PERINATAL LESSONS FROM THE PAST

Dr Alfred Velpeau (1795–1867) of Tours: the umbilical cord and birth asphyxia

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The son of a village farrier near Tours, Velpeau rose from humble beginnings to become by dint of intelligence, hard work, and determination the leading surgeon of his day in Paris. As professor of clinical surgery in the university he was an admired and respected teacher. His writings covered most aspects of medicine, surgery, and obstetrics.

Alfred-Armand-Louis-Marie Velpeau was born on 18 May 1795 in the little Touraine village of Bréches where his father was a farrier and “veterinary-artist”. As a young lad, Alfred was taught by the village priest to serve at Latin mass and how to write in French. He was expected to follow in his father’s footsteps. However, becoming interested in medicine, he bought two medical texts with money raised from the sale of chestnuts collected while minding his father’s cattle. A chance event changed his life. In an attempt to dispel the sadness of a depressed young girl, he only succeeded in poisoning her with hellebore. The local physician, Dr Bodin, was called. While treating her, he became so impressed by Velpeau’s knowledge and intelligence that he introduced him to a neighbouring member of the aristocracy, M Ducan, who then permitted Alfred to join lessons given by the tutor of his children. Within a year, Alfred had made such progress that his two benefactors then introduced him to Vincent Gourand, surgeon at the hospital in Tours, who in turn passed him on to Pierre-Fidele Bretonneau, the newly appointed head doctor of the hospital. The year was 1816 and Velpeau was 21 years old.^{1 2}

Bretonneau was one of the outstanding physicians of his day in France, contributing important advances in the understanding and treatment of diphtheria, typhoid, and rickets. He too quickly recognised the exceptional talent of his young assistant, and for the next four years treated him like a son, training him in clinical medicine and pathology. On occasion this involved body snatching from cemeteries in order to further their research. Years later Velpeau wrote: “Here we are every night at 2.00 am with ladders, climbing walls as criminals. This way, we obtained 36 necropsies in a few months. People guessed about our profanities, and twice I was fired on by inhabitants. I still have some lead in certain places ...”

By 1819 Velpeau was “officier de santé” at the hospital. But Bretonneau was keen that he study to become a doctor. So on 1 April 1820, at the age

of 25, he took a coach to Paris and with the help of Jules Cloquet (a friend of Bretonneau’s) obtained a position in the Saint Louis Hospital. There he gained both the anatomy and physiology prizes, while also earning a small income teaching junior medical students. At the same time he was educating himself reading Latin and French literature. During this period he lived in a garret in the Hôtel de l’Abeille at a cost of 7 francs a month, and, because he could not afford the board, existed on scraps bought illegally from hard up soldiers in the nearby barracks.

In 1823 Velpeau qualified and was appointed “agrégé de médecine” with honours, writing his thesis in Latin under the direction of Laennec on intermittent and chronic fevers. It was based on studies made with Bretonneau in Tours. Indeed his old chief often referred to Velpeau as “the Saint John of my disciples” for he (and later Armand Trousseau) brought much of Bretonneau’s unpublished work to the attention of the profession. Thus, at the age of 29, Velpeau came to be appointed to the junior surgical staff of various hospitals: Saint Antoine, La Pitié, and La Charité. In 1828 he passed the “Chirurgical”, a higher degree in surgery, and was appointed

Figure 1 Alfred Velpeau (1795–1867) from a picture painted by Peyen-Perris in 1864.

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surgeon to La Pitié. Five years later at the age of 38, he succeeded Boyer in the university chair of clinical surgery, a post he then held for the next 33 years (fig 1). Immediately he took charge of the external clinical ward of La Charité and wrote to his old chief, Bretonneau: "I am nominated, dear master; my joy cannot be described, my heart has never experienced such feelings before. All my ideas are confounded and everything disrupted in my soul ... Tomorrow the calm will allow me to write with more detail. Adieu. I send a thousand kisses."

Throughout his life, Velpeau's industry was enormous. It is said that his published works included 340 titles and 10 000 pages. There were texts on surgical anatomy (1825), obstetrics (1830), operative medicine (1832), embryology (1833), and diseases of the uterus (1854) and breast (1854). Velpeau's "hernia", "canal", "deformity", and a "pressure bandage" for the treatment of phlebitis and burns are among the items linked with his name that have come down to us. But it is with Velpeau's interest in obstetrics and gynaecology that we are primarily concerned in this short account. Among his many contributions in this field were observations on hydatidiform mole, uterine retroversion, caesarean section, the treatment of urinary fistulae, hyperplastic fibrocystic disease of the breast, and contraction of the nipple as a sign of cancer. In 1830 he published *Traité élémentaire de l'art des accouchements*, which was translated into English by Charles Meigs of Philadelphia the following year.³ It is from this text that the following extracts on birth asphyxia and the management of the umbilical cord are taken:

Ligating the umbilical cord³

"... if, as was done by Vesalius, the belly of an animal at full term of gestation be opened, the pulsations of the cord are seen to continue as long as the foetus continues to live without respiring, and, on the contrary, to cease as soon as the air enters freely into the lungs. Béclard has seen the same thing in a dog. I once received a human foetus, at the sixth month of pregnancy, enclosed within its membranes. The umbilical arteries continued to beat strongly as long as the membranes were unruptured; but they fell into inertia as soon as the lungs and chest, upon coming into contact with the air, attempted to perform some respiratory movements. And do we not every day see the blood flow or stop spontaneously in the same child, according as the respiration is free or embarrassed?

Whatever may be the fate of the explanation, it is not the less true that, if the cord were left to itself without any ligature, it would not expose the foetus to any haemorrhage, or any accident, even although it should be cut off clean and not contused or torn ... (Many colleagues) have discarded it (the ligature) without any inconvenience. Hancock, who disputes the necessity of ligating the cord, even attributes to it tetanus of the new-born child. However, as the contrary may happen; as a mere compression of the chest, or an embarrassed state of the function of any organ suffices to disorder the general circulation, and enable the blood again to pass through the umbilical ring; as cases are reported of children who have died from bleeding in consequence of the cord being not well secured; and lastly, as there is no danger occasioned by the application of a ligature, as it presents no difficulty, we are not authorised to dispense with it; we should even be culpable were we to neglect it ... The ancients were, moreover, so convinced of the utility of this ligature, that the midwives were called "cord-cutters" among the Greeks; and Aristotle considered their ability to

tie the cord as their highest qualification ... Besides this ligature, some practitioners apply one to the placental end of the cord, to prevent, as they say, any haemorrhage from taking place from the woman. But what I have said concerning the utero-placental vascular system proves that this is an unnecessary precaution. It can be of no use except in twin cases, and even then, to make it necessary the vessels of one placenta ought to communicate directly with those of the other, as appears to have been the case in two instances met with by M. Mancel, but which must be a very rare occurrence ... White, who dislikes the ligature, pretends that, when left off, the delivery of the afterbirth is hastened in consequence of the escape of blood from the placenta and Bodin says also the same thing."

On white asphyxia³

"... sometimes the foetus (at birth) neither cries nor respire; its skin is pale; the circulation is languid, the heart scarcely beats; and but for the heat which remains and the obscure motion of the umbilical arteries and heart, the death of the child would be evident. This is the state which is called asphyxia of newborn children ... It is met with particularly after very prolonged delivery when the child has been turned, when it is born before full term, where there has been a flooding during labour ... the compression of the cord may also occasion it, by closing the passage for the blood in the vein ... Upon the whole, it seems to me that asphyxia of newborn children ought to be attributed to the affection suffered by the blood in the last moments of the labour, its placental modification and its having ceased to be subjected to that sort of internal respiration which, under ordinary circumstances, is kept up, until the real respiration becomes positively established ... Where there is reason to believe that the placenta still maintains a part of its natural relations with the womb, and especially where there is still some tremor, some pulsation in the cord, we may follow the advice of Levret, Smellie, Fréteau, Piet, Chaussier, etc. not to cut it too soon; but if the womb be well contracted, if the adhesions of the placenta be evidently destroyed, it would be better to separate the foetus at once from its mother ... Supposing that the secundines are either wholly expelled, or on the point of being expelled, and that there should be some pulsations in the cord, I should not object to keeping them for some time in warm wine and water, as again recommended even in our own day by many authors ..."

On blue asphyxia³

"... the child is sometimes born in quite a contrary condition; its skin is of a bluish-red or liver colour, of various degrees of intensity, especially on the face, and appears as if thickened ... The apoplectic state is met with, especially in strong children, after long and difficult labours, the application of the forceps, and pelvic labours, either spontaneous or artificial; where the child has remained for several hours under the influence of the uterine contractions after the discharge of the waters; where it has presented in a bad position; where it is too large to pass with ease through the various passages; where a loop of the cord encircles the neck, or is itself in any way compressed, and particularly where any of these accidents occur coincidentally with a previous plethoric

state. Its immediate cause is the compression or engorgement of the brain; which, however, does not prevent a want of the revivification of the blood from being an occasional cause of it ...

When a child is born in this state, we should make haste to disengage its vascular system; by acting soon where there is no effusion, the alarming symptoms may generally be soon dissipated ... The section of the cord is the first and chief remedy to be resorted to. The ligature is not to be applied until after the disappearance of every bad symptom, because the advantage of this section is that it gives free issue to the blood ... As the blood flows, the child seems to revive; the livid colour of the lips is soon replaced by a purplish or rosy hue ... the respiration soon becomes established, and in a few minutes the danger has wholly disappeared ... When the integuments have recovered their natural colour, the circulation has returned to its nature state, the respiration is no longer doubtful and the foetus cries and moves freely, the bleeding must be stopped, providing it should not have stopped of itself. After this, we proceed as if the child had been born well ..."

Velpeau was upright, tall, and thin with a prominent forehead (fig 1). In 1832 he married a charming and educated woman. Towards the end of his life he bought a country house in Antony, South of Paris, though he only saw his family—his daughter, his son-in-law, the Count Thoinnet de la Turnaliere, and his grandchildren—at weekends. He was immensely industrious, working all hours and rarely taking holidays. His was the greatest consulting practice in the city of Paris. He was always punctual for his classes and excluded students who were regularly late without good reason. But he was well loved for the consideration he showed to his young colleagues. His ward rounds always attracted a large audience which appreciated his encyclopaedic knowledge and clear logical teaching. A methodical and careful practitioner, he sought always to distinguish between fact and opinion. Precise diagnosis and prognosis was his prime aim. As he said: "Medicine is but one subject, Sirs, get

used to this thought. Learn medicine if you wish to perform successful surgery; to be a good surgeon you have to be a good doctor." While he may not have been in the front rank as a scientific surgeon, he was thoroughly reliable and, as Oliver Wendell Holmes was to say of him: "a good sound head over a pair of wooden shoes is a good deal better than a wooden head belonging to an owner who cases his feet in calf-skin".

Velpeau was elected to the Academy of Medicine in 1832, and to the prestigious Academy of Science in 1843. That year he also succeeded to Baron Larrey's post after his death. It seems probable that he would have been promoted to Baron Velpeau in 1848 but for the revolution which drove the French royal family out of France. In 1860, honoured and famous he visited Bréches where he had been born. The village church was falling into disrepair, and he gave a substantial sum of money to renovate it. His generosity is still remembered in a stained glass window there. In it he is represented in his professional dress with the inscription: "Homage de reconnaissance au Docteur Velpeau, Fondateur de cette Eglise".

In 1867 Velpeau caught flu but insisted on continuing to work. A few days after performing an amputation, he died on 24 August at the age of 72. His funeral at Saint-Thomas d'Aquin and at the cemetery of Montparnasse was magnificent, the crowd swelled by the participants of an international medical congress in Paris. It was a fitting end to the life of a man who, from humble origins, had by his own endeavours risen to the front rank of his profession as one of the leading surgeons of the century. On his death bed he is said to have murmured: "Il ne faut pas être paresseux; travaillons toujours" (One must not be idle; we should always work).

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