Placental Bed Disorders
Placental Bed Disorders

Basic Science and its Translation to Obstetrics

Edited by

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The role of the placental bed in normal pregnancy and its complications has been intensively investigated for 50 years, following the introduction of a technique for placental bed biopsy. It is now recognized that disorders of the maternal–fetal interface in humans have been implicated in a broad range of pathologic conditions, including spontaneous abortion, preterm labor, preterm premature rupture of membranes, preeclampsia, intrauterine growth restriction, abruptio placenta and fetal death.
We would like to dedicate this book ‘Placental Bed Disorders’ to the late William B. Robertson (1923–2008), who was one of the ‘founding fathers’ of placental bed research.

William (Bill) Robertson began to conduct collaborative research with Geoffrey Dixon, who had been at the Hammersmith Hospital (London, UK) when they both joined efforts at the University of the West Indies in Jamaica (1956–1964). Hypertension in pregnancy and its complications was a common and important problem in Jamaica.

William Robertson and Geoffrey Dixon introduced a new technique in which uterine tissue beneath the placenta was obtained during a cesarean delivery for histological studies. They coined the term ‘placental bed biopsy’ for this procedure, which led not only to a greater appreciation of the normal development of the maternal blood supply to the placenta, but also demonstrated the vascular changes occurring during hypertensive pregnancies.

This work continued when both Professors Dixon and Robertson returned to London. Further developments occurred in conjunction with Professor Marcel Renaer at the Department of Obstetrics and Gynaecology at the University of Leuven, Belgium, and in particular, with Professor Ivo Brosens, whom Bill had met when he was a Research Fellow with Professor Dixon at the Hammersmith Hospital.

In 1972, Bill Robertson spent a sabbatical year at the Catholic University in Leuven. This was an exciting time for all involved and led to the creation of a new research unit at the Catholic University, which was devoted to improving the understanding of the cellular and molecular biology of the placental bed. This unit expanded with the appointment of Professor Robert Pijnenborg, who joined the unit as Principal Investigator and scientific leader of the unit.

It was fitting that Bill Robertson was invited to open the International Symposium on the Placental Bed held in Leuven in 2007. Unfortunately, he was unable to join us at the meeting. However, committed to the milestone of 50 years of placental bed research, he sent a message to be shared with scientists and clinicians gathered in Belgium. In his message, Bill expressed how
as Visiting Professor in the Department of Obstetrics and Gynaecology at the Catholic University he enjoyed some of the most stimulating, productive, and happiest times in his career and life.

We honor Bill Robertson for his contributions, teachings, and inspiring example.

The Editors
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Ivo Brosens
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Preface

The role of the placental bed in normal pregnancy and its complications has been intensively investigated for 50 years, following the introduction of a technique for placental bed biopsy. It is now recognized that disorders of the maternal–fetal interface in humans have been implicated in a broad range of pathological conditions, including spontaneous abortion, preterm labor, preterm premature rupture of membranes, pre-eclampsia, intrauterine growth restriction, abruptio placentae, and fetal death.

These clinical disorders (referred to as ‘obstetrical syndromes’) are the major complications of pregnancy and leading causes of perinatal and maternal morbidity and mortality. Moreover, recent evidence indicates that these disorders have the potential to reprogram the endocrine, metabolic, vascular, and immune responses of the human fetus, and predispose to adult diseases. Thus, premature death from cardiovascular disease (myocardial infarction or stroke), diabetes mellitus, obesity, and hypertension may have their origins in abnormal placental development.

This is the first book devoted exclusively to the anatomy, physiology, immunology, and pathology of the placental bed. Experts in clinical and basic sciences have made important contributions to bring, in a single volume, a large body of literature on the normal and abnormal placental bed. Thus, readers will find informative, well-illustrated, and scholarly contributions in the cell biology of the placental bed, immunology, endocrinology, pathology, genetics, and imaging.

The aim of the book is to inform the reader about the exciting developments in the study of the placental bed as well as the novel approaches to the assessment of this unique tissue interface and its implications for the diagnosis and treatment of complications of pregnancy. It is believed that this book will be essential reading for those interested in clinical obstetrics, maternal–fetal medicine, perinatal pathology, neonatology, and reproductive medicine. Those interested in imaging of the maternal–fetal circulation or its interrogation with Doppler would also benefit from reading this book.