

Medical and legal aspects of Siamese twins` life

Chomicz K.^{1 A-F}, Ślifirczyk A.^{1B,CD}, Ślifirczyk M.^{1,2 B,CD}, Celiński M.^{1,2 B,CD}, Bytys M.^{3 B,CD}, Domańska D.⁴, Nikoniuk M.^{4 B,CD}, Pilecka A.^{5E,F}

1. Pope John Paul II State School of Higher Education in Biała Podlaska, Poland
2. Emergency Station SP ZOZ in Biała Podlaska, Poland
3. Police Office in Biała Podlaska, Poland
4. Independent Public Health Care in Radzyń Podlaski, Mental Health Center, Poland
5. Phd Student of Department of Integrated Medical Care, Medical University of Białystok, Poland

A- Conception and study design; **B** - Collection of data; **C** - Data analysis; **D** - Writing the paper; **E** - Review article; **F** - Approval of the final version of the article; **G** - Other (please specify)

ABSTRACT

Siamese twins have always aroused a lot of emotions in the human world. It is related to the fact that they are simply conjoined to each other. Through their unnatural structure, they challenge not only medical or ethical boundaries, but also

legal. Some even say that they pose a threat to rooted social values.

Keywords: Siamese twins, conjoined twins, history of Siamese twins, separation

DOI: 10.5604/01.3001.0012.8352

***Corresponding author:**

Katarzyna Chomicz
Pope John Paul II State School of Higher Education in Biała Podlaska
ul. Sidorska 95/97, 21-500 Biała Podlaska, Poland
Tel.: 600 781 137
e-mail: kat.chomicz@gmail.com

Received: 23.11. 2018
Accepted: 23.12.2018
Progress in Health Sciences
Vol. 8(2) 2018 pp 229-233
© Medical University of Białystok, Poland

INTRODUCTION

The Siamese twins are a very rare malformation. It manifests in pathological combinations of the parts of the body of monozygotic twins, born once every 50 000 to 100 000 births. In the temperate climate zone in which Poland is located, the Siamese twins are born once every 100,000 births [1].

In turn, the overall survival rate for that kind of twins is around 25%. This condition is more common among women rather than men, with a ratio of 3:1 [1,2].

In light of various statistics, the percentage of the birth of dead Siamese twins estimates from about 40% to 86%, whereby a significant impact of differences relate to race and region. The largest number of reports on the births of Siamese twins comes from India and Africa [3].

REVIEW

The Siamese twins which are colloquially called conjoined twins or monozygotic twins arise from one zygote which is divided sooner or later (when it concerns the embryonal mass or embryonic disc). The result is the creation of single chorion, placenta, and indusium although that is not a feature of Siamese twins [4]. Separation of the embryo occurs most often between the 3rd and the 8th day of development. Whereas, if the embryo is divided after the 14th day of pregnancy, it is essentially incomplete. In consequence, it can be talked about Siamese twins [5]. These fetuses can be joined in very different parts of the body, whereby, quite often the Siamese twins have common internal organs and born dead or unable to live independently [5]. Otherwise - the twins, which are accreted, come from a spermatium (single). This embryo divides into two different ones in the initial two weeks after fertilization, but the fetus develops incompletely, and as a consequence, the fetus develops as a "fused egg" [6].

The first recorded and the most famous conjoined twins were Eng and Chang Bunker, who were born in the province of Samut Sangkhram in the town of Meklong on the island of Siam (Thailand territory) on May 11, 1811. Their father was Chinese while his mother was half-Chinese, half-Malay. Thanks to their heritage they were called "Chinese Twins" [7].

However, according to the inhabitants of the village, their birth indicated the beginning of the end of the world, and thanks to them, this tiny village became famous. At the age of several years, the boys began to disturb the continuous presence of "themselves". The doctors decided to separate them. However, their mother did not agree to it,

fearing the death of one or both of them. To reward the boys, she taught them how they can stretch all tissues in a manner that they can stand side by side, not just face to face [8].

The year 1824 was a breakthrough for Chang and Eng. R. Hunter noticed the boys and immediately became a friend of the family. Relationship with the Bunkers family was so good that he decided to get a permission from the Siam government to take the twins out to Europe. His request was rejected. Five years later, R. Hunter and A. Coffin, once again, turned to the Siam government for permission to take the boys out - they obtained it. Therefore, they offered the mother of the twins a substantial amount in exchange for permission to take them from the country. On April 17, 1829, the brothers went to the United States of America to receive in Boston "standing ovation" from the large audience. During a long North American tour, success and fortune were decided to conquer the English market. England turned out to be so kind, and their popularity was huge, that they had the honor of performing in front of the royal family [6].

Further plans were thwarted in connection with the intention of performing in France. R. Hunter sold his shares to A. Coffin, who mistreated the boys, and the French government banned them from entering the country [6].

The rest of the European countries turned out to be much more tolerant and did not close their borders. However, the boys realized that most of the profits go to A. Coffin and in 1832 they parted company with him. They began to cooperate with P.T. Barnum, with whom they performed for the next 7 years. After a decade of wandering around the world, twenty-eight-year-old men, tired of popularity and publicity, decided to leave the show business and finally settle down [8].

They chose a small American town called Wilkesboro, North Carolina, where they bought a land and began to grow tobacco. In 1839, the US government granted them citizenship, but due to the fact that they did not know their names, they became entries as "Chang and Eng Siamese Twins", and 5 years later on they adopted the name Bunker [6].

In Wilkesboro, the brothers began to meet with Adelaide and Sarah Ann Yates - daughters of a local farmer and pastor - D. Yates. Local people could not accept the bond between the boys and the Yates ladies. In connection with numerous negative comments with regard to their relationship with the daughters of the farmer and pastor, in secret from the fiancés, they went to hospital in Philadelphia to ask the doctors for their separation. When the sisters learned of this fact, they definitively refused to allow Chang and Eng to be separated. In April 1843, the wedding of couples

took place. 32-year-old twins married the Yates sisters. Eng - Sarah Ann, and Chang - Adelaide. After 14 years of living together in four, they built separate houses for their families and they agreed to change their whereabouts every 3 days [8].

During entire marriage, Sarah Ann gave birth 6 sons and 5 daughters, in turn Adelaide had 7 daughters and 3 sons (the number of their descendants is currently estimated from around 1500 to 1800). All children were born healthy. Only the daughter and son of Chang were deaf and mute. In January 1874, Chang Bunker dies as a result of tracheal disease and bronchial branching and blood clot, while Eng almost 3 hours later for unknown reasons. They lived together for 63 years [8].

Although Chang and Eng Bunker were not the first twins in the world (probably before 1811, about 100 such couples were born), they popularized the term of "Siamese twins". Thanks to this, King of Siam withdrew the death penalty for brothers, probably because of a fight with a doctor who was trying to examine them. Other documented examples of Siamese twins are misses Kent from Biddenden, born in 1100, who were joined by their hips and uttered the famous words shortly before their death: "When we came together, we would go together"; as well as twins Millie and Christine McKoy from Columbus County, North Carolina, born in captivity in 1851 [6].

The world's first pair of Siamese twins was born in 945 AD in Armenia. In turn, the first successful operation of separation of twins was in 1689 and was carried out by the German surgeon - G. König [9].

In 1860, E.G. Saint-Hilaire and his contemporary surviving French successors developed the system for classifying and cataloging siamese twins. It calls teratology. This science distinguishes twins which are symmetrically not completely separated (diplopagus), when all organs are duplicated, and asymmetric twins, not completely separated (heteropagus), when only part of anatomical structures occurs double (core - pagus in each name comes from the Greek "παζυς" every means 'connected', 'attached') [10].

In asymmetric twins it is also possible to have disproportionately developed body parts when one of them are well developed and the second one is incompleting (parasite). A special case of such a twin is the so-called "fetus in fetu" (lat. *fetus in foeto* - fetus in the fetus) [11].

Semi-connected twins are typically classified, based on the point where their bodies are connected. The most common types are:

1. Thoraco-omphalopagus (28% of cases): two bodies are connected with each other by the chest. These twins usually share the heart,

and in many cases the liver or part of the digestive system [12];

2. Thoracopagus (35%): two bodies are connected in the upper part of chest. Each of them has a separate head, arms, legs and heart. Some of them have separate hearts, which are located on one side. Separation is very risky and quite often both twins die (There have been few cases of survival for several years through twins joined by hearts. Ruthie and Verena Cady from Rhode Island survived for 7 years. Their divided heart had only three chambers. It is the most popular);
3. Omphalopagus (20%): two bodies are connected by the lower part of the chest. Unlike thoraco-omphalopagus, the heart is never occupied, although twins usually share the liver, digestive system, diaphragm and other organs. However, they have separate hearts, heads, arms and legs. Separation usually ends successfully [13]. Ronnie and Donnie Galyon, born in 1951 are currently the only case of inseparable twins of this type in the world [14];
4. The parasitic twin (10%): the twins are connected asymmetrically. One of them is small, less formed and dependent from the larger one;
5. Craniopagus (6%): conjoined craniums but separated bodies. These twins can be conjoined to the back, front or side of the cranium, but not to the faces or base of the cranium [15].

Other less common types of conjoined twins [16]:

1. Cephalopagus: two faces on opposite sides conjoined by head. The upper part of body is conjoined, and the lower part is separated. Usually twins are unable to survive because of severe brain defects. They are also called Janus (from the name of god of two faces - Janus) or catchment-major;
2. Synecephalus: one head with single face but with four ears and separated bodies;
3. Cephalothoracopagus: bodies conjoined by heads and chests. In this type of twins there are two faces looking at opposite sides, or one face has bigger skull;
4. Xiphopagus: two bodies conjoined with the alveolar cartilage, which extends from the sternum to the xiphoid process. These twins never share important organs, except the liver. That kind of twins is the easiest to separate;
5. Ischiopagus: conjoined with lower part of body, with spines conjoined end to end at an angle of 180 degrees. These twins have four arms, two, three or four legs and one external set of genitalia.

Surgical separation of Siamese twins can be both, quite simple and extremely complicated, depending on the place of conjoined and shared organs. Most surgical operations are associated with high risk of loss of life. In many cases, operations end with the death of one or two twins, especially if they are conjoined with their heads. It makes the surgery of Siamese twins who can survive without separation, ethically questionable [17,18].

Specific case was the separation of twins: Mary and Jodie (Actually, they are called Rosie and Gracie, daughters Michaelangelo and Rita Attard) in 2000 in Manchester with the religious opposition of their parents and Archbishop of Westminster. According to the extensive justification of the sentence of the Court of Appeal [19], the problem of twins was that each girl had her own brain, lungs, heart, arms and legs, and other vital organs. They were conjoined with the area of the lower abdomen, which made it possible to carry out separating operation. The surgery killed the weaker of the twins - Mary. Her internal organs, such as the lungs and the heart, were inefficient to transfuse blood. She lived only thanks to her stronger sister - Jodie, who "circled" the oxidized blood that sustained the life of both. Nevertheless, if the separating operation were not carried out, both girls would die, as doctors predicted, within 3 to 6 months due to the fact that Jodie's heart would not survive this effort. Hospital surgeons' team was convinced that they could give Jodie the life. They could accept the parents' decision however, they could not bear the thought that Jodie would die. Therefore, the hospital decided to get permission from the court to conduct the operation. The consent was issued on September 22, 2000 by the adjudicating panel of the court of first instance, however, parents of the twins appealed to the Court of Appeal [The Supreme Court of Judicature in the Court of Appeal (Civil Division)] [20].

It is known that the appeal was rejected. Justification of the sentence accepted different arguments than those which were used by the court in first instance. Parents of twins did not appeal to the House of Commons [21].

CONCLUSION

Siamese twins have caused much controversy and discussions, primarily due to the combination of them in various atypical places. Strange structure of twins who die immediately after birth or they live "in its strange form" for a long time is, according to physicians, the result of a genetic error. Nevertheless, it should be emphasized that they are not a product of the 20th century.

REFERENCES

1. Bartel H. Embriologia. Podręcznik dla studentów. Warszawa: Wyd. Lekarskie PZWL; 2012. p.113.
2. Kaufman MH. The embriology of conjoined twins; [Internet]. Available from: http://www.ncbi.nlm.nih.gov/pub_med/152783 82. [cited 2018 Oct 26].
3. Andrzejewska E. Leczenie operacyjne bliźniąt zrosniętych (syjamskich). [W:] Czernik J. (red): Chirurgia dziecięca. Wrocław: UM Wrocław; 2008. p. 335-45 (Polish).
4. Bartel H. Embriologia. Ilustrowany podręcznik. Warszawa: Wyd. Lekarskie PZWL; 2012. p.66. (Polish).
5. Spencer R.. Theoretical and Analytical Embryology of Conjoined Twins Clin Anat. 2000;13(1):36,41.
6. Eng and Chang Bunker, The Siamese Twins, [Internet]. Available from: <http://www.cojoweb.com/siamese%20twins.html>. 2018 Oct 26.
7. Fielder L.A.: Freaks: Myths and Images of Secret Self. New York: Touchstone book; 1979. p. 215.
8. Sawday JM. Separating Conjoined Twins: Legal Reverberations of Jodie and Mary 's Predicament, Loyola of Los Angeles International and Comparative Law Review 2002; 1(1):67-8.
9. Kompanje EJO. The First Successful Separation of Conjoined Twins in 1689: Some Additions and Corrections, Twin Res. 2004 Dec;7(6):537-40.
10. Spencer R. Conjoined twins: theoretical embryologic basis; Teratology. 1992 Jun;45 (6):591-602.
11. Golus A. Bliźnięta syjamskie – fenomen biologiczny [Internet]. Available from: www.englishstory.pl/tekst/_op/sm/do/sredni/329.html (Polish) [cited 2018 Oct 26].
12. Aneja A, Rajanna D, Reddy VN, Mayilvaganan KR, Pujar P. Conjoined Twins: A Rare Case of Thoraco-Omphalopagus, J Clin Diagn Res. 2013 Jul;7(7):1471-2.
13. Osmanağaoğlu MA, Güven STA., Kart C, Özdemir Ö, Bozkava H. Thoracopagus Conjoined Twins: A Case Report; ISRN Obstet Gynecol 2011;2011:238360.
14. Meet Ronnie And Donnie: The Oldest conjoined Twins In...Available from: https://aplus.com/a/ronnie-donnie-conjoined-twins?no_monetization=true [Internet] [cited 2018 Oct 26].
14. Patil PS, Kothari P, Gupta A, Kekre G, Dikshit KV, Kamble R, Deshmukh S. Successful Separation of Omphalopagus Twins: A Case Report; J Neonatal Surg. 2016; Jan 1;5(1):5.

15. Stone JL, Goodrich T. The craniopagus malformation: classification and implications for surgical separation. *Brain* 2006;129(5): 1084-9.
16. DeRuiter C.: Conjoined twins, *The Embryo Project Encyclopedia*; [Internet]. Available from: <https://embryo.asu.edu/pages/conjoined-twins>, [cited 2018 Oct 26].
17. Siamese twin Jodie 'to go home soon' www.news.bbc.co.uk/2/hi/health/1292681. [Internet]. Available from: [cited 2018 Oct 26].
18. Case No: B1/2000/2969, [Internet]. Available from: <http://news.findlaw.com/hdocs/docs/siamesetwins/siamesetwins.pdf>. [cited 2018 Oct 26].
19. Konieczniak P. Argumenty prawne; Rozdzielenie bliźniąt syjamskich Jodie i Mary - Nowy problem jaki stworzyła natura i postęp medycyny. *Prawo i Medycyna* 2000;8:100-2 (Polish).
20. See. Paris J., Elias-Jones A. Do we murder Mary to save Jodie?" An ethical analysis of the separation of the Manchester conjoined twins. *Postgrad Med J* 2001;77:593-8.