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CAESAREAN BIRTH

Only 100 years ago, in 1890, the first successful caesarean birth, with survival of both mother and baby, was reported in Ireland. During the following 20 years, the operation was performed nine times in Belfast. The earliest title for the operation was the caesarean birth. The term "caesarean section" was first used by the French obstetrician Guillemeau in 1598. The operation was basically to deliver live babies from dead mothers but more often to deliver dead babies from dead mothers. There has been much discussion about the origin of the name for the operation, and three different explanations are offered.

It has been stated that Julius Caesar had been delivered by this method. This is most unlikely as his mother, Aurelia, was still alive at the time of his invasion of Britain. As the knowledge of anatomy was so poor at that time, it is inconceivable that any woman could have recovered from such crude major surgery. In 715 BC, Numa Pompilius, King of Rome, codified the Roman laws. It was forbidden to bury a dead pregnant woman before the fetus was excised. The child, if alive, was known as a "caeson", but if dead, it was buried separately from its mother. This law was the Lex Regis. With the development of the Roman Empire under the Caesars this law became known as the Lex Caesaris. A more acceptable explanation is that the name is simply derived from the Latin verb "caedere"—to cut. Guillemeau may have complicated matters as "section" is also derived from the Latin verb "seco" (to cut). As both words mean to cut, a better name for the operation would be the original—caesarean birth.

HISTORY

The history of the development of the operation can readily be divided into four eras.

Pre-history— 1500 AD

The ancient records are so meagre that there is little value in assessing early midwifery practice. A woman would often give birth to her baby out of doors and



unaided. It is not surprising that the first caesarean births were regarded as supernatural. Aesculapius, the God of Physic, was delivered by his father Apollo from the side of his dead mother Corelia. Bacchus, the God of Wine, was delivered in a similar manner by Jupiter from his dead mother.

Many of the old religions had very definite rules about the operation. Two of the oldest Rabbinical commentaries on the Book of Moses, the Mischnagoth and the Talmud, written about 150 BC, include references to the operation. In the Mischnagoth it is written, "it is not necessary for the women to observe the days of the purification after the removal of the child through the parities of the abdomen. Such children were known as 'jotze dotin', translated as 'go out of the body wall'". This statement suggests that not only was the operation performed on living women but that many babies survived. The Talmud states "in the case of twins, neither the first brought into the world by the cut in the abdomen nor the second can receive the right of primogeniture—either as regards the office of priest or successor to property". On the other hand, the

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followers of Islam were opposed to the operation and believed that a child delivered by this method was the offspring of the devil. The Christian Church, being concerned with saving both lives and souls, favoured the operation.

In Ireland in the year 200 BC there is the record of such an operation. When Connor McNessa, King of Ulster, was deserted by his wife Queen Maeve of Connaught, he asked her father for the hand of another daughter, Eithne, in marriage. Unfortunately, near term during her first pregnancy, Eithne fell into the river Inny. When taken from the water it was obvious that she was dead so an immediate postmortem operation was performed. A son, born alive, was named Furbaidh which is derived from the Gaelic word "Urbaidh" (to cut). Details of the operation are recorded in the Book of Lecan which is preserved in the Royal Academy in Dublin.

Hippocrates, the great Greek physician born about 460 BC, had a sound knowledge of anatomy. He was the first doctor to attempt to improve the art of obstetrics and he wrote about disproportion in labour and antepartum haemorrhage. His teachings influenced many other physicians. However, from the earliest times, the practical side of midwifery was entirely in the hands of the midwives, and management of the woman in labour was regarded as outside the province of the physician, except when summoned in very exceptional circumstances. The midwives were not the skilled women of today. They were uneducated and usually the older members of the woman's family. There was no formal training and knowledge was based on experience, often obtained at the expense of the lives of their unfortunate patients. In early Christian times some physicians, for example Soranus Swanus in Rome, wrote textbooks of instructions for midwives. But from the second to the sixteenth century, medicine suffered a severe setback and the teachings of Hippocrates, Soranus and others were forgotten. Rational medicine gave way to superstition and disease was regarded as possession by the devil. Practical midwifery remained in the hands of the midwives and physicians gave up its practice altogether.

1500-1876 AD

This era may be regarded as the time of re-introduction of doctors to midwifery, or the age of the obstetric physician. It has been suggested that the first successful operation was done by the horns of a rampant bull and not by man. Jacob Nufer, a Swiss sow-gelder, has been given credit for performing the first successful operation in modern times—in the year 1500—when both mother and child survived. His

wife had been in labour for several days and was unable to deliver the baby. Thirteen midwives and a lithotomist tried on different occasions to assist her, but of no avail. The local mayor permitted Nufer to perform the operation, which he did with a razor. It is reported that this woman subsequently had five vaginal deliveries, but details of the operation were not recorded until 1582. Many modern historians no longer accept this claim as they feel that the news of such a feat would have been widely reported before that time.

Disagreements—both verbal and physical—developed between doctors who wished to practise midwifery and midwives who wished to have full control of the patient. Prudery at that time often forced doctors to perform deliveries under cover of a sheet. In Hamburg, in the year 1552, a Dr Werth attended a patient while disguised as a woman, but he was recognised and then burnt to death.

Likewise, in England, the details of the first caesarean birth did not appear in the medical press but in the proceedings of a court. The report read as follows: "Doctor John Bullawanger of Huntingdon was indicted before the Justices of Assize for the Norfolk Circuit. The charge was that he, who claimed to be a physician and surgeon, took upon himself to operate on Alice Redborne who was labouring under diverse infirmities on or about the 17th June 1573. He made an incision in the belly and the womb and drew out a child. The patient died on the 28th June 1573. The doctor was found guilty, but as he was thought to be the first in the British Isles to perform the operation, he was pardoned." The first authenticated operation reported in a medical journal was performed by Dr Trautmann of Wittenberg on 21st April 1610. Present at the birth were a professor, an archdeacon, two midwives and seven honourable women. The baby survived but the patient died on the twenty-fifth postoperative day.

In the British Isles only a few caesarean births took place in the next 100 years. In Edinburgh, on 29th June 1737, a Mr Smith performed the caesarean operation in the presence of seven medical gentlemen. Other medical colleagues who refused to agree to the operation did not attend. The indication for the operation was "prolonged labour of seven days due to mollitus ossium." The child was stillborn and the mother died 18 hours after surgery.

The first caesarean birth in England in which the patient survived was performed by Dr James Barber of Blackburn in 1793. The patient was a Jane Foster of Chorley. In Ireland we hold the record where both mother and baby survived the operation. This was reported in the medical press by Surgeon Duncan

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Stewart of Dungannon and confirmed by a letter from Dr Gabriel King of Armagh. Stewart wrote as follows: “Alice O’Neill, aged about 35 years, wife to a poor farmer near Charlemont, Co Armagh, and mother to several children, in January 1738 was taken in labour, but could not be delivered by several women who tried it. She remained in this way for twelve days. Mary Donnelly, an illiterate woman, but eminent among the common people for extracting dead births, tried to deliver her in the common way, but not succeeding, performed the Caesarean operation by cutting with a razor, first the containing parts of the abdomen and then the uterus, at the aperture of which she took out the child and the secundies. She held the lips of the wound together with her hands till one went a mile and returned with silk and common needles that tailors use. With these, she joined the edges in the manner employed for hare lip. In twenty-seven days the patient could walk a mile”. Stewart reported that he used to meet her regularly in the town which was six miles from her home.

There was marked opposition to this procedure in the British Isles because of the appalling maternal morbidity and mortality. There was, of course, only one indication for the operation—disproportion in labour. This opposition was led by Fielding Ould who wrote in his *Treatise of Midwifery* (1742) “I have taken upon myself to absolutely explode the caesarean operation as repugnant—not only to all the Rules of Theory and Practice but even Humanity itself”. Ould became the second Master of the Rotunda Hospital in Dublin. He was knighted for his services to the Countess of Mornington, whose family lived in Belvoir Park House. Belfast.

In 1783, Dr Dease, also from Dublin, condemned the operation. He wrote, “The operation seems in general only to have been performed by ignorant and rash men who had no reputation to lose and were anxious to establish one, though their fellow creatures lives should be the price”. He did approve of the postmortem operation. One year later he gave up the practice of midwifery, became a founder member of the Royal College of Surgeons in Ireland and its first Treasurer.

In England, Smellie and Burton favoured the operation. Hull of Manchester, who was the first doctor in England to perform the operation twice on the same patient, favoured it, while his colleague Simmonds opposed it. Simmonds tried to get all doctors to sign an agreement never to perform the operation. He suggested that the high mortality in England was due to the poor climate. British physicians considered the operation only in patients with rickets in whom the antero-posterior diameter was

less than 2¾ inches. They claimed that a good man could always deliver the baby vaginally. The case reported by Dr Osborne in 1776 illustrates this practice. The patient was only 3 feet 6 inches tall. The antero-posterior diameter of the left half of the pelvis was ¾ inch and of the right side 1¼ inches. After the patient had been in labour for 72 hours Osborne managed to perforate the skull. After 120 hours he succeeded in getting a crochet into the foramen magnum and delivered the baby in another 3 hours. He reported that the patient displayed great fortitude throughout!

During the nineteenth century the operation was performed in many countries throughout the world. Dr Felkin in 1879 witnessed an interesting operation in Uganda. The native operator prepared the patient’s abdomen with alcohol made from bananas, gave some of it to her orally as a form of analgesia, and then washed his hands in it as a form of disinfectant. Even at this time, British doctors were still opposed to the operation. The alternatives were craniotomy with or without embryotomy, high forceps, the blades being applied above the pelvic brim, or symphysiotomy, by which the symphysis was divided to enlarge the pelvic cavity. Doctors had no means of knowing whether the baby was alive or dead—unfortunately it was usually dead. The fetal heart was first heard by the Vicomte de Kergardac in 1819. The fetal stethoscope was introduced into British obstetrics by the staff of the Rotunda Hospital, who in turn had been taught by J C Ferguson, first President of the Ulster Medical Society. In 1855, Simpson pointed out that the fetus, if alive, felt pain during craniotomy. Despite these developments doctors still favoured craniotomy because of the lower maternal mortality (Table I).

Year	Method	Mortality
1866	Craniotomy	20%
1866	Caesarean section	89%
1876	Caesarean section	84%

What did the caesarean birth entail?

Throughout the centuries, artists have depicted the birth of Eve from the right side of Adam’s abdomen, lateral to the rectus muscle. This technique protected the woman’s bladder. In 1606, Shakespeare, in *Macbeth*, described the birth of Macduff who “from his mother’s womb was untimely ripped”. By the late nineteenth century there had been little change in the operative technique. The patient may have been

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given laudanum or alcohol as a form of anaesthesia, and she was held in the semi - recumbent position by four strong assistants. The abdominal incision was made lateral to the right rectus but it might have been vertical, oblique or semi-lunar. Some doctors favoured a transverse incision below the rib cage in order to expose the fundus of the uterus. Rarely was the midline incision performed. The uterine incision was made in front, at the side, in the fundus or even in the posterior wall. Again, the incision might be vertical, transverse or oblique. The incision was never sutured. The placenta might be removed manually or allowed to extrude vaginally later. The abdominal wall was closed by three or four sutures. Death was the rule—either due to primary postpartum haemorrhage or peritonitis initiated by infected lochia.

In Ireland during the nineteenth century a few caesarean births took place. In 1816, Charles Hawkes Todd was the first doctor to perform the operation. This was carried out in Dublin on a Mrs McClorey from Loughbrickland, Co Down. The baby survived but the patient died on the fourth postoperative day. On 29th September 1829, Dr McKibben performed the operation in the Belfast Lying-In Hospital. The patient had been in labour for 48 hours: there was a bony exostosis in the hollow of the sacrum so that the antero-posterior diameter was only 1½ inches. The operation took 20 minutes and there was no anaesthesia, the baby was stillborn and the mother died 17 hours later. On 18th May 1849, Dr John Campbell, medical officer to the Lisburn Union Infirmary performed the operation on a Mrs Rodgers, aged 40 years, who suffered from osteomalacia. The operation was performed in her home—described as a wretched cabin near Dromara, Co Down. Chloroform anaesthesia was used. The assistant was Dr Musgrave (Junior), whose family have been benefactors of both the City of Belfast and the Royal Victoria Hospital. It is noteworthy that Simpson had first used chloroform anaesthesia in 1847.

In far away South Africa a young Irish doctor also made history. The doctor, Surgeon James Barry of the Army Medical Service, was described as “the most skilful of physicians”. In reality she was probably the illegitimate daughter of Margaret Bulkely and James Barry, both being natives of Co Kerry. Her life story is fascinating and so far has provided material for several biographies, at least four novels, and two plays. Doctor Barry delivered Mrs Munnik of Cape Town of a male child by the caesarean operation on 25th July 1826. The child was baptised James Barry Munnik. A descendant of that child, James Barry Munnik Hertzog, became one of South Africa's most famous Prime Ministers. Dr Barry eventually became

Inspector General of the Army Medical Services. Only after death was her true sex discovered, but her headstone in Kensal Green Cemetery still recorded her as male.

1876-1949

During this time most improvements took place in the operative technique—the era of the obstetric surgeon. Doctors searched desperately for methods to reduce the mortality associated with the operation. In 1880, Radford of Manchester found records of only 131 caesarean births in the previous 140 years, with a maternal mortality of over 83%. In Italy in 1876, Porro reported his operation. He performed the caesarean operation, then placed a “cintrat”—really a snare—round the uterus and performed a subtotal hysterectomy and bilateral salpingo-oophorectomy. The cervical stump was brought out through the lower end of the abdominal incision. The snare, together with the abdominal sutures, was removed on the fourth day. This operation stopped primary haemorrhage and usually prevented sepsis. Soon the maternal mortality was below 30%.

This operation, though previously suggested by others, had never previously been performed. Porro published his case report in a 62-page article which included photographs of himself, the patient and the specimen! As the operation was mutilating and restricted family size, search for better techniques continued.

In 1769, Lebas sutured the uterine incision. The patient survived but the technique was rejected by the pundits of that time. The materials which became available were waxed silk, silver wire and, later, carbolised catgut which, in theory, was best but because of its variability in strength was worst in practice. The use of sutures in the uterus abolished haemorrhage, reduced sepsis and preserved the uterus. Once this was seen to be an obvious progress, numerous operations were described.

Sanger in 1881 described his procedure, which is the forerunner of the present classical operation. There have been many modifications. Sanger's contribution was that the uterine muscle was sutured in one layer and then the peritoneum was sewn in a continuous separate layer over it. However, he was not the first to perform his own operation! Dr Leopold performed the operation in 1882, while Sanger did not do so until 1884. This operation was widely adopted in Britain. Also in 1881, Kehrer incised the lower uterine segment transversely and sutured it after delivery of the child and placenta. Many others had performed the operation in the lower segment with disastrous results, but Kehrer's contribution was

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the closure of the incision. This is the present day lower segment operation, although this advance was not appreciated for many years.

The present century opened with a maternal mortality following caesarean births of between 5% and 10%. This was due to better asepsis, antiseptics and careful surgical technique using good suture material. However, doctors realised that there was a high mortality following surgery if the patient had been a long time in labour. It is only 100 years ago since the first report of a successful caesarean birth performed by a doctor in Ireland in which both mother and baby survived. Sir Arthur Macan had never seen the operation but read Sanger's article before deciding on his technique. The patient was only 104.0 cm tall, and the fetal head was not engaged, so an elective "classical" operation was performed.

In 1911, Routh published a detailed list of 1,282 caesarean births in Britain between 1890 and 1910. Of these, 53 were performed in Ireland, with a reported maternal mortality of 13.2%. Forty of the births took place in Dublin, four in Cork and nine in Belfast.

The Belfast doctors were Sir Robert Johnstone of the Belfast Lying-In Hospital, Sir Alexander Dempsey of the Mater Hospital and Sir John Campbell of the Samaritan Hospital. In the same year, Munro Kerr in Britain adopted the lower segment operation. During the twenties others experimented with it, in the thirties there was considerable support for its use, and in the forties there was almost universal acknowledgement of its superiority over the classical operation. Finally, at the twelfth Congress of Obstetrics and Gynaecology held in London in 1949, the use of this technique was vindicated. Many papers were presented to support this claim. Munro Kerr, long since retired, was invited to speak from the platform. He thanked everyone and ended by raising his hands and acclaimed "Alleluia. The strife is o'er, the battle is done!". The safety of the operation had been recognised, but that safety may have led to the problems of the present time.

1949-1989

This phase may be regarded as a time for widening the scope of the operation—the era of the obstetric specialist. The National Health Service began in 1948. In 1949, home confinement was still the norm and there were no specialist maternity units outside Belfast. Maternal and neonatal mortality were high, and caesarean births were rare. The obstetric policy was conservative and the motto was "masterly inactivity".

In the early 1950's, specialist units were opened in many large country towns, each being staffed by a consultant surgeon, a physician and an obstetrician. Soon to be added were consultant anaesthetists and clinical pathologists, but there were no junior staff other than pre - registration housemen. Pregnant women gradually chose to have their babies in hospital. Operative obstetrics increased and the motto became "active intervention". How did this come about?

ACTIVE INTERVENTION

The easier induction of labour

The long established but hated, oil, bath and enema technique was replaced by the Pitocin-Syntocinon drip. As this was a better method of induction, more labours were induced. Unfortunately, there was also a high failure rate because of poor patient selection, which necessitated delivery by the caesarean operation. In one Belfast hospital in 1980 this operation was performed in 25% of primigravidae whose labours had been induced. (Dornan, personal communication). Newer induction agents, stricter selection of patients and a lower induction rate have reduced the number of caesarean births from this cause.

The change in the definition of prolonged labour and the introduction of the term "failure to progress"

In 1964, the definition of prolonged labour was reduced from over 48 hours to over 12 hours. Since that time it has been taught that, in normal labour, the cervix in a primigravid patient dilates at 1 cm per hour. The partogram, devised by Philpott is a visual record of labour and is more easily studied than handwritten notes. When the cervix does not dilate at the normal rate, Syntocinon augmentation is instituted. If progress still remains slow, operative delivery is recommended because of failure to progress.

The development of electronic fetal monitoring

This technique was introduced in the late 1950's. Two electrodes attached to the maternal abdomen record the fetal heart rate and the strength of the uterine contractions. The fetal scalp electrode is used regularly but the intrauterine pressure recorders have largely been abandoned. The tracings record normal and abnormal rates, both during and between uterine contractions. This technique, like so many others in medicine, was recommended to obstetricians as a great advance in the management of the fetus in labour, without controlled clinical trials. Now, many operative deliveries are performed for fetal distress due to presumed intrapartum anoxia on the basis of

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this electronic monitoring. The advent of this method of diagnosis of fetal distress in labour has now led to "obstetricians' distress"—because of litigation and claims of negligence based on these fetal heart rate tracings, "defensive obstetrics" has become the obstetric motto.

An example of this is the now widespread practice of delivering the breech presentation either by elective surgery or in early labour. Most patients with antepartum haemorrhage now have operative delivery instead of only those with placenta praevia. Another welcome development has been the diagnosis of intrauterine growth retardation by ultrasound scanning, and early safe delivery by surgery. Likewise, patients with severe pregnancy-induced hypertension, diabetes, or rhesus isoimmunisation, who are unsuitable for induction, are offered elective surgery—much safer than the attempts of yesteryear at induction of labour with the Drew-Smythe catheter or stomach tube!

Repeat elective operation

In the USA in 1916, Craigin recommended "once a caesar always a caesar". This directive is widely quoted but it was first stated over 80 years ago when in the USA a large percentage of uterine incisions were made in the fundus of the uterus. In 1972, Tindall in England also recommended "once a caesar repeat caesar", thus effectively abolishing the conservative English motto "once a caesar always in a specialist hospital". Tindall made this proposal because patients had no intention of having more than two or three children. In the USA, vaginal delivery following a caesarean birth is now almost a rarity because of the strict conditions laid down for the supervision of labour. Unfortunately, in both the USA and the UK, the repeat elective caesarean birth has become more acceptable to both patient and doctor.

The development of the neonatology service

The development of this specialty has had a dramatic effect on the management of patients as more and more premature and severely ill babies can now be successfully treated.

WHAT OF THE PRESENT?

The mortality due to the operation is now less than 0.08%.⁹ The rate for caesarean birth has risen in England and Wales since 1970. In the USA in 1970 the rate was similar to that in England and Wales but has increased more rapidly. (Table II). Experts predict that in 1990 the US rate will reach 28% of all deliveries and by the year 2000 will be 40%. It has been

suggested that the improvements in maternal and perinatal mortality are entirely due to the more liberal use of the caesarean operation.

TABLE II
Incidence of caesarian births in England and Wales, and in the USA

Year	England and Wales	USA
1965		4.5%
1970	4.3%	
1980		16.5%
1985	10.6%	
1986	11.3%	24.1%

In an editorial in the British Medical Journal in 1988, Lomas discussed "holding back the tide of caesareans". At the 1989 British Congress of Obstetrics and Gynaecology in London several doctors supported this view. Elstein pointed out that the increased operative rate had not reduced the incidence of cerebral palsy, which he considered was rarely due to intrapartum anoxia. Barrett in a survey of all emergency operations in one hospital, suggested that caesarean birth was unnecessary in almost 40% of patients delivered by that method. Batemann pointed out that of babies delivered by emergency caesarean operation because of fetal distress in labour, only 20% required admission to a special care baby unit.

Unless we can reduce the high operative delivery rate, much of the improvements which have been achieved by the medical and nursing professions will be swept aside by popular lay opinion and the natural childbirth enthusiasts, both groups being concerned by the high rate of intervention. The late George Gibson concluded such a lecture as this by quoting one of his teachers, Davidson, Master of the Rotunda hospital, who in 1940 was disturbed when the caesarean birth rate had risen to 1.3%. In 1988 it was 12% at the same hospital. (Darling, personal communication). May I conclude by repeating that quotation: "Is it", asked Davidson, "that some obstetricians now regard the birth canal as a makeshift exit only to be used when they are otherwise engaged?"