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L Ray Matthews[1]*, Omar Danner[1], Zellie Orr[1], Jonathan Nguyen[1], Keren Bashan-Gilzenrat[1], Diane Dennis-Griggs[1], Yusuf Ahmed[2], Kenneth Wilson[3] and Ed Childs[1]

[1]Morehouse School of Medicine, Atlanta, GA, USA
[2]Sidra Medical and Research Center, Doha, Saudi Arabia
[3]Michigan State University College of Human Medicine, East Lansing, MI

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***Corresponding author:** L. Ray Matthews, MD, FACS, Morehouse School of Medicine, Atlanta, GA, USA, E-mail: lematthews@msm.edu

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Case Report

Medical Miracle in Indianola, Mississippi: The Untold Story of Dr. Clinton Battle and the Indianola Conjoined / Matthews Siamese Twins

Abstract

Conjoined twins are very rare. The overall survival rate has been estimated to be approximately 25% to 50%. We report a case of conjoined twins delivered in Indianola, Mississippi in 1955 who made medical history. The Matthews' conjoined twins were the first in history to be separated and both survive. They were delivered in rural Mississippi at home by vaginal delivery by Dr. Clinton Battle, a 29-year-old Meharry School of Medicine graduate. The Matthews twins are now 61 years old (retired school teachers) and their 92-year-old mother, Missouri Matthews, are alive and well living in Mississippi.

Introduction

Conjoined twins, a rare phenomenon in which identical twins are joined in utero, are estimated to occur in the range of 1 in 50,000 births to 1 in 200,000 births, with a somewhat higher incidence in Southwest Asia and Africa [1]. Approximately half are stillborn, whereas a smaller percentage of couplets are born alive but have abnormalities incompatible with life [2,3]. The overall survival rate for conjoined twins has been estimated to be approximately 25% to 50% [4]. The condition has a higher female preponderance with a ratio of 3:1 [2,3].

The earliest known documented case of conjoined twins, also referred to as Siamese twins, dates back to the year 942 when a pair of conjoined twin brothers from Armenia were brought to Constantinople for medical evaluation [5]. The most famous pair of conjoined twins was Chang and Eng Bunker (1811–1874), Thai brothers born in Siam, now Thailand. They travelled with P.T. Barnum's circus for many years and were referred to as the Siamese Twins. Thus, the term "Siamese twins" came to be used synonymously for conjoined twins, due to the brothers' fame and the rarity of the condition during that time [5].

Although Siamese twins share a single common placenta, chorion and amniotic sac, these characteristics are not limited to conjoined twins. In actuality, there are some monozygotic but non-conjoined twins that also share these structures in utero [3]. Two contradicting theories have been traditionally put forth to explain the origins of conjoined twins. The older supposition is fission theory, which asserts that the fertilized egg splits partially. The second and more commonly accepted viewpoint is the fusion theory, in which a fertilized egg completely separates. However, stem cells appear to fuse with similar cells on the other twin and connect the fetuses together.

In a recent study detailing the twenty-year history at a reference center in Brazil, the authors shared the experience of one hospital regarding the surgical aspects, anatomic investigation and outcome of the management of 21 conjoined twin pairs over the past 20 years. All cases of conjoined twins who were treated during this period were reviewed. There were eight sets of ischiopagus twins, seven sets of thoracopagus twins, three sets of omphalopagus twins, two sets of thoraco-omphalo-ischiopagus twins and one set of craniopagus twins. Nine pairs (43%) of these conjoined twins could not be separated secondary to the complexity of the organs (mainly the liver and heart) that were shared by both twins; these pairs included one set of ischiopagus twins, six sets of thoracopagus twins and one set of thoraco-omphalo-ischiopagus twins. Twelve sets (57%) were separated, including seven sets of ischiopagus twins, three sets of omphalopagus twins, one set of thoracopagus twins and one set of craniopagus conjoined twins. The surgical survival rate was 66.7% [6]. In short, each set of conjoined twins is unique. An imaging strategy to accurately define anatomic fusion, vascular anomalies, and other associated abnormalities, is important for surgical planning and prognostic information [7].

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Timing of operation and separation plan should be given according to the circumstances and the nature of the organ shared in each individual set of twins [8]. Based on its organ-sharing classification system, there are 7 major types of conjoined twins, with thoracopagus (thorax) being the most common type [7]. We present the case of one of the earliest known successful separation of conjoined twin as well as report the unheralded story of Dr. Clinton Battle, the physician who delivered them on that fateful day in September 1955 [9].

Case Report

Dr. Clinton Charles Battle, a native of Indianola, Mississippi (Sunflower County) played a pivotal role in impacting the modern day era of medicine. It is indeed an honor to share in profiling this trailblazer. Dr. Battle was born in 1926 in Indianola, Mississippi located in Sunflower County, the heart of the Mississippi Delta. He finished high school by age 16, and at age 24 received his Doctor of Medicine Degree (June 5, 1950) from Meharry Medical College in Nashville, Tennessee. He interned at the Kansas City General #2 Hospital, in Kansas City, Missouri from July 1, 1950 – June 30, 1951. However, in order to fulfill his medical debt requirements and fulfill the requirements of his college scholarship, Dr. Battle had to return to his home state and practice medicine for five years [10].

It was on a rainy night, September 14, 1955, when he arrived at the home of his former high school classmate, John Matthews, Sr., where the 29-year old doctor could not have imagined the challenge that awaited him. Mrs. Missouri Matthews was about to give birth. While this was not a new experience for John and his wife, the parents of six children—Dr. Battle realized there was a dire problem. The delivery was not a single birth, but one of conjoined (Siamese) twins. Unassisted and without the use of anesthesia, Dr. Battle successfully delivered the conjoined twins vaginally at their home. However, the delivery was not without complications. One of the twins was unconscious and not breathing. Detecting a heartbeat, Dr. Battle's prompt response would result in a medical miracle.

The conjoined twins, Lillian and Linda, were rushed to Indianola's South Sunflower County Hospital, where doctors gave the unconscious twin oxygen. The girls weighing 11 pounds, 6 ½ ounces, were joined at the abdomen (omphalopagus). Three days later, the twins were transported to Memphis, Tennessee to John Gaston Hospital, where they were evaluated for possible surgical separation. The results of the physical examination revealed no abnormalities in either twin, except for the bridge of tissue which joined them from the lower body of the sternum to the umbilicus (thoraco- omphalopagus). Their development prior to operation followed the normal pattern for twins of their size. X-rays were taken after one twin was administered barium by mouth and showed that the intestine of the one herniated across the anatomical bridge into the abdominal cavity of the other. However, no visceral communication between the twins' intestinal tracts could be demonstrated.

During another radiographic study, charcoal was administered by mouth to one. It was recovered in the diaper of the one in which it had been given, but not in the other. Furthermore, intravenous indigo carmine which was administered to one was almost exclusively excreted in the urine of the same twin with only a faint trace in the diaper of the other sibling, thus indicating only a minimal vascular communication. The twins were nutritionally supported and when the twins were 5 ½ weeks old, Lillian and Linda, were surgically separated. The surgeon who performed the operation was Dr. Harwell Wilson. Born in 1908 in Lincoln, Alabama, it was his grandfather, Dr. J. Tinsley Harrison, a rural general practitioner, who greatly influenced his decision to enter the medical field. During his lifetime, Dr. Wilson received many honors and awards, civilian and military.

After the twins were released and returned home, they were taken back to the hospital several times. In 1956, Lillian and Linda were operated on a second time. From then onward, they were entirely normal in every way. Although Dr. Wilson received great recognition and accolades for performing this magnificent feat, Dr. Battle received little to no credit or meaningful recognition or credit for his contribution to this incredible medical accomplishment. Having completed his medical requirements in Mississippi circa 1959, Dr. Battle abruptly left Mississippi with his wife and children, and headed north to re-establish his medical practice [11-19].

Discussion

Conjoined twins, also referred to as Siamese twins, are very rare congenital malformations [8]. They occur in approximately one in 50,000 or so live births [1]. The majority do not survive long-term [20]. Timing of operation and separation plan should be given according to the circumstances and the nature of the organ shared in each individual set of twins [8]. Therefore, a careful imaging evaluation must be performed to detail the abdominal anatomy (particularly the liver), inferior vena cava, spleen and pancreas, to identify the number of organs and to evaluate the degree of organ sharing. The importance of a multidisciplinary approach with extensive investigations required pre-operatively in order to define areas of organ and bony conjunction, other congenital anomalies of each twin and surgical teamwork cannot be over-emphasized [12]. The timing of separation has been ideally set at between 5 and 9 months with 6 to 8 weeks of prior tissue expansion but earlier operation has frequently been required because of cardio-respiratory problems or organ failure in one of the twins. In most cases, the goal of obtaining separate, independent and intact individuals is achievable [20,21].

Siamese twins have traditionally been classified according to the type and location of their body and/or organ interconnections. Based on this classification system, there are 7 major types of conjoined twins. Such twins are classified according to the most prominent site of connection: the thorax (thoracopagus), abdomen (omphalopagus), sacrum (pygopagus), pelvis (ischiopagus), skull (craniopagus), face (cephalopagus), or back (rachipagus). The area of fusion largely determines the imaging modalities used. Thoracic conjunction is most common and requires accurate cardiac assessment [7]. In thoracopagus twins the hearts are of paramount importance

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as conjunction is usually fatal, due to their association with major congenital defects. The greater the extent of thoracic cage fusion, the greater the chance of associated severe anomaly. Ischiopagus and pygopagus conjoined twins, on the other hand, manifest an interesting array of spinal abnormalities, which present challenges, not only at the time of separation, but also in their long-term management [22]. Pygopagus conjoined twins are joined at the rump and have union of the gastrointestinal and genitourinary systems in addition to the occasional involvement of neural elements [22].

In a study of 22 conjoined twin managed from 1974 to 2006 in the Philippines, it was elucidated that emergency separations yielded dismal results due to poor patient conditions; delay in separation allowed progressive deterioration and resultant poor outcome. However, elective separation had more favorable results due to well-planned strategies, team preparedness, and better patient conditions. A multi-disciplinary approach, with parental participation, was also found to be integral in the holistic management of conjoined twins, with both radiologist and pediatric surgeons playing key roles [23]. Magnetic resonance imaging and computed tomography provide excellent anatomic and bone detail, demonstrating organ position, shared viscera, and limited vascular anatomy. Contrast material radiography allows evaluation of the gastrointestinal and urogenital tracts, and a shared liver requires assessment of anatomy, vascularization, and biliary drainage. Angiography helps define specific vascular supply, which is useful in determining the distribution of shared structures between the twins at surgery [7].

Conclusion

Improved recent survival is probably the result of the availability of more accurate imaging studies and better anesthetic and operative techniques with greater emphasis on performing immediate reconstruction whenever possible. Use of skin expanders and prosthetic mesh has facilitated wound closure. In the future, ex vivo cardiac reconstruction and autotransplantation may permit separation of twins with complicated conjoined hearts.

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