

# A true accessory placental lobe: Two case reports of a novel morphological placental anomaly, distinct from succenturiate and bilobed placenta

Erin Whiteford, Andrea Kinnan

## ABSTRACT

**Introduction:** The placenta is a complex organ, originating from both fetal and maternal tissues. Morphological placental anomalies are rare but can result in significant morbidity and mortality for both the fetus and mother. The use of ultrasound imaging to detect these anomalies has led to improved outcomes; however, the use of ultrasound technology for non-medical purposes, such as “keepsake” imaging has proved more controversial.

**Case Series:** These two cases demonstrate a novel morphological placental anomaly, distinct from bilobed and succenturiate placenta. Guidance is provided on the diagnosis and management of a true accessory placental lobe through case reports of a 24 year old in her second pregnancy with a normal fetal anatomic survey (FAS) and history of retained placenta in her first pregnancy and a 37 year old in her third pregnancy also with a normal FAS.

**Conclusion:** We identified a unique variant of succenturiate placenta, described here as a true accessory placental lobe. Although these particular cases resulted in no acute complications, we argue that the potential risks for placental retention, hemorrhage, postpartum infection, and vasa previa are significant. Thus, we emphasize the importance of thorough antenatal ultrasound examination of the placenta, to ensure the safety of both the infant and mother at delivery. This could occur during the recommended ultrasound for FAS

around 20 weeks gestation. Although the non-medical use of ultrasound in one of the two presented cases ultimately resulted in closer follow-up and precautions during delivery, we conclude that the regular use of ultrasound for “keepsake” imaging lacks sufficient evidence of benefit when weighed against the potential harms. However, if an ultrasound is done in the third trimester, regardless of the reason, we recommend thorough placental examination by a trained technician.

**Keywords:** Accessory lobe, Obstetric ultrasound, Placenta, Placenta anomaly, Succenturiate placenta

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## INTRODUCTION

The placenta is essential for in utero development, playing a vital role in the wellbeing of both the fetus and the mother throughout pregnancy. It performs several functions including providing nutrition to the developing fetus, acting as a means for excretion of wastes, as well as performing endocrine and immunologic functions [1]. The development of the human placenta begins with implantation of the blastocyst into the endometrial lining of the maternal uterus [1]. By the end of the first trimester the maternal blood supply to the placenta is complete and by the 18–20th week of pregnancy the placenta is fully formed with distinct fetal and maternal surfaces

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[2]. Although the placenta continues to grow throughout pregnancy, it grows most rapidly during the first trimester [3].

Despite the convoluted process of placental development, placental abnormalities are an uncommon obstetric finding, with succenturiate placenta being considered an especially rare entity. However, pathologies of the placenta are important causes of maternal and fetal intrauterine morbidity and mortality with an incidence of 7–9% in singleton pregnancies and 24–33% in twin pregnancies [3]. There are several known morphological anomalies of the placenta including bilobed and succenturiate placenta.

A bilobed placenta is defined as a placenta with two, roughly equally sized lobes separated by a membrane, with the umbilical cord inserting into either lobe, in a velamentous fashion, or in between the lobes [4, 5]. A succenturiate lobe is defined as being a distinct placental lobe separate from the main placental disc and having vascular connections which run through the membranes connecting the main placenta to the succenturiate lobe [5, 6]. The estimated worldwide incidence of succenturiate placenta is 1.04% [7]. Of note, succenturiate placenta is more commonly found in women age 35 years and older [6]. It is usually diagnosed incidentally, similar to the cases presented here, but should not be considered benign as it is associated with an increased risk for placental abruption, vasa previa and retained placenta, as well as postpartum infection and hemorrhage. On ultrasound, succenturiate placenta is demonstrated when there is no placental tissue bridging the two placental components, rather they are connected by intramembranous blood vessels, with the umbilical cord originating from the main placenta [8].

Here, we identify a unique variant of a succenturiate placenta in which a true accessory lobe was present, delineated by a full thickness connection to the major placental disc, rather than just a connection via vasculature as is seen in succenturiate placenta. These cases demonstrate the importance of astute and thorough prenatal ultrasound screening as well as provide ultrasound imaging of a novel morphological placenta abnormality.

## CASE REPORT

A 24-year-old G2P1001 white female (patient A) presented to the obstetrics clinic for confirmation of pregnancy at 7w3d by last menstrual period (LMP), confirmed by first trimester ultrasound. The patient's past medical history included dilation and curettage for retained placenta in her first pregnancy and appendectomy at 9w0d of this most recent pregnancy. Her prenatal course was uncomplicated including routine prenatal labs and a pap smear that were within normal limits. She declined genetic screening including both noninvasive prenatal testing (NIPT) and carrier screening but received tetanus, diphtheria, and pertussis (TDaP) vaccine per protocol [3, 4].

The second case involved a 37-year-old G3P2002 white female (patient B) who presented for confirmation of pregnancy at 7w0d by transvaginal ultrasound, confirmed with transabdominal ultrasound at 8w3d. The patient's past medical history included remote history of human papillomavirus (HPV) and cervical dysplasia status post (s/p) cryoablation at age 16, precipitous delivery in G1 and G2, anxiety, depression, and tobacco use disorder. Her prenatal course was complicated by her status as an elderly multigravida patient, tobacco use throughout pregnancy (0.5 ppd) and bacterial vaginosis requiring treatment with Metronidazole. Prenatal labs and pap smear were within normal limits; however, gonorrhea/chlamydia polymerase chain reaction (PCR) was declined by the patient. One hour glucose challenge test (GCT) was elevated, prompting the 3 hour glucose tolerance test (GTT) per protocol which was within normal limits and third trimester rectovaginal swab for Group B streptococcus (GBS) colonization was negative. All other routine prenatal labs were obtained and were within normal limits.

Fetal anatomic screening (FAS) ultrasound was done at 19w2d in patient A and 21w1d in patient B and neither showed evidence of irregular anatomy or placentation. Images from the scan showed normal insertion of the umbilical cord into the placenta in both patients (Figure 1A). During the third trimester patient A elected to participate in "Fun Pix," which is an optional ultrasound that allows patients to obtain 3D images of their unborn child. This scan is offered by the clinic outside the standard prenatal imaging protocol and is not an official medical visit. Patient A was 29w1d at the time of her Fun Pix session during which it was noted by the sonographer that there was evidence of a possible succenturiate placental lobe (Figure 1B), not previously identified during FAS. The provider was notified and an official ultrasound was done at 30w1d to re-evaluate the placenta. This ultrasound demonstrated an anterior placenta, no placenta previa and specifically noted that the area, which appeared to be succenturiate on Fun Pix imaging, was well connected to the main placenta and thus was not a true succenturiate lobe (Figure 1C and D). With these results, the patient was followed with expectant management as it was determined that she did not have a succenturiate placental lobe. Patient B did not participate in Fun Pix imaging; however, she did participate in medically indicated ultrasounds in the second and third trimester due to her advanced age and concerns for fetal growth. All ultrasounds demonstrated normal placentation and cord insertion and were done at 28w1d and 36w0d. Unlike in patient A, there were no signs of possible succenturiate lobe visualized on prenatal ultrasound.

Subsequently, patient A and patient B presented to labor and delivery at 37w6d and 37w1d, respectively, and were found to be in labor. Both patients delivered healthy babies via normal spontaneous vaginal deliveries and delivered an intact placenta approximately 4–5 minutes after delivery of their infants. After each of the patient's deliveries, examination of the placenta was conducted and it was noted in each case that there was a lobe, in

addition to the main placenta, connected to the major placental disc via full thickness placental tissue (Patient A: Figure 2A and B). It was also noted that there was normal umbilical cord insertion in both but there were also several calcific deposits throughout the vessels of the placenta in Patient A. Both patients were thoroughly examined for any remaining placenta considering the abnormal placenta findings on gross examination. No remnants of the placenta were found, and the delivery process in its entirety resulted in an estimated blood loss of 400 and 200mL in patients A and B, respectively. The patients had an uneventful recovery, and both moms and babies were discharged the following day without complications. Post-delivery follow-up appointments did not reveal any late postpartum complications.

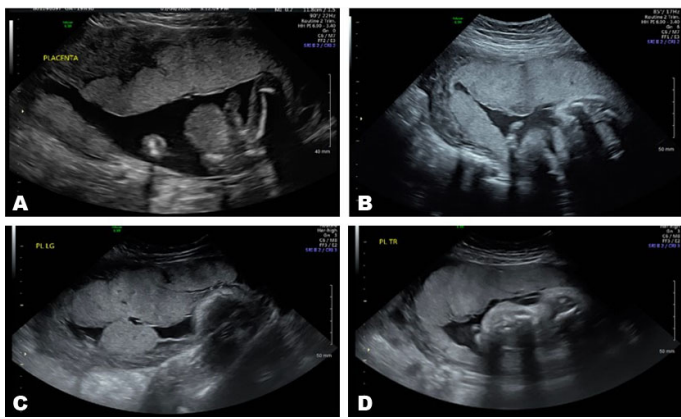


Figure 1: Ultrasound imaging from Patient A: (A) placenta via ultrasound imaging at 19w3d fetal anatomic screening. (B) Fun Pix ultrasound imaging of possible succenturiate placenta lobe incidentally identified at 29w1d. (C, D) Longitudinal and transverse ultrasound imaging of the placenta at 30w1d showing full thickness connection of an accessory placenta lobe rather than a succenturiate lobe.

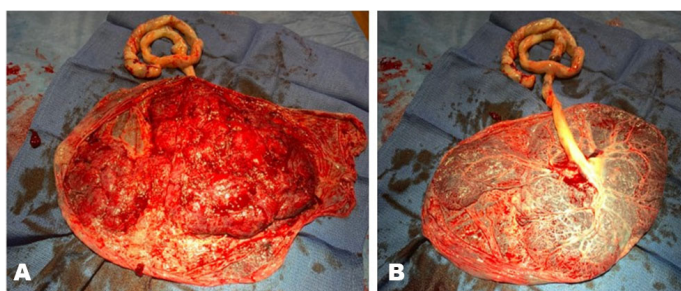


Figure 2: (A) Maternal side of placenta demonstrating full thickness attachment accessory placental lobe in Patient A. (B) Fetal side of placenta demonstrating blood supply to the distinct accessory placental lobe in Patient A.

## DISCUSSION

Based on what is already known about placental development and the current data on the incidence and prevalence of anomalies, placental abnormalities are a rare occurrence. Although the cases presented here encompass similar characteristics to other morphological placental

anomalies, such as bilobed and succenturiate placenta, we argue that it is its own distinct entity. Whereas bilobed placenta is defined as two similarly sized placental lobes, succenturiate placenta is defined as a smaller distinct lobe connected to the main placental disc via vasculature. Further, these cases demonstrated firsthand how easy it can be to miss an abnormality in placentation on prenatal ultrasound screening.

Unfortunately, morphological anomalies of the placenta are often missed on transabdominal ultrasound [6, 9]. Thus, the importance of thorough prenatal screening ultrasounds is a point that ought to be stressed in order to allow patients and the obstetrical team to properly prepare for delivery. As per American College of Obstetricians and Gynecologists (ACOG) recommendation, a fetal anatomy scan is recommended at approximately 20 weeks gestation; however, if a placental abnormality is identified, further monitoring is indicated during the second and third trimester [10]. The question becomes then, whether every woman should be getting an ultrasound in the third trimester to evaluate for growth and placentation or if this would result in more harm and costs than benefit. ACOG recommends obtaining a third trimester ultrasound in the context of placental abnormalities in the setting of suspected placenta previa, placental abruption, or uterine abnormalities; however, it does not recommend that all women receive third trimester ultrasounds [10]. Recommending third trimester ultrasounds in everyone would likely lead to an increase in incidental findings and subsequent invasive procedures, exposing the fetus and mother to unnecessary risks. However, further research is needed to demonstrate this clearly. Of note, if a woman undergoes third trimester ultrasound for a separate obstetrical indication it is recommended that the placenta also be examined thoroughly at that time.

Patient A's case also touches on a more controversial topic: the non-FDA approved use of ultrasound for "keepsake" imaging, or in our case, "Fun Pix." Recently, facilities have been promoting 3D and 4D imaging that uses the latest ultrasound technology in order to produce high resolution images/videos of babies developing in the womb. The lure of these for expecting families is obvious; however, the potential long-term risks of increased exposure to ultrasound are less clear. Ultrasounds have been found to increase or enhance maternal-fetal bonding, specifically, the use of 3D and 4D imaging was found to be preferred by expectant mothers due to the "closeness" it provided [5]. Moms also reported a better understanding of their baby after 3D/4D ultrasounds versus 2D [5]. In contrast, another study demonstrated no difference in maternal fetal bonding with the use of 2D versus 3D imaging when examining this relationship in second and third trimester moms; however, they did find that maternal recognition of the fetus was higher in the 3D group [11].

Although ultrasound is a form of energy, it is largely regarded as safe when properly used. However, it has been shown to produce physical effects in tissue such as jarring vibrations and a rise in temperature [12, 13]. These effects

have not been shown to be harmful to the developing fetus; however, the evidence that these effects exist may mean that ultrasounds are not completely benign. Further, 3D and 4D ultrasound technologies often use higher ultrasound intensities and involve longer exposure times as compared to when used in the traditional medical setting [12, 13]. The commercialization of prenatal ultrasounds has also led to its use by individuals that are not trained and certified in ultrasonography. In our outpatient offices, the “Fun Pix” ultrasound is offered as a compromise in order to encourage our patients to have elective imaging done in a facility with trained sonographers. Furthermore, it has been found that some women have been misled to believe that these elective ultrasounds are true medical screening ultrasounds and the patients are subsequently not properly monitored by a physician [12]. In our outpatient offices, a trained ultrasound technologist performs these elective ultrasounds, which allowed us to identify the potential risk factor in patient A. However, it did also trigger the need for an additional ultrasound to investigate further.

The treatment of morphological placental anomalies typically involves increased prenatal monitoring and careful delivery planning to avoid intrapartum hemorrhage, retained placental tissue, and postpartum hemorrhage. This preparation could include ensuring proper equipment necessary for surgical removal of retained placental parts is available at the time of a vaginal delivery or even planning for a cesarean section depending on the location of the placental anomaly. Although astute ultrasound is beneficial, in those patients whose placental anomalies are not prenatally diagnosed, examination of the placenta postpartum is essential. Yetter described an efficient methodology for postpartum examination of the placenta in order to maximize safety and positive outcomes for both the infant and the mother [14]. Specifically, he suggests examining both the maternal and fetal surfaces of the placenta for completeness, general color, consistency, odor, and texture, as well as thorough exam of the umbilical cord [14]. Examination for completeness entails exam of the maternal surface to make sure all cotyledons are present and intact as well as examining the fetal surface beyond the edges of the placenta for large vessels, which may indicate the possibility that a placental lobe may have been retained [14].

The cases presented here demonstrate a unique variant of succenturiate placenta in that the accessory lobe was connected to the major placenta via full thickness placental tissue while still forming a definite island, separate from the rest of the placenta. This is contrasted from standard succenturiate placental lobes, which are connected to the main placenta only by intramembranous vessels while still being distinct from a bilobed placenta in that the island was significantly smaller than the major placental lobe (Figure 2A and B). With accessory placental lobes physicians are typically concerned about placental retention, however because our patients’ accessory lobes were connected via full thickness tissue it may have been

able to separate from the endometrial tissue easier than if it had been a true succenturiate lobe.

A case report by Perlman and Carusi provided evidence of a patient’s prior history of retained placenta potentially predisposing her to placental abnormalities in her future pregnancies. However, further studies will be needed to elucidate this as a potential risk factor [15]. Although the patients and infants in our cases did not experience immediate complications, a thorough examination of the placenta postpartum, and the uterus to exclude potential placenta retention, are essential for patient safety.

## CONCLUSION

The potentially fatal consequences of placenta pathologies make this a rapidly evolving area of study. The current literature on morphological anomalies of the placenta is expansive; however, it is lacking when pertaining to the identification and management of a true accessory placental lobe. These cases demonstrated a unique morphological placental finding while also emphasizing the importance of antenatal ultrasound and postpartum placental examination. It also provided novel images to further contribute to education in the identification and diagnosis of placental abnormalities. Further, these cases allowed for the discussion of the benefits and risks of elective prenatal ultrasound use, an area of obstetrics that will continue to evolve. Based on several unknowns about the long-term risk of higher intensity ultrasound technology as well as the potential false reassurance of a “normal” keepsake ultrasound where images are not reviewed by a trained radiologist or obstetrician, we agree with the FDA and recommend against the use of nonmedical ultrasounds while still recognizing the potential benefits of ultrasound technology in helping to develop the maternal fetal bond.

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### Author Contributions

Erin Whiteford – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the

version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Andrea Kinnan – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

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### Conflict of Interest

Authors declare no conflict of interest.

### Data Availability

All relevant data are within the paper and its Supporting Information files.

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