

Abnormally adherent and invasive placenta: a spectrum disorder in need
of a name

Running head: AAIP: spectrum disorder in need of a name

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Keywords: placenta accreta, Morbidly adherent placenta, Abnormally invasive
placenta, Nomenclature, standardisation

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There is little doubt that the worldwide Cesarean delivery epidemic has led to
an increased incidence of abnormally adherent and invasive placentation. The

This article has been accepted for publication and undergone full peer review but has not
been through the copyediting, typesetting, pagination and proofreading process, which
may lead to differences between this version and the Version of Record. Please cite this
article as doi: 10.1002/uog.18982

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significant impact that this disorder has on maternal morbidity and mortality has led to a flurry of publications in the literature concerning all aspects of the condition. These papers have arisen from many sources, notably pathologists, epidemiologists, obstetricians and radiologists. Consequently, the terminology used to describe this complex disorder is becoming increasingly disjointed, confusing and perhaps misleading. For instance, two studies published in this issue of the Journal, addressing the first-trimester diagnosis and subsequent outcomes of abnormally adherent and invasive placentation^{1,2}, both refer to the disorder as abnormally invasive placenta, yet in two recent reviews, also published in the Journal, it was referred to as morbidly adherent placenta^{3,4}. If we are to improve our understanding of this complex and multifactorial disease, surely the first move the scientific community has to make is to agree on a name?

Numerous terms are being used currently to describe this spectrum disorder. A recent systematic review found that out of 58 studies related to ultrasound-based prenatal diagnosis, seven used the term 'morbidly adherent placenta', two used 'placental adhesive disorders', two 'abnormally invasive placentation', two 'abnormally adherent placenta' or 'abnormal placental adherence', one 'advanced invasive placentation' and one used the term 'abnormal myometrial invasion' to describe the disorder⁵. We believe that the time has come for experts across disciplines to combine the clinical presentation of the condition with its underlying pathology, and agree upon a more precise and useful terminology. This will help us all to better understand the disease process and make more accurate prenatal diagnosis allowing appropriate management.

When considering an appropriate terminology, the pathological diagnosis of abnormal placental adherence and invasion must be taken into account. Pathologists use 'placenta accreta (or creta)' when the villi adhere to the myometrium, 'placenta

increta' when the villi invade the myometrium and 'placenta percreta' when the villi invade through the uterine serosa. Lumping the three different pathological diagnoses into 'placenta accreta' to define the clinical presentation of the condition has led to considerable confusion, particularly among more junior obstetricians. An attempt to clarify the overarching terminology may be the term morbidly adherent placenta or abnormally invasive placenta, but neither term can describe accurately the spectrum of the disorder. We think the term morbidly adherent placenta is perhaps the least appropriate, because it implies abnormal adhesion (perhaps related to disrupted decidua) and does not precisely include abnormal invasion (increta and percreta), which tends to cause the greatest maternal morbidity and mortality.

The term 'Morbidly adherent placenta' was first used in 1885 by Macdonald to describe a case of 'partial placenta adhesion' complicated by retention of cotyledons, which he treated successfully with 'opiate, ergot and brandy'⁶. This terminology then disappeared from the medical literature for 100 years. It was reintroduced briefly in 1985 to describe cases requiring postpartum hysterectomy in the management of secondary postpartum hemorrhage after Cesarean section^{7,8}. With no rational explanation, it started being used again to describe the ultrasound and magnetic resonance imaging signs of abnormally adherent and invasive placenta⁹ and has been used increasingly since, appearing to be gaining ground as the 'fashionable' term. However, we believe that the term morbidly adherent placenta should not be used to describe this spectrum disorder as it fails completely to address abnormal invasion.

Irving and Hertig (1937) were the first to define the condition known clinically as 'the abnormal adherence of the afterbirth in whole or in parts to the underlying uterine wall' and histologically as 'the complete or partial absence of the decidua

basalis'¹⁰. They reviewed 86 cases reported in the literature up to 1935, including a few cases of 'deeper placentation' producing placenta 'increta' or 'percreta', which were all included under the umbrella term 'placenta accreta'. In 1966, Lukes *et al.* criticized the overarching definition of 'placenta accreta' encompassing both abnormal adherence and abnormal penetration of placental villi into the myometrium¹¹. They suggested that it would be much simpler to provide a clinical diagnosis of 'adherent or invasive placenta'. Human placentation is physiologically invasive and therefore, the term was corrected to '*abnormally* adherent or invasive placenta'. Follow-up histopathology would then subdivide the final diagnosis into accreta, increta or percreta as appropriate.

Including the classification of pathologists into accreta, increta or percreta may be important to better understand the underlying pathophysiology of the disease process and the predictive value of prenatal imaging studies. Following his review of the world literature between 1945–1969, the pioneering placentologist H. Fox noted that 'the difficulties encountered in attempting to determine the true incidence of placenta accreta reflect, to a considerable extent, problems in the definition of this condition'¹². His review also highlighted that, in many cases, the diagnosis of placenta accreta 'rested entirely upon clinical grounds' with no attempt to obtain the pathological examination of hysterectomy specimens. A recent systematic review detailed correlations between ultrasound findings and pathological diagnosis and found that only 72/1078 cases had tissue-based pathological descriptions². The lack of detailed histopathological information in the other cases may explain why no ultrasound sign, or a combination of ultrasound signs, is specific to the depth of abnormal placentation. This deduction has an impact not only on diagnostic accuracy but also on epidemiological data and management options. In fact, many clinicians consider the requirement of manual removal of the placenta as a surrogate

for at least a partial placenta accreta⁹. This assumption is likely to be incorrect. Not surprisingly then, the reported prevalence of abnormally adherent and invasive placentation varies widely between studies, and the frequency may reflect differences in terminology rather than variance in pathophysiology.

Recently, a new term 'placenta accreta spectrum' (PAS) was proposed to encompass all degrees of abnormally adherent and invasive accreta placentation¹³. This term is gaining in popularity and has been used in the new guidelines of both the Royal College of Obstetricians and Gynaecologists (RCOG)¹⁴ and the Federation International of Gynecology and Obstetrics (FIGO)¹⁵. The International Society for Abnormally Invasive Placenta (IS-AIP; formerly the European Working Group on Abnormally Invasive Placenta), however, still recommends the use of the term abnormally invasive placenta¹⁶, as does the Ad-hoc International AIP Expert Group that recently published an ultrasound reporting proforma¹⁷. Neither term is perfect; PAS still includes 'accreta' which could lead to confusion over the more invasive end of the spectrum, and abnormally invasive placenta does not address abnormally adherent placentation.

For the term to cover accurately the full spectrum of the disorder, we suggest that the definition of Lukes *et al.*¹¹ should be considered and 'abnormally invasive placenta' should be changed to 'abnormally adherent and invasive placenta'. It is difficult to propose the best way for the scientific community to move forward and decide between these two names. However, if we are to improve our understanding of this complex condition, facilitate prenatal imaging research and ultimately enhance patient care, we must have a clear, precise and consistent terminology to define it.

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