

THE OBSTETRICIAN CONFRONTS POSTPARTUM HEMORRHAGE

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INTRODUCTION

Postpartum hemorrhage has been recognized as a major cause of maternal death for as long as physicians have studied and written about childbirth. Until the 20th century, however, little was possible in the way of effective treatment, and, as is apparent in many of the chapters of this book, postpartum hemorrhage is still a frequent cause of death in many parts of the world. Even in the Western world, significant numbers of deaths and morbidity from postpartum hemorrhage continue to plague obstetricians, despite considerable advances in medical care in the last half-century.

During the author's career in Obstetrics which has spanned almost 40 years, one of the most striking changes has been the one whereby the individual obstetrician no longer has to deal with the problem of postpartum hemorrhage 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 a major postpartum hemorrhage can involve 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, and 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. It is evident that there was no real improvement in deaths from sepsis during this period, in contrast to a relative improvement in the 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 can be seen in Table 2, amounted to 3% in the period of 1838–1860. This appalling figure improved considerably during the latter part of the 19th century, however, following the introduction of Semmelweis' observations and teachings on hygiene and antisepsis in 1861.

Francis Ramsbotham, the first Lecturer and Obstetric Physician to The London Hospital, published 'The Principles and Practice of Obstetric Medicine and Surgery in reference to the Process of Parturition' in 1841, and provided some poignant case reports, revealing what the practice of Obstetrics was like at that time. The case of a rich patient in the City of London,

Table 1 Mortality in childbirth in England and Wales 1847–1901 (a period of 55 years), in General Lying-in Hospital, London

Year	Registered births of children born alive	Deaths			Death rate to 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
1848	563 059	3445	1365	2080	6.12	2.42	3.70
1849	578 159	3339	1165	2174	5.78	2.02	3.76
1850	593 422	3252	1113	2139	5.48	1.88	3.60
1851	615 865	3290	1009	2281	5.34	1.64	3.70
1852	624 012	3247	972	2275	5.20	1.56	3.64
1853	612 391	3060	792	2268	5.00	1.30	3.70
1854	634 405	3009	954	2055	4.74	1.50	3.24
1855	635 043	2979	1079	1900	4.69	1.70	2.99
1856	657 453	2888	1067	1821	4.39	1.62	2.77
1857	663 071	2787	836	1951	4.20	1.26	2.94
1858	655 481	3131	1068	2063	4.78	1.63	3.15
1859	689 881	3496	1238	2258	5.07	1.79	3.28
1860	684 048	3173	987	2186	4.64	1.44	3.20
1861	696 406	2995	886	2109	4.30	1.27	3.03
1862	712 684	3077	940	2237	4.32	1.32	3.00
1863	727 417	3588	1155	2433	4.93	1.59	3.34
1864	740 275	4016	1484	2532	5.43	2.00	3.43
1865	748 069	3823	1333	2490	5.11	1.78	3.33
1866	753 870	3682	1197	2485	4.88	1.59	3.29
1867	768 349	3412	1066	2346	4.44	1.39	3.05
1868	786 858	3503	1196	2307	4.45	1.52	2.91
1869	773 381	3283	1181	2102	4.24	1.53	2.71
1870	792 787	3875	1492	2383	4.89	1.88	3.01
1871	797 428	3935	1464	2471	4.98	1.81	3.09
1872	825 907	3803	1400	2403	4.60	1.70	2.90
1873	829 778	4115	1740	2375	4.96	2.10	2.86
1874	854 956	5927	3108	2819	6.93	3.63	3.30
1875	850 607	5064	2504	2560	5.95	2.94	3.01
1876	887 968	4142	1746	2396	4.66	1.97	2.69
1877	888 200	3443	1444	1999	3.88	1.63	2.25
1878	891 906	3300	1415	1885	3.70	1.59	2.11
1879	880 359	3340	1464	1876	3.79	1.66	2.13
1880	881 643	3492	1659	1833	3.94	1.88	2.08
1881	883 642	4227	2287	1940	4.78	2.58	2.20
1882	889 014	4524	2564	1960	5.09	2.89	2.20
1883	890 722	4508	2616	1892	5.06	2.94	2.12
1884	906 750	4647	2468	1879	4.79	2.72	2.07
1885	874 970	4449	2420	2029	4.98	2.71	2.27
1886	903 866	3877	2078	1799	4.72	2.39	1.99
1887	886 331	4160	2450	1710	4.69	2.80	1.90
1888	879 868	4160	2386	1774	4.73	2.49	2.01
1889	885 944	3585	1852	1733	4.05	2.09	1.95
1890	869 937	4255	1956	2299	4.89	2.24	2.62
1891	914 157	4787	1973	2814	5.24	2.15	3.06

continued

POSTPARTUM HEMORRHAGE

Table 1 *Continued*

Year	Registered births of children born alive	Deaths			Death rate to 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
1892	897 957	5194	2356	2838	5.78	2.62	3.16
1893	914 542	5950	3023	2927	6.51	3.30	3.19
1894	890 289	4775	2167	2608	5.36	2.43	2.92
1895	922 291	4219	1849	2370	4.57	2.00	2.56
1896	915 309	4561	2053	2508	4.98	2.24	2.74
1897	921 693	4250	1836	2414	4.61	1.99	2.62
1898	923 265	4074	1707	2367	4.41	1.84	2.56
1899	928 646	4326	1908	2418	4.66	2.05	2.63
1900	927 062	4454	1941	2514	4.81	2.09	2.71
1901	927 807	4394	2079	2315	4.73	2.24	2.49

Table 2 Number of deliveries, deaths and death rates during different time periods in the General Lying-in Hospital, London

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 57.875 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

described below, illustrates how little could really be done for intra- and postpartum hemorrhage.

‘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 neighbouring 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 haemorrhage 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 tumour 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 haemorrhage, 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 generation. Nowhere is the famous dedication in the frontispiece more relevant than in relation to postpartum hemorrhage:

'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, we no longer perform our tasks in isolation; we practice in hospitals which, in the majority of instances, are well or relatively well equipped, are surrounded by midwives, junior or senior colleagues, and know that various other specialists are standing by in support. Nevertheless, in dealing with postpartum hemorrhage, there comes a moment when our decisions and actions (or lack thereof) are going to 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 will come a time when the only the attending obstetrician, using his or her best and most considered judgements, 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 of postpartum hemorrhage 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 pelt. 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 hemorrhages 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 may still be faced with hard decisions. Sometimes, the presence and involvement of a large team lead 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 numerous times when the obstetrician has to take command and make rapid or difficult decisions. In a lengthy career, one may be faced with a situation that is unique and has not been met with before. A few such cases which have faced the author are now discussed.

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, upon further exploration, it became obvious that the source of the intra-abdominal hemorrhage had been a ruptured liver. A general surgeon was called, who was able to secure hemostasis with several large hemostatic liver sutures, and the patient made a slow recovery. During the postoperative period, however, it became apparent that she also had HELPP syndrome. A stormy recovery ensued, but a year later the patient was pregnant again and delivered a healthy baby.

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 caecum 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 ileocolic 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.

On yet another occasion, the author was called in at 3 a.m. 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.

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 assumed that the source of bleeding could be a splenic artery aneurysm accident, and a four-quarter exploration of the abdomen carried out. 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 stitch, 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 last 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.

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, the first ever to discuss the topic of postpartum hemorrhage in a comprehensive manner, 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 postpartum hemorrhage are not confined to one country or to one region. They are indeed world-wide, 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.

Further reading

- Donald I. *Practical Obstetric Problems*. London: Lloyd Luke Ltd, 1969
- Williams W. *Deaths in Childbed*. London: H. K. Lewis, 1904
- Ramsbotham F. *The Principles & Practice of Obstetric Medicine & Surgery in Reference to the Process of Parturition*. London: Churchill, 1941