growing evidence that laparoscopy is safe and effective in pregnancy even in lower income countries, provided that perioperative protocols are followed.

CONCLUSION

Acute appendicitis in pregnancy remains diagnostically challenging due to overlapping symptoms and physiological pregnancy changes. Imaging by be inconclusive and laparoscopy offers a safe and effective surgical option when performed by an experienced team in Sub Saharan Africa, in line with current international guidelines.

Abbreviations:
MRI – Magnetic Ressonance Imagining
USS – Ultrasound Sonography

Declarations of Interest: None.

Consent for Publication: Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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Ethical Approval: Not required for case reports at our institution for single case reports.

Patient Perspective: The patient expressed relief at the rapid recovery and appreciated the minimally invasive approach, which allowed her to recover quickly so as to continue her pregnancy without complications.

Data Availability: The datasets of the present study are available from the corresponding author upon request.

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Declaration of Generative AI and AI-Assisted Technologies in the Writing Process:

During the preparation of this work, the authors used Grammarly to correct sentence grammar and spelling. After using this tool/service, the authors reviewed and edited the content as needed and takes full responsibility for the content of the publication

Author Contribution:
B.A.: Study conception, production of initial manuscript, collection of data, proofreading
Z.M.: Revision of the manuscript, proofreading
M.M: Revision of the manuscript, proofreading
M.H.: Revision of the manuscript, proofreading
A.M.: Production of initial manuscript, collection of data
A.I.: Study conception, production of initial manuscript, collection of data

Highlights:

1. Diagnosis is difficult due to overlapping symptoms, anatomical changes, and nonspecific laboratory findings
2. Diagnostic dilemma in a non-obstetric surgical emergency in pregnancy
3. Laparoscopic appendectomy is safe in pregnancy in Tanzania
4. Despite guideline support, laparoscopy remains underutilized in pregnant patients

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