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Joachim Oelhaf and the first public autopsy in Gdansk in 1613

A. Szarszewski[1], J. Gulczyński[2], M. Cichorek[3], K. Kuklińska[4], B. Siek[1]

[1]*Department of History and Philosophy of Medical Sciences, Medical University of Gdansk, Poland*
[2]*Department of Pathology and Neuropathology, Medical University of Gdansk, Poland*
[3]*Department of Embryology, Medical University of Gdansk, Poland*
[4]*Department of Pediatrics, Pediatric Gastroenterology, Hepatology and Nutrition, Medical University of Gdansk, Poland*

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The first both in Gdansk and in Central Europe alleged public autopsy was performed by Joachim Oelhaf in February 1613. It was an evidence for Gdansk status as one of the leading anatomical centres in Europe. The aim of the article is to present the history of teaching medicine in Gdansk in early modern era and the eminent anatomists working in Academic Gymnasium of Gdansk. The preserved report of the autopsy of a new-born child with congenital defects is analysed as one of the very first texts in pathological anatomy. The described by Oelhaf case is identified as limb-body wall complex. (Folia Morphol 2013; 72, 4: 281–284)

Key words: public autopsy, Academic Gymnasium of Gdansk, Joachim Oelhaf, foetus monstrosus, limb-body wall complex

The year 2013 celebrates the 400th anniversary of the first public autopsy in Gdansk (Danzig). This momentous event is generally regarded as the first public post-mortem examination not only in Poland but also in Central Europe. The autopsy was a seminal event that elevated Gdansk to the status of one of the leading anatomical centres in Europe and would not have been possible without the formation of the Protestant Academic Gymnasium of Gdansk in 1558.

The Gymnasium was one of the many similar schools established in Europe in the second half of the 16th century and throughout the whole of the 17th century. These schools went under different names, although most frequently they were called *gymnasium academicum* or *gymnasium illustre* and were known for their high standards of education. The Academic Gymnasium of Gdansk testified to these high standards. The school attained its distinctive status through benevolent political climate in the city, when in 1558 the Polish King Sigismund II Augustus granted Gdansk the right to religious freedom. The atmosphere of religious tolerance provided the direct incentive towards establishing the avant-garde school in the abandoned Franciscan abbey handed over to the City Council — the Gymnasium's objective was to cater for both Lutherans and the Calvinists and to offer all-round education in the fields of Theology, Philosophy, Ethics, Law, History, Grammar, Physics, Astronomy, and Medicine with particular stress on Anatomy. The academic staff recruited from among the leading contemporary scholars ensured that the school's academic level grew gradually since 1558. At that time it was not uncommon for the Gymnasium to come close to university level education, allowing those of its students who continued their education at full-profile European universities to achieve recognition in and excel at fields of knowledge previously studied at the Gymnasium [3].

In Gdansk, teaching medicine — especially its theoretical aspects — reached similarly fine level of education. Medical lectures first began in 1568, ten years after the opening of the Academic Gymnasium of Gdansk. Andreas Frackenberger (1536–1590), the graduate of the Wittenberg University and later Rector of the Academic Gymnasium of Gdansk (1567–1576), conducted the lectures and, although technically not a physician by education, he might have had some tuition in medicine during his studies with Philippe Melanchton (1497–1560). It was under Melanchton's influence, Mar-

Address for correspondence: A. Szarszewski, MD, PhD, Department of History and Philosophy of Medical Sciences, Medical University of Gdansk, ul. Tuwima 15, 80–210 Gdańsk, Poland, e-mail: aszar@gumed.edu.pl

tin Luther's acquaintance, that Frackenberger embarked on teaching the rudiments of medicine in Gdansk. Frackenberger's lectures were primarily based on his mentor's work *Liber de anima*. Still, at that time teaching anatomy at the forensic table was not accessible — lecturers and students alike had to rely on selected readings only. However — as Frackenberger strongly believed that cognition of the human body was a key to acquiring practical medical knowledge and that teaching anatomy at the Gymnasium brought grandeur to the school, to its lecturers and students — he advocated anatomy as fundamental to teaching medicine [3, 7].

Unfortunately, after Frackenberger left the Gymnasium, lectures on medicine were suspended until 1584 when the Faculty of Anatomy and Medicine was formed, and Wittenberg-educated Medical Doctor Johann Mathesius (1544–1607) was appointed lecturer. While lecturing, Mathesius relied on Melanchton's publication as well, and he also failed to perform autopsies in Gdansk. His lectures were meant primarily for the higher classes of society and took place twice a week. But it was not until Mathesius' successor, Joachim Oelhaf (1570–1630), that the teaching of forensic analysis at the Gymnasium was put on a new footing [7].

Oelhaf was born in Gdansk and attended the same Academic Gymnasium of Gdansk where he was exposed to the teachings of Mathesius. In 1588 he was granted City Council scholarship and left abroad. Like his two predecessors, he studied in Wittenberg and, later on, in Altdorf. It was there that he acquired a Medical Doctor's diploma (1593) and went on to continue his education at the University of Padova (1596–1597), the educational institution spearheading anatomical studies in Europe at the time; he then went to Bologna and Pisa and to Montpellier where he obtained a Philosophy Doctor's degree. During his academic work he is supposed to have come across Caspar Bauhin (1560–1624), but the circumstances of this alleged encounter are unclear. Yet, the possibility of Oelhaf engaging in epistolary acquaintance with Bauhin cannot be excluded. Bauhin had been a Professor of Greek at The University of Basel since 1582, and the Professor of Anatomy and Botany since 1589. When Oelhaf was still studying at foremost European universities, Bauhin had already been a renowned author of a breakthrough anatomical work *Theatrum anatomicum* (1592) and of his publication that discussed anatomical abnormalities *De hermaphroditorum monstrosorumque partuum natura, ex theologorum, jureconsultorum, medicorum, philosophorum et rabbinorum sententia, libri duo hactenus non editi* (1600). A scholar in Botany, Bauhin adopted the two-part botanical terminology for calling plants and renamed human vessels, nerves, and muscles with names that signified their characteristic features. This simple naming principle soon found widespread acceptance and has since been used in anatomical practice [2, 6–9].

The City Council scholarship enabled Oelhaf to further pursue his medical studies and gain thorough knowledge of anatomy, at that time the fast flourishing field of medicine. After returning to Gdansk, skills that Oelhaf mastered during his academic work came to good use while performing first autopsies, among others the autopsy of a child with pathological spleen and the autopsy of the Gdansk Gymnasium's professor — Bartholomaeus Keckermann (1572––1609). Those were, in essence, not public autopsies. Oelhaf, however, is alleged to have performed the public autopsy on the man's head in 1605.

Oelhaf's contribution to teaching anatomy in Gdansk cannot be overestimated. First, Oelhaf based his teaching on the accomplishments of the acclaimed Padova school of anatomy in Europe; second, he recorded his own observations while personally performing autopsies. By doing so, he departed from the long-established Frackenberger's method of teaching on the basis of Melanchton's dated work. Instead, Oelhaf published several of his own dissertations concerning the build and functions of various human organs [7, 8].

Oelhaf's *Foetus monstrosus in pago Prust territorii Dantiscani editus Anno Domini MDCXIII die 27 Februarii Bene fide delineatus et descriptus* (Dantisci: Typis Hünefeldi 1613) is regarded a milestone in his publications. In it he describes the post-mortem he performed on a child with multiple abnormalities. Quite importantly, the described autopsy is widely regarded as the first public autopsy not only in Gdansk and in Poland but also in Central Europe. On the 27th February, 1613 an abnormal birth was reported in the family of a shoemaker, Bartholomaeus Krop, in the not-so-distant village of Pruszcz (Prust, Praust; currently Pruszcz Gdański). Just after six o'clock in the morning, Krop's wife born three children: two girls and one child of unidentified sex. One of the girls died on 1st March 1613, while the second on 2nd March 1613. The third child, with multiple abnormalities, although giving some signs of life directly after birth, died soon.

Oelhaf's post-mortem report is concise but meticulous. The report was published by Andreas Hünefeld's

printing house, directly following the autopsy and one of the copies of the report was sent to Caspar Bauhin. Printed together with the autopsy report were the official letter to Bauhin dated 7th March 1613 and Oelhaf's private handwritten letter dated March 1613. In return for being granted insight into such a unique publication, Bauhin included Oelhaf's report in the re-edition of his work, *De hermaphroditorum monstrosorumquae partuum natura ex theologorum, jureconsultorum, medicorum et rabbinorum sententia: libri duo* (typis Hieronymi Galleri, Aere Johann-Theodori de Bry, Oppenheim 1614). On pp. 584–594 he cites the copy of the report along with the drawing of a deceased child and the covering letter. And so, with Bauhin's inclusion, Oelhaf's case went into scientific circulation, regardless of the original post-mortem report.

Oelhaf's autopsy report was divided into two sections: the first describing external looks (*QUO AD FORMAM externam*), and the second describing internal organs (*QUO AD PARTES internas*).

First, the author describes a notably big head with dilated sutures and cranial bones. The upper cleft lip was shaped like a harelip. Only the right eye-ball was spotted, the left one was missing. A membranous cyst covering both sides and back of the head was filled with light yellow substance which resembled vitreous humour of the eye or egg yolk. The thorax rather big, though narrow, was built of the elements such as skin, fat, muscles and bones.

Two upper extremities properly hanging from the top of the chest with shoulder blades noted. The right palm lacked the middle part the fourth finger, whereas the left palm lacked whole fourth finger. All fingers had proper fingernails.

During the examination, a thin membrane in a shape of a sack was visible in the frontal part of the abdomen. It contained a heart, a single lung, liver, spleen, stomach and intestines — all red in colour.

Single lower extremity was noted on the right side. It went to the left side, then bent and went towards the neck, up along the back. The foot had three toes with nails attached.

The second part of the report entitled "As to the internal parts" began with the description of the brain.

It was described as flaccid, in the middle divided into the right and the left part. Both upper ventricles were very large and filled with light yellow liquid (as in original — the author used *superior* instead of *lateral* ventricles). Both ears were properly developed.

Behind the tongue, the larynx and the trachea were placed, posterior to them the oesophagus was found. Close to it, three glands whitish in colour were reported. The left and the right glands were without any capsules, but with vessels. The middle gland was deprived of them.

After dissecting the diaphragm, a narrow heart was observed, hanging from the lowest part of the thorax. Traces of some sort of connection between the lung and heart could be seen. A heart-shaped conical appendix filled with blackish blood was noted as well. Close to it, there was something, apparently created by furled vessels, mostly veins, but without any parenchyma. To the left from it, another corpus was found, thick and round in shape. It presented a blackish and foul liquid on the cut surface. It looked like a spleen, with three bumps in a shape of a nipple on the internal surface.

Inside the trunk an elongated and considerably small stomach was noted, round, on the internal surface covered with milky and mucinous substance. Intestines were considerably thin, uniform in appearance, with whitish or yellowish substance in it.

Beside the lower part of the body, there was another *corpus glandulosum*, considerably hard, whitish, with something like a thorn or a spine in the middle. It was most probably the beginning for the long bone for the other missing extremity.

The skin with underlying muscles and tissues, on cut surface appeared whitish and spongy, spotted with small granules like fish eggs. From every incised part of the body yellowish fluid was flowing.

The umbilical cord was almost torn apart in half. Two big veins and only one artery, covered with single sheath were noted.

No traces of the urinary bladder or any part of the genital organs were observed. Consequently, there were no suggestions concerning the sex. According to the anatomist it was possible nevertheless, that the foetus was of a female sex. Mainly, because two other twin foetuses were girls. What's more, the coccyx was more flexed to the back, which was more often observed in women than in men.

Described foetus is one of the triples. This type of pregnancy increases the probability of having at least one malformed foetus to approximately 9% [4]. Morphological features of the Oelhaf's new-born seem to be the result of the early embryonic disturbances at 4th week of the embryo's development. The features of the abnormal foetus seem to illustrate the limb-body wall

complex (LBWC) — a congenital disorder characterised by limb and body wall defects. LBWC is an etiologically heterogeneous, very rare lethal malformation with low recurrence risk. A genetic predisposition has been suggested, but no chromosome and molecular bases have been established so far. The diagnosis is based only on the clinical picture. The two different phenotypes, according to the foeto-placental relationships are distinguished the placento-cranial attachment and the placento-abdominal adhesion characterised by thoraco--abdominal defects, lower limbs anomalies (club foot, absent limb/s), urogenital anomalies, anal atresia, short umbilical cord [1, 5]. Oelhaf's new-born seems to be explained by the second type of the LBWC (other name is the body stalk anomalies).

After the publication of his forensic analysis, Oelhaf became engaged in medical research, and conducted some laboratory tests on plague virus. He published the results in his work, *De seminario pestilenti* (1626) and dedicated the work to the Polish King Sigismund III Vasa. At the same time, he designed and built a botanical garden in Gdansk, where he began to grow medical herbs. As the city's physician, he was responsible for the sanitary conditions in Gdansk, especially at times of an epidemic. While performing his duties during one of the plagues that struck the city, he contracted the disease from his patients, soon died, and was buried at the Church of Our Lady in Gdansk. He had many children, and one of his sons, Nicolaus Oelhaf (1604–1643) followed in his father's footsteps and studied Medicine and Botany, especially herbal remedies. Like his father, Nicolaus also performed duties as the city's Physicus and a Royal Physician at the courts of the Kings of Poland [2, 3, 8].

Joachim Oelhaf is first in the line of eminent anatomists that lectured at Academic Gymnasium of Gdansk up until the first half of the 18th century. Besides Oelhaf, two prominent physicians deserve a special mention: Laurentius Eichstadt (1596–1660) and Johann Adam Kulmus (1689–1725). Their work was characterised by point-blank accuracy and by unrelenting dedication to teaching anatomy through forensic autopsy. Therefore, it was rather frequent in Gdansk to perform autopsies as part of academic classes and as public autopsies. Following the then contemporary fashion, these public autopsies often assumed the form of pompous, baroque ceremonies with ample participation of municipal authorities and representatives of the bourgeoisie. At that time the knowledge of anatomy became a must for future physicians and surgeons alike. The former, as members of the Barber Guild, lacked university degrees, but pursued their education at the Academic Gymnasium of Gdansk. As a result, the surgeons of Gdansk were highly qualified professionals by the 17th century European standards.

Oelhaf's scientific activity must be viewed within a period of the rapid growth of natural sciences, medicine among others, especially anatomy. Oelhaf's contemporaries debunked imprecise, often incomplete, and dated theories on the human body as proposed by Hippocrates and Galen which, in turn, led to a fresh outlook on forensic examination as such. Own judgment and meticulous analysis of data gathered during real--life examination of the body laid foundations for the modern science of human anatomy. But along with rapid advances in anatomy, a new scientific method was developing, although its progress was initially slow. The method aimed at diagnosing and describing all kinds of anomalies in the functioning of the human body. That said, it has to be understood that Oelhaf's and other 16th and 17th centuries anatomist's research was a milestone that several years later aided the development of a novel scientific field: pathological anatomy — the science that not only narrowed itself down to describing human body's abnormalities but also strived to explain these abnormalities by stating how much they deviated from the established norms.

Clearly, Oelhaf's work and his contemporaries' similar accounts failed to provide definitive answers as to the true nature of the diagnosed diseases, but these accounts were a turning point in trying to fully comprehend various medical conditions. Without doubt, the rapid advances in medical sciences that followed two generations after Oelhaf would not have been possible had it not been for his ground--breaking research.

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