



ADVANCED ABDOMINAL PREGNANCY: INSIGHTS AND OUTCOMES FROM A TWO-YEAR CASE REPORT AND LITERATURE REVIEW AT A TERTIARY HOSPITAL IN SOUTH AFRICA

Kayembe M. Biduaya*, Niren R. Maharaj, Balandeli S. I. Sonti, and Mikyle David.

University of the Free State, Faculty of Health Science, School of Clinical Medicine,
Department of Obstetrics and Gynaecology.

*Corresponding Author's Email: mauricebiduaya@gmail.com; Tel.: +27 (0) 718468536

Cite this article:

Biduaya, K. M., Maharaj, N. R., Sonti, B. S. I., David, M. (2025), Advanced Abdominal Pregnancy: Insights and Outcomes from a Two-Year Case Report and Literature Review at a Tertiary Hospital in South Africa. African Journal of Health, Nursing and Midwifery 8(3), 150-163. DOI: 10.52589/AJHNM-JGLBGXFP

Manuscript History

Received: 16 Sep 2025

Accepted: 20 Oct 2025

Published: 12 Nov 2025

Copyright © 2025 The Author(s).

This is an Open Access article distributed under the terms of Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0), which permits anyone to share, use, reproduce and redistribute in any medium, provided the original author and source are credited.

ABSTRACT: *Advanced abdominal pregnancy (AAP) is a rare condition posing significant challenges to mothers, babies, and clinicians, especially in low-resource settings. Despite its association with high morbidity and mortality, there is limited data on its diagnosis and management. This retrospective study aimed to review the demographic characteristics, clinical presentation, imaging findings, treatment approaches, and outcomes for mothers and fetuses affected by AAP at Universitas Academic Hospital (UAH) from May 1, 2020, to May 1, 2022. A secondary objective was to enhance diagnostic and management guidelines at the institution. Out of 1129 deliveries during the study period, 11 patients were diagnosed with AAP. The mean age of the patients was 23 years, with 54% being unemployed, 45% using alcohol, and 27% smoking. Notably, 72% of the patients were HIV-positive, with 50% not virally suppressed and half having CD4 counts below 200 cells/ μ L. Additionally, 63% had undergone at least one ultrasound where AAP was missed. The most common symptom was abdominal pain, reported by 72% of patients. The study revealed that only 2 neonates survived, and 1 patient required ICU admission. The findings highlight critical gaps in AAP diagnosis and management, particularly missed diagnoses on ultrasound, and underscore the need for heightened clinical awareness, improved skills, and further research to enhance outcomes.*

KEYWORDS: Advanced abdominal pregnancy, Morbidity and mortality, Feto-maternal outcomes.



INTRODUCTION

Advanced abdominal pregnancy (AAP) is a rare and dangerous form of ectopic pregnancy associated with high perinatal and maternal morbidity and mortality [1]. AAP accounts for 1 to 3 per 10,000 live births and represents about 1.4% of all ectopic pregnancies, with higher prevalence in low-income countries due to limited access to antenatal care and ultrasound facilities [2, 3]. The most prominent risk factor for maternal mortality is severe bleeding caused by placental disruption [3, 4].

AAP is typically diagnosed after 20 weeks of gestation and involves the implantation of the fetus in the peritoneal cavity, excluding the fallopian tubes, ovaries, and other typical ectopic locations [5, 6]. The pregnancy can implant on various abdominal structures, such as the omentum, pelvic sidewall, and organs like the liver and spleen [6]. Due to its rarity and lack of specific symptoms, AAP poses significant diagnostic challenges, and many cases are identified only during surgery [7]. While ultrasound can sometimes detect AAP, MRI is the gold standard for assessing the placental attachment and vascular supply [6].

AAP can be classified as either primary or secondary. In primary AAP, the blastocyst implants directly in the abdominal cavity, while secondary AAP occurs after the pregnancy moves from another location, such as a ruptured fallopian tube [1, 6]. The exact cause of secondary AAP remains unclear, but it is thought to result from previous ectopic pregnancies, uterine surgeries, or heterotopic pregnancies [1].

The pathogenesis of AAP is not well established; however, several theories have emerged regarding the causes of secondary AAP [6]. They include severe hemorrhage, bowel obstruction, preeclampsia, sepsis, and massive blood transfusions [1, 8]. The maternal mortality rate is approximately 12%, while fetal outcomes are often poor, with fetal demise occurring in up to 72% of cases [9, 10].

The management of AAP depends on the stage of pregnancy and the condition of the mother and fetus [5]. If diagnosed before fetal viability, termination of pregnancy is typically recommended [11]. After viability, expectant management may be considered, but it requires careful monitoring in a tertiary care setting, with access to blood products, multidisciplinary care, and neonatal intensive care [1, 5, 16]. There is no consensus on the ideal timing of delivery, but it usually ranges between 30 and 35 weeks [1, 5]. Due to the scarcity of cases and the lack of established guidelines, improving outcomes for AAP requires auditing cases, particularly in low-resource settings [1,6].

There is limited robust information regarding the diagnosis and management of AAP, and the management of AAP is not based on well-established guidelines. Additionally, the diagnosis of AAP is frequently missed due to a lack of a high index of suspicion by the clinician. Therefore, to address this gap, it is necessary to audit cases of AAP, particularly in low-resource settings, to improve patient outcomes.



METHODOLOGY

Study Design and Setting

This case series study analyzed patients with advanced abdominal pregnancy (AAP) at Universitas Academic Hospital (UAH) between May 2020 and May 2022. Located in Bloemfontein, Free State, South Africa, UAH is a tertiary hospital receiving referrals from multiple districts, the Northern Cape, and Lesotho. Ethical approval was obtained from the Health Sciences Research Ethics Committee (HSREC) and the Free State Department of Health.

Study Sample

During the study period, 1129 deliveries occurred at UAH, of which 11 cases of AAP were diagnosed.

Ethical consideration and Informed Consent

Ethics approval was obtained from the Health Sciences Research Ethics Committee (HSREC) of the Faculty of Health Sciences, UFS (ethics approval number UFS-HSD2022/0942) and the Free State Province Department of Health. As this was a retrospective study, informed consent was not required.

RESULTS

Summary of Cases

Case 1: A 42-year-old Gravida 3 Para 2 (G3P2) woman with HIV (CD4 count of 37) presented at 33 weeks gestation with AAP, confirmed by ultrasound and MRI. The placenta was attached to the right posterior peritoneum and bowel. A healthy 1.8 kg neonate was delivered, and the placenta was surgically removed with an estimated blood loss of 750 ml. The patient and baby were discharged without complications.

Case 2: A 43-year-old Gravida 3 Para 2 (G3P2) HIV-positive woman was diagnosed with AAP at 21 weeks with a stillborn fetus. She underwent surgery, where the placenta was attached to the right broad ligament. The estimated blood loss was 1 liter, and the patient was transfused with blood products. She was discharged after 6 days in good condition.

Case 3: A 23-year-old Gravida 2 Para 1 (G2P1) woman with a previous cesarean section was diagnosed with AAP at 23 weeks with a stillborn fetus. Surgery revealed placental attachment to the right broad ligament and omentum, with blood loss of 1.5 liters. She received a transfusion and was discharged after 4 days without complications.

Case 4: A 31-year-old Gravida 5 Para 3 (G5P3) HIV-positive woman presented with fetal demise at 20 weeks. Surgery showed placental attachment to the bowel with vascular supply from the left adnexa. She experienced blood loss of 1.5 liters and was discharged 4 days post-surgery without complications.

Case 5: A 42-year-old Gravida 2 Para 1 (G2P1) woman with HIV and chronic hypertension presented with AAP at 26 weeks with fetal demise. The placenta was attached to the bowel and



pouch of Douglas, and she lost 200ml of blood. No transfusion was required, and she was discharged after 4 days with no complications.

Case 6: A 38-year-old Gravida 3 Para 2 (G3P2) HIV-positive woman delivered a live 2.7 kg baby by cesarean section. The placenta was attached to the transverse colon and left adnexa, with 1 liter of blood loss during a repeat laparotomy. She received blood products and was discharged after 3 days in good health.

Case 7: A 27-year-old Gravida 3 Para 2 (G3P2) woman with HIV, tuberculosis, and a previous cesarean section was diagnosed with AAP at 35 weeks with multiple fetal anomalies. Feticide was performed due to the poor prognosis, and the placenta was removed surgically with 2 liters of blood loss. She required a massive transfusion and stayed in the hospital for 23 days, including 5 days in the ICU. She recovered well after a repeat laparotomy.

Case 8: A 31-year-old Gravida 1 Para 0 (G1P0) woman with a history of infertility and alcohol use was diagnosed with AAP at 24 weeks. The placenta was attached to the rectum and small bowel. Due to fetal distress, she underwent surgery at 31 weeks, delivering a live neonate with compressive deformities. The placenta was removed with minimal blood loss, but the neonate was removed 2 hours after birth.

Case 9: A 37-year-old Gravida 4 Para 3 (G4P3) HIV-positive smoker was diagnosed with AAP during a cesarean section for fetal distress at 28 weeks. The placenta was left in situ, but a repeat laparotomy was performed at UAH to remove the placenta. She lost 200ml of blood and was discharged 4 days after the repeat surgery. The baby was admitted to the NICU for respiratory support.

Case 10: A 37-year-old Gravida 5 Para 4 (G5P4) woman with HIV and preeclampsia was diagnosed with fetal demise and AAP at 32 weeks. Surgery revealed placental attachment to the bowel, with minimal blood loss. She was discharged after 4 days without complications.

Case 11: A 32-year-old Gravida 3 Para 2 (G2P1) woman presented with AAP after being initially misdiagnosed with gestational trophoblastic disease. A CT scan confirmed the diagnosis, and surgery revealed placental attachment to the broad ligament and bowels. She lost 800ml of blood, received 5 units of RCC, and was discharged 6 days post-surgery.

Table 1: Demographic and clinical patient information

Characteristic	Median	Min	Max	Total (n=11)	%
Demographic Profile					
Age (years)	37	23	43	-	-
Weight (kg)	56.5	45	69	-	-
BMI (kg/m ²)	23	18.5	33	-	-



Characteristic	Median	Min	Max	Total (n=11)	%
Gravidity (n)	3	1	5	-	-
Parity (n)	2	0	4	-	-
GA at Booking (weeks)	17	10	25	-	-
Medical History					
HIV status	-	-	-	8	72.72
Previous miscarriage	-	-	-	1	9.09
Previous TOP	-	-	-	1	9.09
Subfertility history	-	-	-	1	9.09
Employment Status					
Employed	-	-	-	2	18.18
Unemployed	-	-	-	6	54.54
No data	-	-	-	3	27.27
Race					
Black	-	-	-	10	90.91
Coloured	-	-	-	1	9.09
Marital Status					
Stable partner	-	-	-	6	54.55
Single	-	-	-	4	36.36
No data	-	-	-	1	9.09



Characteristic	Median	Min	Max	Total (n=11)	%
Social Habits					
Smoking	-	-	-	3	27.27
Alcohol	-	-	-	5	45.45

Table 2: Ultrasound findings before AAP diagnosis (missed pregnancy location)

Parameter	Median	Min	Max	Total (n=11)	%
Ultrasound done	-	-	-	7	63.64
Gestational age (weeks)	18	16	35	-	-
Health Facility Level					
CHC	-	-	-	2	28.57
District Hospital	-	-	-	2	28.57
Regional Hospital	-	-	-	3	42.87
Operator					
Medical Officer	-	-	-	6	85.71
Sonographer	-	-	-	1	14.29
Abnormal Findings					
IUGR	-	-	-	1	9.09
Fetal demise	-	-	-	2	18.18
Breech	-	-	-	1	9.09
Oligohydramnios	-	-	-	1	9.09



Parameter	Median	Min	Max	Total (n=11)	%
Fibroid uterus	-	-	-	1	9.09
Transverse lie	-	-	-	1	9.09
Multiple fetal anomalies	-	-	-	1	9.09

In our study, of the 11 patients reviewed, 7 were referred with a diagnosis of AAP made on an ultrasound examination.

Table 3: AAP diagnosis & Imaging modality

Parameter	Total number (n=11)	Percentage %
AAP Diagnosis		
Referred with AAP diagnosis	7	63.64
Diagnosed at UAH preoperatively	1	9.09
Intraoperative diagnosis	3	27.27
Ultrasound Operator		
Medical Officer	3	42.85
Registrar	2	28.5
Sonographer	2	28.5
Reported Ultrasound Features		
Gestational age / EFW	8	72.72
Fetus location	6	54.5
Fetal anomaly/deformity	2	18.18



Parameter	Total number (n=11)	Percentage %
Fetal heart activity	8	72.72
Amniotic fluid volume	4	36.36
Placenta location	5	45.45
Free fluid (+/-)	6	54.5
Empty uterus	6	54.5
MRI/CT Scan		
MRI	3	27.27
CT scan	1	9.09

Although there was no maternal mortality in our study, most patients (81%) required blood transfusions.

Table 4: Maternal and fetal outcomes

Outcome Measure	Median	Min	Max	Total (n=11)	%
Maternal Outcomes					
Blood transfusion received	-	-	-	9	81.82
Blood Product Type					
RCC-units	3	1	5	8	72.73
FFP-units	3	1	4	4	36.36
Cryoprecipitate-units	1.5	1	2	2	18.18
Cell salvage-ml	750	500	1000	3	27.27
Hosp. stay (days)	4.5	2	57	-	-



Outcome Measure	Median	Min	Max	Total (n=11)	%
Repeat laparotomy	-	-	-	3	27.27
Fetal Outcome					
Born alive	-	-	-	4	36.36
Stillborn	-	-	-	7	63.64
NICU admission	-	-	-	3	27.27*
NICU discharge alive	-	-	-	2	18.18*
Birth weight (grams)	1800	1020	2950	-	-

DISCUSSION

This case series involving 11 patients who presented with advanced abdominal pregnancy (AAP) at Universitas Academic Hospital (UAH) illustrates the considerable diagnostic and management challenges in low-resource settings. AAP is a rare but potentially life-threatening form of ectopic pregnancy, where the embryo implants in the abdominal cavity rather than in the uterus. Despite its rarity, the incidence ratio of AAP in this study (0.97%) was notably higher than reported in previous literature [11]. For instance, during the two-year study period at UAH, 1129 deliveries were recorded, resulting in an AAP incidence rate of 1 in every 102 deliveries. In contrast, Ayinde et al. [11] reported an incidence of 1 in 643 deliveries, while Nunyalulendho et al. [9] reviewed 163 cases and found an incidence of 1 in 8099 deliveries. Another study by Ramphal et al. [5], conducted over 22 years at a Durban hospital, reported 118 cases of AAP, averaging five cases annually. These differences in incidence rates may reflect variations in diagnostic capabilities, population risk factors, or healthcare access, particularly in resource-constrained environments.

One of the notable demographic characteristics of this series was the median maternal age of 37 years, which is higher than the median ages reported in other studies, such as the 31 years reported by Ramphal et al. [5] and the 28 years reported by Ayinde et al. [11]. Advanced maternal age, particularly over 40, is associated with an increased risk of ectopic pregnancy, with an odds ratio of 2.9 [6]. In this study, other identifiable risk factors for AAP included cigarette smoking (three patients), prior cesarean delivery (three patients), fibroid uterus (one patient), and infertility (one patient). These risk factors are consistent with those reported in previous studies, such as Ayinde et al. [11], who also documented cases of infertility in their series. Most patients in this study were of Black African descent (90%), with one patient classified as of colored race, reflecting the racial distribution in South Africa.

The prevalence of HIV among patients in this series is particularly concerning, with 72% (eight patients) testing positive for the virus. This rate is significantly higher than the 30% prevalence



among pregnant women in the Free State province [18]. Of the eight HIV-positive patients, only six were receiving antiretroviral therapy (ART), and half had a CD4 count below 200, indicating significant immunosuppression. Moreover, half of the HIV-positive patients had unsuppressed viral loads. This finding is consistent with other studies; for example, Ramphal et al. [5] also reported a high HIV infection rate (75%) in their cohort, as did Leyva et al. [20], who reported 3 cases of AAP with HIV infection. HIV is a known risk factor for ectopic pregnancy, including AAP, as it is associated with sexually transmitted infections (STIs) and pelvic inflammatory disease (PID), both of which increase the risk of ectopic implantation [6]. Additionally, HIV infection complicates the management of AAP, as it is associated with a higher risk of placental abscess formation, particularly when methotrexate is used.

Other comorbidities in this series included hypertensive disorders of pregnancy, with two patients diagnosed with hypertensive disease and one patient having chronic hypertension. Only one patient presented with preeclampsia. Worley et al. [7], in a series of 10 patients with AAP, reported that three patients had preeclampsia, suggesting a possible link between ectopic placentation and defective endovascular trophoblastic invasion, which could impair normal vessel remodeling and lead to hypertensive disorders. However, the exact pathophysiological connection between AAP and hypertensive disorders remains unclear.

Regarding antenatal care, eight patients (72%) attended ANC before their AAP diagnosis. The median gestational age at booking was 17 weeks, and the median haemoglobin level was 11.15 g/dL. Of these, five patients (45.45%) initiated antenatal care before 20 weeks, in line with South Africa's Basic Antenatal Care (BANC) guidelines. However, early ANC attendance in this series did not correlate with early detection of AAP. The diagnosis of AAP is challenging, especially when ultrasound examinations are not routinely performed or when they fail to detect abnormalities [6]. In this study, seven patients received at least one ultrasound examination, yet AAP was missed in several cases, including one level 3 ultrasound performed by a sonographer. This highlights the operator-dependent nature of ultrasound and the need for improved training and awareness among healthcare providers. Ramphal et al. [5] reported a 50% success rate in diagnosing AAP via ultrasound, emphasizing that a high index of suspicion is necessary when performing routine pregnancy scans, especially in cases with abnormal findings.

Abnormal fetal findings reported on ultrasound before AAP diagnosis in this series included fetal growth restriction, breech presentation, oligohydramnios, and fibroid uterus. These findings are consistent with those reported in the literature [21]. AAP has been associated with various fetal abnormalities, such as malpresentation, reduced amniotic fluid, and fetal malformations [5, 6, 22]. Ramphal et al. [5] also noted fetal growth restriction as a common finding in their cohort of 43 patients with AAP. Fibroid uterus, which was present in one patient in this series, has been linked to AAP in several studies, further complicating pregnancy outcomes [5, 6, 23].

The most common symptom experienced by patients in this series was abdominal pain [8], reported by eight patients (72%). Two patients presented with mild vaginal bleeding. These symptoms are consistent with the literature, where nonspecific abdominal pain throughout pregnancy is commonly associated with AAP [1, 5]. However, the nonspecific nature of these symptoms often leads to misdiagnosis [21]. In this series, AAP was misdiagnosed as uterine rupture or fibroid in several cases, and one patient was misdiagnosed with choriocarcinoma. In



three cases, AAP was diagnosed intraoperatively. Misdiagnosis can delay appropriate management, increasing the risk of maternal and fetal complications.

Fetal outcomes in AAP are generally poor, with fetal demise reported in 76% of cases in the literature [3]. In this series, 36% of patients (four cases) presented with fetal demise, a lower rate than the reported prevalence. The lower rate in this series may be due to the small sample size, but it underscores the need for heightened vigilance in managing pregnancies complicated by AAP [6].

Imaging modalities other than ultrasound, such as MRI and CT scans, were used sparingly in this series due to limited availability. Only three patients received an MRI scan, and one patient underwent a CT scan, which was initially intended to evaluate suspected choriocarcinoma but ultimately led to the diagnosis of AAP [9]. MRI is considered the gold standard for diagnosing AAP, as it provides detailed information on the location and extent of placental attachment. However, in resource-limited settings like UAH, access to MRI is often restricted, and clinicians must rely on other diagnostic tools, which may not always be as effective [6].

Intraoperatively, the most common site of placental attachment in this series was the bowel (63%), followed by the omentum (36%). This contrasts with the literature, where the most common placental attachment sites in AAP are the uterus and adnexa [6]. The vascular supply to the placenta, which is a critical factor in determining whether the placenta can be safely removed, was reported in six cases. The right broad ligament and ovary were the most frequent vascular supplies identified [1]. In cases where placental removal was deemed safe, it was performed during the index laparotomy in nine patients, and in two cases, it was removed during a repeat laparotomy [1, 5].

Placenta removal in AAP is associated with significant morbidity, as illustrated by one case in this series where the patient experienced severe hemorrhage, metabolic acidosis, and disseminated intravascular coagulation (DIC), requiring intensive care. This case highlights the risks associated with unplanned laparotomy in AAP. In line with the literature, Ramphal et al. [5] reported that abdominal packing for bleeding control and management of DIC is sometimes necessary in AAP cases.

In a single case with a viable fetus at 24 weeks, expectant management was attempted to optimize fetal outcomes. The patient had a history of infertility and uterine fibroids, and although the fetus was delivered alive, it exhibited compressive deformities and respiratory distress, ultimately leading to neonatal death. Ramphal et al. [5] reported similar outcomes in their cohort, with most neonatal deaths occurring within 24 hours of birth. These findings highlight the poor fetal and neonatal outcomes associated with AAP, even under expectant management.

In terms of maternal outcomes, there were no maternal deaths in this series, a notable finding given the high morbidity associated with AAP. However, 81% of patients required blood transfusions, reflecting the significant blood loss often associated with this condition. The median hospital stay was 4.5 days, although one patient required a prolonged stay of 57 days due to complications. Repeat laparotomies were necessary in three patients: two for placenta removal and one for the removal of an abdominal swab.



CONCLUSION AND FURTHER RECOMMENDATIONS

AAP presents significant diagnostic and management challenges, particularly in resource-limited settings. Early detection is crucial but often difficult due to limited access to advanced imaging techniques such as MRI. Training healthcare professionals to improve their ultrasound skills and ensuring that antenatal care includes systematic screening for AAP could help reduce maternal and fetal morbidity and mortality. Strengthening the health system, improving access to antenatal care, and enhancing community awareness about the importance of early pregnancy screening are essential steps in mitigating the risks associated with AAP.

AUTHOR CONTRIBUTIONS

- **Kayembe M. Biduaya:** Manuscript writing and developing, data collection and analysis
- **Niren R. Maharaj:** Manuscript writing, manuscript editing and supervision
- **Balandeli S. I. Sonti:** Manuscript supervision, editing and planning
- **Mikyle David:** Manuscript writing, manuscript editing and supervision

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

Conflict of interest

The authors have no conflict of interest.

Ethics approval statement

Ethics approval was obtained from the Health Sciences Research Ethics Committee (HSREC) of the Faculty of Health Sciences, UFS (ethics approval number UFS-HSD2022/0942)

Patient consent statement

As this was a retrospective study and data was collected from patient medical records, no informed consent was required.

Data availability statement

The data that supports the findings of this study is available from the corresponding author upon reasonable request.

Permission to reproduce material from other sources

No permission was required for this case series

Clinical trial registration

No registration was required, as this was not a clinical trial.



REFERENCES

1. McDougall A, Morin A, Kuzmich T, Odejinmi F. Advanced abdominal pregnancy: challenges, update and review of current management. *The Obstetrician & Gynaecologist* [Internet]. 2022 May 16 [cited 2022 May 28]; Available from: <https://onlinelibrary.wiley.com/doi/10.1111/tog.12808>
2. Tegene D, Nesha S, Gizaw B, Befikadu T. Laparotomy for Advanced Abdominal Ectopic Pregnancy. *Case Rep Obstet Gynecol*. 2022;2022.
3. Siati A, Berrada T, Baidada A, Kharbach A. Abdominal pregnancy with a healthy newborn: A new case. *Pan African Medical Journal*. 2019;34.
4. Aliyu LD, Ashimi AO. A multicenter study of advanced abdominal pregnancy: A review of six cases in low-resource settings. Vol. 170, *European Journal of Obstetrics and Gynecology and Reproductive Biology*. Elsevier Ireland Ltd.; 2013. pp. 33–8.
5. Ramphal S, Khaliq OP, Abel T, Moodley J. Expectant management of advanced abdominal pregnancies: Is it justifiable? *European Journal of Obstetrics and Gynecology and Reproductive Biology*. 2023 Feb 1; 281:99–108.
6. Chauhan SP, Dsc H, Bhalwal AB. Abdominal pregnancy [Internet]. 2023. Available from: https://www.uptodate.com/contents/abdominal-pregnancy/print?search=advancedabdominalpregnancy&source=search_result&selectedTitle=1...1/16OfficialreprintfromUpToDatewww.uptodate.com
7. Worley KC, Hnat MD, Cunningham FG. Advanced extrauterine pregnancy: diagnostic and therapeutic challenges. *Am J Obstet Gynecol*. 2008;198(3):297.e1-297.e7.
8. Li Y, Geng J, He Q, Lu J, Xu J, Zhang Y, et al. Abdominal ectopic pregnancy following a frozen embryo transfer cycle: a case report. *BMC Pregnancy Childbirth*. 2021 Dec 1;21(1).
9. Nunyalulendho DN, Einterz EM, Nunyalulendho N. Advanced abdominal pregnancy: case report and review of 163 cases reported since 1946. *Rural Remote Health* [Internet]. 2008;8:1087. Available from: <http://www.rrh.org.au>
10. Ludwig M, Kaisi M, Bauer O, Diedrich K. The forgotten child-a case of heterotopic, intra-abdominal and intrauterine pregnancy carried to term [Internet]. Vol. 14, *Human Reproduction*. 1999. Available from: <https://academic.oup.com/humrep/article/14/5/1372/766221>
11. Ayinde OA, Aimakhu CO, Adeyanju OA, Omigbodun AO, Co A. A Ten-Year Review. Vol. 9. 2005.
12. Ranaei-Zamani N, Palamarchuk T, Kapoor S, Kaler MK, Atueyi F, Allen R. Diagnostic challenges of an abdominal pregnancy in the second trimester. *Case Rep Obstet Gynecol*. 2021;2021.
13. Mforteh AA, Tchakounte C, Sama CB, Eteme-Messi S, Djiognouo W, Dohbit S, et al. Induction of Labour in Advanced Abdominal Pregnancy with Fetal Demise due to Cord Round Neck: A Case Report of a Missed Diagnosis. *Case Rep Obstet Gynecol*. 2018 Sep 25;2018:1–3.
14. Shurie S, Ogot J, Poli P, Were E. Diagnosis of abdominal pregnancy still a challenge in low resource settings: A case report on advanced abdominal pregnancy at a tertiary facility in Western Kenya. *Pan African Medical Journal*. 2018;31.
15. Nassali MN, Benti TM, Bandani-Ntsabele M, Musinguzi E. A case report of an asymptomatic late term abdominal pregnancy with a live birth at 41 weeks of gestation. *BMC Res Notes*. 2016 Jan 19;9(1).
16. Bashir F, Naz R, And ZS, Zafar F. ABDOMINAL PREGNANCY. Vol. 32, *Biomedica*.



17. Rohilla M, Joshi B, Jain V, Neetimala, Gainer S. Advanced abdominal pregnancy: a search for consensus. Review of literature along with a case report. Vol. 298, Archives of Gynecology and Obstetrics. Springer Verlag; 2018.
18. Kufa-Chakezha T, Shangase N, Singh B, Cutler E, Aitken S, Cheyip M, et al. The 2022 antenatal HIV sentinel survey-Key findings. Public Health Bulletin South Africa.
19. 2023 ART Clinical Guidelines for the Management of HIV in Adults, Pregnancy and Breastfeeding, Adolescents, Children, Infants and Neonates. 2023.
20. Rios Leyva W, Nigussie ET, Nonkwelo R, Chb MB, Novikova N, Justus Hofmeyr G. CASE REPORT [Internet]. Vol. 17. 2011. Available from: <http://www.>
21. Ramphal S, ChB M, Khaliq OP, Moodley J. Advanced extra-uterine pregnancy: A review of the literature. S Afr J Obstet Gynaecol. 2020;26(3):121–5.
22. Hoshino T, Mori T, Fujii Y, Yoshioka S. Advanced Abdominal Pregnancy (AAP) after 20 Weeks of Gestation in Japan: A Retrospective Review. Obstet Gynecol Int. 2021;2021.
23. Gidiri MF, Kanyenze M. Advanced abdominal ectopic pregnancy: Lessons from three cases from Zimbabwe and a literature appraisal of diagnostic and management challenges. Vol. 11, Women's Health. Future Medicine Ltd.; 2015. p. 275–9.