

## ORIGINAL ARTICLE

# Cephalic Deformation in Ancient Greek Medicine and through Artistic Works

### Abstract

Ancient Greek medical literature and ancient Greek art are two valuable sources, in order to be understood the concept of cephalic deformities and especially hydrocephaly in Greek antiquity. Ancient Greek physicians considered hydrocephaly as a wider pathological phenomenon, than its definition by modern medicine. This difference probably is a result of the profound attachment of ancient Greek physicians to the theory of the four humors. On the other hand, ancient Greek artists represented human figures having the characteristics of many cephalic deformities among them also hydrocephaly as we conceive it today either as the only pathological characteristic of the figure or as a secondary one.

**Key words:** Ancient Greece Medicine; Cephalic deformities, Hydrocephaly; Down Syndrome, Dwarfism

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## Introduction

Many representations in ancient Greek art, especially terracotta figurines of the Hellenistic age, but not only, depict human figures with the characteristics of a corporal disease. These representations had various uses. They were used as medical models in the medical education in the famous schools of antiquity such as this of Smyrna and also served as realistic portraits and grotesque representations. The interest of the artists was focused mainly on deformities of the human body. This interest was a motive for the artists to represent cephalic deformities among them hydrocephaly. Hydrocephaly interested a lot ancient Greek physicians. The term hydrocephaly derives from the words water (Greek: hydōr) and head (Greek: cephalē), meaning the abnormal existence of fluid in the area of head<sup>1</sup>. Examining the cephalic deformities represented in ancient Greek art and also the medical literature concerning hydrocephalic we can learn a lot about artists' experience on real cephalic deformities and also about the conception of hydrocephaly of ancient Greek physicians, because the modern definition of this disease has differences comparing to the ancient one. This comparison gives us the opportunity to compare the ancient ideas about this pathological phenomenon with the modern ones.

1- Liddell - Scott, 1883: 1598.

## Ancient Greek Physicians on Hydrocephaly

Among the cephalic deformities only hydrocephaly attracted the great interest of ancient Greek physicians, therefore many descriptions of this pathology exist in their works and especially in the works of ancient Greek physicians of the late antiquity. The majority of them are saved indirectly in the works of some Byzantine physicians, while those in authentic medical texts are fewer. The lack of information in the works of other ancient Greek physicians earlier probably is a result of the loss of their texts, because we can infer a well established conception about the phenomenon and references to the earlier physicians by the surviving sources, which seems to have been existed diachronically in ancient Greek medicine.

The great difference of hydrocephaly between the modern definition of the disease and the ancient one is that the ancient Greek physicians diagnosed as hydrocephaly every abnormal concentration of liquid and blood in every place of the head, either in the skull or between the skull and the skin of the head. According this assumption hydrocephaly, as it is definite today, is only one form of the homonymous ancient



disease.

This conclusion is a result of the fundamental theory of ancient Greek medicine, the theory of the four humors (blood, phlegm, black and yellow bile), which when are well mixed, offer health and when are abnormally mixed or concentrated provoke the various diseases in every organ or place of the body, where this anomaly happens<sup>2</sup>. Therefore, it was obvious and well explained according this theory to be included in the phenomenon of hydrocephaly all the types of abnormal concentration of liquids in the area of the head.

The ideas about hydrocephaly of Leonidas of Alexandria (1<sup>st</sup> century B.C.), who was a follower of the episynthetic school, survived in the work of the Byzantine physician Aetius of Amida (middle 5<sup>th</sup> - middle 6<sup>th</sup> century A.C.), (Aetius Med. *Iatricorum liber vi* 1.1-2.8)<sup>3</sup>.

In this text is clear the reference that hydrocephaly can occur inside and outside the skull, while this medicine underlines that the older physicians believed that hydro-cephaly could also appear between the meninx and the cerebrum, which is fatal. Also the writer points out that the main reason is a traumatism of the head, which provokes the rupture of vessels, making it obvious that he is referring to the various diseases, which have as symptom the appearance of a tuber somewhere in the head. Especially for the newborns and infants he believes that the disease is a result of a trauma pro-voked of a brutal handling by the midwives. Surgery was evaluated as the only therapy in all cases of hydrocephaly.

These thoughts will appear in texts of the other physicians, fact which proves that they were the common and the unchallengeable principals about the disease in antiquity.

Hydrocephaly was examined also by Antyllos (2<sup>nd</sup> century A.D.) as we learn by the Byzantine physician Oribasios of Pergamon (ca. 325-395 A.D.), (Oribasius Med. *Collectiones medicae* 46.28.1.1-46.28.16.3)<sup>4</sup>. Very interesting is his observation that the head can be oblong as it is according the modern concept of hydrocephaly. He accepts three sites of hydrocephaly, between the skin and the epicranial aponeurosis, between the epicranial aponeurosis and the skull and also between the skull and the meninx, believing that it is impossible the case between the meninx and the cerebrum, because the patient in this case will be dead before the appearance of hydrocephaly.

Pseudo-Galen (2<sup>nd</sup> century A.D.) will refer hydrocephaly three times in his work (Pseudo-Galenus Med. *Definitiones medicae* 19.442.15-1<sup>5</sup>, Pseudo-Galenus Med. *Introductio seu*

2- Schöner, 1964: 1-80.

3- Olivieri, 1950: 123-249.

4- Raeder, 1928-1933: 4-237.

5- Kühn, 1965 (a): 346-462.



*medicus* 14.782.14-17, Pseudo-Galenus Med. *Introductio seu medicus* 14.783.4-7)<sup>6</sup>. We do not see any differences about the disease as the other ancient physicians, but we can underline that he accepts four places of hydrocephaly, that is the three which are described by Antyllos adding also the case of hydrocephaly between the meninx and the cerebrum.

The only reference to hydrocephaly in the work of Aretaeus of Cappadocia (2<sup>nd</sup> or 4<sup>th</sup> century A.D.), (Aretaeus Med. *De causis et signis acutorum morborum* 2.1.13.1-4)<sup>7</sup>, is a part in his discussion about the abnormal concentration of humors in various organs, where the head is one them. This reference is an unquestionable proof about how ancient Greek physicians formed their ideas about hydrocephaly and were led to this special concept of the disease. Finally, we can mention that the presentation of hydrocephaly by the Byzantine medicine Paul of Aegina (7<sup>th</sup> century A.D.), (Paulus Med. *Epitome medicae libri septem* 6.3.1.1-6.3.2.12)<sup>8</sup>, is analogous to this of Leonidas of Alexandria.

#### **Cephalic Deformation in Ancient Greek Art**

On the other hand representations of human figures under the characteristics of cephalic deformities exist in ancient Greek art. These representations concern terracotta or metal figurines<sup>9</sup> depicting mainly male, child or adult heads, while the majority of them are dated in the Hellenistic period, time when the realistic representations were in great favor. We can divide this material in two categories. The first one includes the representations which have cephalic deformities as the only pathological characteristic and the second those which this deformity is a symptom of another disease.

#### **Examined Material (Figures)**

In the first category there are nine examples (no.1-9) of terracotta figurines. Five of them (no.1-5) have a very prolonged head, while the rest four (no.6-9) depict cephalic deformation in milder form. No. 1 and 6 represent the characteristics of craniosynostosis, while no.4 represents the characteristics of fronto-occipital artificial skull deformation and no. 5 the characteristics of coronal suture synostosis (anterior plagiocephaly). The rest of this group represent the characteristics of hydrocephaly. No.2 and 3 due to their elongation probably represent the characteristics of congenital hydrocephaly, while the remaining of acquired one.

The second category consists of three examples. The older one (no.10) is a terracotta Neolithic figurine presenting a

6- Kühn, 1965 (b): 674-797.

7- Hude, 1958: 36-90: 1-4.

8- Heiberg, 1921-1924: 1-12.

9- Von Sacken - Kenner, 1866: 271.



head of child, which has all the characteristics of Syndrome Down, while hydrocephaly accompanies this pathology as secondary symptom. The protuberant superciliary and the low rhinal curvature in combination with the shape of the eyes, the cheeks and the hydrocephaly are definite characteristics of Syndrome Down.

**Table 1: Material**

Figures	Provenance	High (Cm)	Collection	Description
1. Terracotta figurine (Figure 1)	<i>Memphis</i>	4,0	Missing	Head of child with the characteristics of craniosynostosis. Date: 4th - 5th century B.C. <sup>10</sup> .
2. Terracotta figurine	<i>Black Sea</i>	4,0	Bucharest, Collection Dr. H. Slobonzianu	Head of child with the characteristics of hydrocephaly. Date: Hellenistic Age <sup>11,12</sup> .
3. Terracotta figurine	<i>Asia Minor</i>	3,5	München, Sammlung Loeb	Head of a man with the characteristics hydrocephaly. Date: Hellenistic Age <sup>13</sup> .
4. Terracotta figurine (Figure 2)	<i>Unknown</i>	3,5	London, British Museum: 1883.7-24.2	Head of a man with the characteristics of fronto-occipital artificial skull deformation. Date: Hellenistic Age <sup>14,15</sup> .
5. Terracotta figurine (Figure 3)	<i>Alexandria</i>	5,0	Paris, Collection Fouquet: 470	Head of a man with the characteristics of coronal Suture Synostosis (anterior plagiocephaly). Date: Hellenistic Age <sup>16</sup> .
6. Terracotta figurine (Figure 4)	<i>Unknown</i>	4,5	London, British Museum: 1953.5.1.4	Head of child with the characteristics of craniosynostosis. Date: Hellenistic Age <sup>10,11</sup> .
7. Terracotta figurine	<i>Asia Minor</i>	3,3	Kopenhagen, Nationalmuseet: 3355.	Head of child with the characteristics of hydrocephaly. Date: Hellenistic Age <sup>11,17</sup> .
8. Terracotta figurine	<i>Egypt</i>	4,6	Karlsruhe, Badischen Landesmuseum:	Head of a man with the characteristics hydrocephaly. Date: 4th quarter of the 3rd century B.C. <sup>18</sup> .
9. Terracotta figurine	<i>Egypt</i>	6,0	Berlin, Ägyptischen Museum: 15365.	Hydrocephalic head of a man. Date: 2nd century B.C. <sup>19</sup> .
10. Terracotta figurine	<i>Thessaly</i>	5,5	Volos, Athanasakejo Archaeological Museum: M 5197	Head of child with the characteristics of Down's syndrome and hydrocephaly. Date: Neolithic Age <sup>20</sup> .
11. Terracotta figurine (Figure 5)	<i>Tarant</i>	1,5	Berlin, Staatliche Museen, Antikensammlung: 7788.	Representation of a child or young man standing with the characteristics of achondroplasia. His head is deformed (large) due to the disease wearing toga. Date: Hellenistic Age <sup>11,21,22</sup> .
12. Bronze figurine (Figure 6)	<i>Unknown, Missing</i>	1,5	Vallentin du Cheylard á Montélimar	Representation of a man with the characteristics of achondroplasia and hydrocephaly wearing a cloth and sitting on a giant replica of scrotum. Date: Hellenistic Age <sup>11,23</sup> .

- 10- Richter, 1960: 31  
 11- Stevenson, 1975: 245.  
 12- Canarache, 1969: 164.  
 13- Sieveking, 1916: 22.  
 14- Walters, 1903: 226.  
 15- Burn - Higgins, 2001: 150.  
 16- Perdrizet, 1921: 164.  
 17- Breitenstein, 1941: no.514.  
 18- Schürmann, 1989: 321.  
 19- Philipp, 1972: 20.  
 20- Theochari, 1993: 64.  
 21- Holländer, 1912: 341.  
 22- Winter, 1903: 447  
 23- Reinach, 1897-1930: 354.

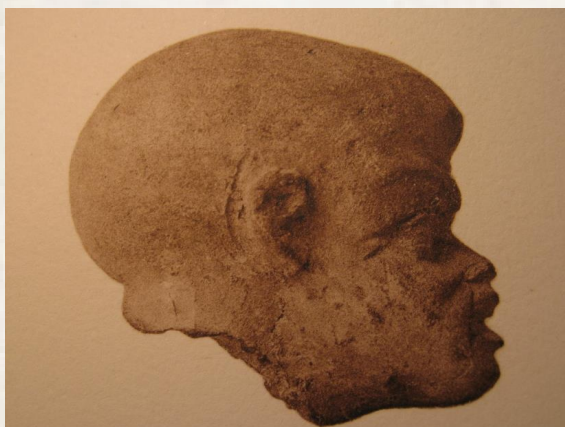




*Figure 1. Terracotta figure representing a head of child with the characteristics of cranio-synostosis*

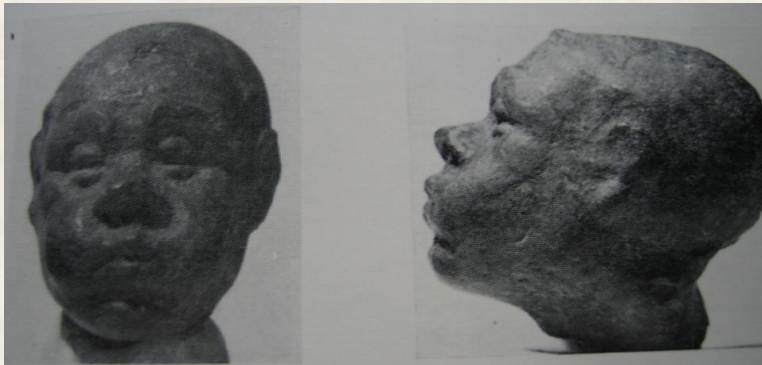


*Figure 2. Terracotta figure representing a head of a man with the characteristics of fronto-occipital artificial skull deformation*



*Figure 3. Terracotta figure representing a head of a man with the characteristics of coronal Suture Synostosis(anterior plagiocephaly).*





*Figure 4. Terracotta figure representing a head of child with the characteristics of cranio-synostosis*



*Figure 5. Terracotta figure representing a child or young man standing with the characteristics of achondroplasia. His head is deformed (large) due to the disease*





*Figure 6. Terracotta figure representing a man with the characteristics of achondroplasia and hydrocephaly*

Two other Hellenistic figurines, the one terracotta (no.11) and the other metal (no.12), represent achondroplastic dwarfs. The juvenile face in the terracotta figurine no.11 does not allow a clear identification, whether represents a child or a young man. His long head is deformed due to achondroplasia, while it is obvious that the intention of the artist was to ridicule the figure of an ancient orator as is identified the figure by the toga which wear, with the presentation of these pathological characteristics. Similar was the intention of the artist of the metal figurine who had in mind to create a grotesque figure. Therefore he created an achondroplastic dwarf with hydrocephaly, which is obvious due to the elongation at the back of the head, to ride a giant scrotum.

### **Conclusion**

The examination of cephalic deformities in ancient Greek medical texts and in ancient Greek art was very useful, because we were able to see how this phenomenon received a special context by ancient Greek physicians due to their at-





tachment to the theory of the four humors and also we understood how it was exploited by ancient Greek artists, in order to present realistic or grotesque representations.

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