

# The Obstetrician Confronts Postpartum Hemorrhage

M. E. Setchell

## INTRODUCTION

During the author's career in obstetrics, spanning more than 40 years, one of the most striking changes has been that the individual obstetrician no longer has to deal with the problem of PPH alone, but can call on a sophisticated team of helpers, involving a whole range of other specialists. A mere glance at the contents of this book confirms that the modern management of major PPH now involves a team of anesthetists, hematologists, vascular surgeons, gynecologists and radiologists. Clearly, this change represents an advance which has saved and will continue to save countless lives, not only in the developed world where such teamwork is routine, but also in developing nations that are desperately looking for means to reduce maternal mortality as part of their efforts to comply with the United Nations Millennium Development Goals by the year 2015.

## HISTORICAL PERSPECTIVE

In the middle of the 19th century, maternal mortality was around 6 per 1000 live births, and, of those deaths, about one-third were related to puerperal sepsis; the remainder were classified as 'accidents of childbirth', which included ante- and postpartum hemorrhage and deaths from obstructed labor. Table 1 shows birth and

death rates in England and Wales from 1847 until 1901<sup>1</sup>. During this period, there was no real improvement in the number of deaths from sepsis in contrast to a relative improvement in deaths from other causes.

The concept of 'lying-in' hospitals was first adopted in the mid-18th century, and by 1904 there were 38 such hospitals in Great Britain. The stated intention was to provide a safer place for delivery and postnatal care, but any purported benefits in better obstetric care were far outweighed by the risks of death from sepsis, which, as seen in Table 2, amounted to 3% in the period of 1838–1860<sup>1</sup>. This appalling figure improved considerably during the latter part of the 19th century, as a result of acceptance of Semmelweis' observations and teachings on hygiene and antiseptics in 1861<sup>2</sup>.

Francis Ramsbotham, the first Lecturer and Obstetric Physician to The London Hospital, published *The Principles and Practice of Obstetric Medicine and Surgery in*

**Table 2** Number of deliveries, deaths and death rates during different time periods in the General Lying-in Hospital, London<sup>1</sup>

Time period	Deliveries	Deaths	Average death rate from all causes
1838–1860	5833	180	1 in 32.5 or 30.85 per 1000
1861–1879	3773	64	1 in 57.87 or 16.96 per 1000
1880–1887	2585	16	1 in 161.5 or 6.18 per 1000
1888–1892	2364	9	1 in 262.67 or 3.80 per 1000

**Table 1** Mortality in childbirth in England and Wales 1847–1901 (a period of 54 years)<sup>1</sup>

Year	Registered births of children born alive	Deaths			Death rate per 1000 children born alive, from		
		Puerperal septic diseases and accidents of childbirth	Puerperal septic diseases	Accidents of childbirth	Puerperal septic diseases and accidents of childbirth	Puerperal septic diseases	Accidents of childbirth
1847	539,965	3226	784	2442	5.97	1.45	4.52
1852	624,012	3247	972	2275	5.20	1.56	3.64
1857	663,071	2787	836	1951	4.20	1.26	2.94
1862	712,684	3077	940	2237	4.32	1.32	3.00
1867	768,349	3412	1066	2346	4.44	1.39	3.05
1872	825,907	3803	1400	2403	4.60	1.70	2.90
1877	888,200	3443	1444	1999	3.88	1.63	2.25
1882	889,014	4524	2564	1960	5.09	2.89	2.20
1887	886,331	4160	2450	1710	4.69	2.80	1.90
1892	897,957	5194	2356	2838	5.78	2.62	3.16
1897	921,693	4250	1836	2414	4.61	1.99	2.62
1901	927,807	4394	2079	2315	4.73	2.24	2.49

*Reference to the Process of Parturition* in 1841, and provided some poignant case reports describing what the practice of obstetrics was like at that time<sup>3</sup>. The case of a rich patient in the City of London, described below, illustrates how little could really be done for intra- and postpartum hemorrhage in 1841.

#### 'Case CIV

I was summoned to a private patient near the Mansion House, who had been, a few minutes before, attacked with a sudden flooding in the eighth month of pregnancy, while sitting with her family at tea, in the drawing-room. Upon proceeding up stairs, tracks of blood were perceptible upon every step. In the bedroom, I found a neighboring professional gentleman, who had been also called by the servants in their alarm at the state of their mistress; and, although this unfortunate occurrence had not happened a quarter of an hour before, it had already produced such a degree of compression as I have rarely witnessed, with its concomitant symptoms. Upon a vaginal examination a little after six, I detected the Placenta to be placed immediately over the Os Uteri; some discharge was still oozing away, but there was no tendency to pain. The urgency of the hemorrhage appeared therefore to be at present somewhat abating; and the lady for a short time seemed disposed to revive; but presently the flooding returned with its original violence. Anxiously watching its progress for a short time, and observing no diminution in the discharge, I determined on delivery; but previously I requested my professional friend to satisfy himself that the Placenta was presenting. Being answered in the affirmative, I proceeded without further loss of time to empty the Uterus. The Os Uteri was but little opened, yet it was relaxed, and permitted the passage of my hand with ease into the Uterus; but that organ showed at the moment no disposition to active contraction; having brought down the breech, the child was found to be alive; I therefore proceeded gently in its extraction; and after the child was born, the Placenta was thrown off, and was soon withdrawn. The uterine tumor [uterus] proved now to be irregularly contracted, and fell flaccid under the hand. For a short time, this lady appeared comfortable; the discharge ceased, and she expressed her warmest thanks for my prompt assistance; but by-and-by she began to complain of her breath: 'Oh! my breath! my breath!' was her urgent exclamation. My patient continued to sink, and expired soon after seven o'clock; so that in less than two hours, from an apparent state of perfect health, her valuable life was sacrificed to a sudden attack of hemorrhage, in spite of the most prompt assistance. The child was lively, and promised to do well.'

#### THE LONELINESS OF THE OBSTETRICIAN

Fifty years ago, and for the ensuing 20 years at least, *Practical Obstetric Problems* by the late Professor Ian Donald, Professor of Midwifery in the University of Glasgow, was the essential and valued textbook for all young obstetricians of that day<sup>4</sup>. Nowhere is the famous dedication in the frontispiece more relevant than in relation to PPH:

'To all those who have known doubt, perplexity and fear as I have known them,  
To all who have made mistakes as I have,  
To all whose humility increases with their knowledge of this most fascinating subject,  
This book is dedicated.'

The sense of helplessness, loneliness and fear that Dr Ramsbotham must have felt as he watched his patient expire in spite of all his good work and intentions is something that none of us ever wish to experience in our career.

As modern obstetricians, at least those who are in well or moderately resourced countries, we no longer perform our tasks in isolation. We practice in hospitals which, in the majority of instances, are well or relatively well equipped; we are supported by midwives, junior or senior colleagues, and know that various other skilled specialists can be called in for support. Nevertheless, in dealing with PPH, there comes a moment when our decisions and actions (or lack thereof) determine the sequence of events. Even in complex cases of more prolonged hemorrhage, when all the support of the laboratory hematologists, the blood transfusion service, the anesthetic intensivist and other supporting clinicians has been called in, there comes a time when only the attending obstetrician, using his or her best and most considered judgments, has to make a decision about radical treatments such as hysterectomy, laparotomy and hemostatic suturing, ligation of vessels or embolization.

The author's first 'lone' experience with PPH occurred whilst working as a new registrar at the University Hospital of the West Indies in Jamaica. Having just successfully conducted a very straightforward twin delivery, including completion of the third stage of labor with a standard dose of syntometrine, my state of calm was interrupted by a sudden gush of blood of such proportion that it seemed then (and even now) as if an old-fashioned bath tap had been turned on full force. The sound and sight of that hemorrhage will never leave my memory; it was a moment of absolute panic and helplessness. Miraculously, something took over, and decisions and actions were taken as if they were automatic, probably because Professor Ian Donald had been read, and re-read, in preparation for such an event. Bimanual compression, intravenous ergometrine administered by a much more experienced midwifery sister, who then made up a bottle of intravenous Syntocinon® almost without being asked, and the situation was quickly under control. The young obstetrician grew significantly in maturity and experience in those few minutes, grateful that simple actions had averted what had seemed a potential disaster.

During the remaining years of my training, other dramatic postpartum hemorrhagic situations also occurred, but the range of available interventions was limited. Intravenous or intramuscular ergometrine, intravenous Syntocinon infusions, bimanual compression, or packing the uterus with enormous packs (one teacher described putting a pillow case into the uterus first, and then filling it with as many packs as one could get hold of) were the only effective treatments. One had occasionally seen the need for postpartum hysterectomy and internal iliac artery ligation, but, in those circumstances, there had always been the welcome presence of a more senior colleague.

It is not only the trainee obstetrician who is faced with hard decisions. Sometimes, the presence of a large team leads to confusion of leadership. Whilst protocols, guidelines and practice 'drills' may help to coordinate teamwork and familiarize staff in how to deal with these unusual situations, there remain times when the obstetrician has to take command and make rapid or difficult decisions. Even a very experienced obstetrician may be faced with a situation that is unique and not been met with before. Some memorable and rare such cases which have faced the author are now discussed.

#### Case number 1

A patient had been admitted at 34 weeks with severe abdominal pain, a tense abdomen and absent fetal heart tones. Signs of shock and the tense, tender abdomen suggested a placental abruption, and the cardiovascular and respiratory collapse was of such severity that she was immediately transferred to the intensive care unit (ITU), with a presumed diagnosis of placental abruption. Despite massive blood transfusion, her condition deteriorated, and, despite ventilation, it was difficult to maintain her  $pO_2$ . The ITU team felt that attempts to induce labor needed to be delayed until her condition improved. Eventually, ventilation resistance was so great that the ITU team was of the opinion that death was imminent. The obstetrician was therefore asked to consider carrying out a laparotomy and delivery of the dead baby in the hope that this might improve the situation. As the patient was deemed too ill to leave ITU, the operation was performed on an ITU bed. On entering the abdomen, a massive hemoperitoneum was encountered, and the first thought was of a ruptured uterus. However, the uterus was found to be intact, and after further exploration, it became obvious that the source of the intra-abdominal hemorrhage was a ruptured liver. A general surgeon was called, who then secured hemostasis with several large hemostatic liver sutures, and the patient made a slow recovery. During the postoperative period, however, it became apparent that she developed the HELPP (hemolysis, elevated liver enzymes, low platelets) syndrome. A stormy recovery ensued, but a year later the patient was pregnant again and delivered a healthy baby.

#### Case number 2

Another once-in-a-lifetime experience concerned a late vaginal termination at 18 weeks for a major chromosomal abnormality. During the procedure, it was apparent that the uterus had been perforated and a laparotomy was therefore carried out. A small tear was found in the cecum and a general surgeon called in. He recommended partial right colectomy, which was elegantly performed, and the perforation of the uterus closed without difficulty. A drain was left in the abdomen. An hour later, it was evident that there was major intra-abdominal hemorrhage. The drainage

bottle had filled and been emptied twice, and the abdomen was distended, tense and tender. Unfortunately, the general surgeon had departed for the weekend and was not contactable. When the obstetrician returned, the patient was in a desperate condition, with major cardiovascular collapse. The anesthetist had inserted a subclavian line in order to obtain good venous access, and in doing so had inadvertently caused a pneumothorax. He was therefore inserting a chest drain. Once this had been accomplished and transfusion had restored the blood pressure, a laparotomy was carried out by the obstetrician. A small arterial bleeder was found at the ileo-colic anastomosis and was easily dealt with. The patient, who was the wife of a solicitor, made an uncomplicated recovery. The obstetrician expected that he might find a legal suit impending, but instead received a case of champagne and letter of thanks from the solicitor husband. This lady also subsequently went on to have a successful pregnancy.

#### Case number 3

On yet another occasion, the author was called in at 3am by a consultant colleague because a patient who had had a vaginal delivery with a very extensive vaginal and perineal laceration was still bleeding heavily after more than an hour of attempted suturing of the tear, and no fewer than 18 units of blood had been transfused. The operating theater looked like a battlefield theater, and the vaginal tissues appeared like wet blotting paper, with no identifiable anatomical layers. By then, the patient had major clotting deficiencies, and anesthetists and hematologists were busy attempting to correct that. Attempts were made at packing the vagina and applying pressure, but to no avail. A gynecological oncology colleague was contacted to discuss internal iliac artery ligation, and he advised that this should be done forthwith. The author had not participated in such a procedure for something like 20 years, and, although the gynecological oncologist said he would come in, he advised that time should not be wasted in getting on with the procedure. To the author's relief, the requisite details of the anatomy and necessary procedure were retrieved from the cerebral archive almost automatically. By the time the oncologist arrived, the hemorrhage was almost completely under control, and it was then possible to complete hemostasis with a few additional vaginal sutures. After a short period of intensive care, the young woman recovered well, as did the anatomy of the vagina and perineum.

#### Case number 4

A final case involved a collapse at 36 weeks, with abdominal distension and extreme pain and tenderness. The fetal heart tones were still present, and the presumed diagnosis was placental abruption. The patient was immediately taken to theater for cesarean section. On opening the peritoneum, a massive

hemoperitoneum gushed forth, but the uterus was perfectly soft and normal in color. A cesarean section was carried out and a healthy baby delivered. It was first thought that the source of bleeding might be a ruptured splenic arterial aneurysm, and a four-quarter exploration of the abdomen was carried out. However, the upper abdomen revealed no bleeding whatsoever, and eventually an arteriovenous malformation at the brim of the pelvis was found to be bleeding. A vascular surgeon was called in to check that hemostasis was satisfactory. After an 8-unit blood transfusion, the patient and baby did well.

## CONCLUSION

The plethora of interventions available to the obstetrician now includes many different drugs to promote uterine contraction and hemostasis, a complex range of hematological products and surgical interventions, including the B-Lynch suture, the use of intrauterine pressure balloons, and early resort to hysterectomy or radiological embolization. All are described in detail in other chapters of this book. However, decisions about which intervention to try, and after how much blood loss, remain difficult, and are influenced by the likely future reproductive wishes of the woman, as well as the facilities or lack thereof available in the particular obstetric unit. Whilst much progress has been achieved in the past few decades, there remain many parts of the world where treatment options either are not much greater than they were 50 or more years ago in more developed countries or are even less, being hampered by the logistic considerations detailed in still other chapters in this volume.

Good maternity departments will ensure that cases of serious hemorrhagic incidents, particularly those with such unusual features, are reviewed at multi-disciplinary department meetings to rectify any deficiencies in care, and benefit from the learning points.

The major challenge in the 21st century in this field is to narrow the inequalities of health care provision in childbirth. It is hoped that this textbook, will go a long way in helping health care providers to achieve this goal, for it should be obvious, even to the most neophyte reader, that the problems related to PPH are not confined to one country or to one region. They are indeed worldwide, and their control will be facilitated by collaborations and partnerships, as seen in this textbook in which several chapters present details of what is being done in the developing as well as the developed world.

Developments in digital communication technology, particularly the modern mobile telephone, can provide a means of giving immediate advice and instruction to health care workers in remote areas. The spread of knowledge and skills in this way has huge potential to complement this textbook in reducing the inequities of global health care.

## References

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