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HISTORICAL VIGNETTE

HYPOPYON FORGING, IUSTUS' TECHNIQUE TO CURE PUS COLLECTIONS AFTER HEAD BLOWS

Gregory TSOUCALAS[1]✉, Efstathios DETORAKIS[2], Andreas MANIOS[3]

[1] History of Medicine and Deontology of Medicine Department, School of Medicine, University of Crete, Heraklion, Greece
[2] Ophthalmology Department, School of Medicine, University of Crete, Heraklion, Greece
[3] Plastic Surgery Department, University Hospital of Heraklion, Crete, Greece

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Abstract

Galen mentioned Iustus the ophthalmologist, who, during the second century AD introduced a method with head maneuvers to confront non-bleeding head traumas resulting to acute suppurations. The pus was forced to be concentrated in such a way to form a hypoyon. With this method, the treatment was successful through gravity alone, or in cases with a big enough pus volume, a simple incision could alleviate the area. Maneuvers of the head are nowadays in medical practice. The core idea of this historical therapeutic maneuver testifies the pioneering thinking of the ancient Greek physicians.

Keywords: ophthalmology, head maneuvers, massage, Galen, ancient Greece.

List of abbreviations:
AD: Anno Domini
BPPV: benign paroxysmal positional vertigo
TOS: thoracic outlet syndrome

Résumé

Forgeage d'hypopyon, la technique d'Iustus pour soigner les amas de pus après des coups à la tête

Galien mentionne l'ophtalmologiste Iustus qui, au cours du 2e siècle après J.-C., a introduit une méthode de manœuvres de la tête pour faire face aux traumatismes crâniens non hémorragiques résultant de suppurations aiguës. Le pus était forcé de se concentrer de manière à former un hypoyon. Avec cette méthode, le traitement réussissait par la seule gravité, ou dans les cas où le volume de pus était suffisamment important, une simple incision pouvait soulager la zone. Les manœuvres de la tête sont aujourd'hui utilisées dans la pratique médicale. L'idée centrale de cette manœuvre thérapeutique historique témoigne de la pensée pionnière des médecins grecs de l'Antiquité.

Mots-clés: ophtalmologie, manœuvres de la tête, massage, Galien, Grèce antique.

✉ Address for correspondence: Gregory TSOUCALAS
Address: School of Medicine, Voutes, Heraklion, 71003 PC, Greece
E-mail: gregorytsoukalas@uoc.gr

Introduction

During the second century AD, Iustus the ophthalmologist (ca mid-second century AD) introduced a curative technique for suppurations, mainly for collections of pus, hypopyon (Greek: υπόπυον), in the anterior chamber of the eye[1]. Iustus was only mentioned by Galen as his contemporary eye physician (Greek: οφθαλμικός) and would have remained unknown if it wasn't for Galen who although did not adduced a written text from Iustus, he claimed to have witnessed the procedure[1-2]. For the ancient Greeks, the broader term ophthalmia (Greek: οφθαλμία) meant not only an inflammation of the eye, but a disease as a result of concentration of phlegm, one of the four humors of the Hippocratic theory for explaining human physiology. Increased mucous secretion, excessive tears, redness, swelling, collections of pus, tumours, constitute a heterogeneous cluster of pathological entities to cause ophthalmia. The term itself means tears of phlegm and under it all these diseases may be categorized. Physicians of the Greco-Roman world dealt with eye diseases and most probably ophthalmologists existed as a special medical branch (Figure 1), while the tradition existed in ancient Greek mythology with god Apollo being the first eye healer and the pre-existed knowledge was cultivated by the ancient Egyptians[3]. This historical vignette surveys Iustus and his method to confront post-traumatic or inflammatory collections of pus in the front part of the cranium, ironically by causing an ophthalmia through hypopyon.

The method

Iustus technique was designed to cure pus collections after head blows, by a simple method under physician's help and guidance. The patient should sit in a chair called difros (Greek: δίρφος), an obstetrician's chair, as mentioned by Galen, or in a stool as noted by Paul of Aegina, with his head tilted slightly to the left or to the right. The eye physician was holding with both his hands patient's head, shaking them in such a way to clearly observe the pus descending downwards. The pus remained down, unlike the watery substances (Greek: υποχύματα, meaning eye cataract)[2,4]. Paul of Aegina was the second great physician of the Hellenic past to have quoted Iustus some eons later[4-5], with no other references to exist in ancient Greek and Byzantine literature[1]. Iustus' maneuver was a hypopyon forging technique. Careful and planed movements of the head resulted for all



Figure 1. An ophthalmologist examines the eyes of his patient, Lower relief of the 2nd century Rome, Museo della Civilta Romana

liquids after an acute head non-bleeding trauma to be concentrated to the area of the lower eye lid, forming a hypopyon in the case of a non-eye direct blow. Pus "forcibly" concertation in a specific area in the lower parts of the head, following head movements, could have also helped vision, by avoiding eye closure due to an edema. Moreover, a simple surgical cut, if it was needed, could alleviate edema after a few hours[2].

Discussion

We must not confuse ophthalmologist with Iustus the pharmacologist who was cited by Oreibasius[1,6]. In ancient times, the hypopyon as a condition was treated with drugs, mainly drying and anti-inflammatory preparations of plant origin, while multitude preparations of eye drops were described in medical treatises of Alexander of Tralles[7]. Meanwhile, a surgical intervention, a simple incision just under the lower eye lid area for the drainage of pus was possible after a series of manipulations such as the Justus maneuver, which were considered helpful for the movement and concertation of pus before cutting the skin just downwards the collection[2]. Invasive techniques in plastic surgery to confront sagging eye fat present similarities to Iustus' core idea of alleviating the area[8]. The use of head movements has long been an important tool in the diagnosis and treatment of various conditions. From ancient times to the present day, these movements have been used to manage problems of the vestibular system, head and neck issues, eye lesions and blood circulation. Two modern diagnostic techniques are worldwide in use nowadays, i) Dix-Hallpike test, used to diagnose benign paroxysmal positional vertigo (BPPV). This test induces nystagmus and vertigo through head movement, revealing the condition[9] and ii) Adson test, for the diagnosis of thoracic outlet syndrome (TOS). The doctor moves the patient's head towards the affected side while monitoring the radial artery pulse[10]. Moreover, three therapeutic techniques dwell in modern practice, i) Epley maneuver, used to terminate BPPV. The patient performs a series of head movements to move the otoliths into the semicircular canals of the inner ear[11], ii) Semont maneuver, similar to Epley, but with more abrupt movements to restore the position of the otoliths more quickly[12] and TOS treatment, which includes exercises and head and cervical spine movements to relieve compression of nerves and blood vessels[13]. All mentioned techniques are non-invasive but require precision and extreme care to avoid injuries. The Justus maneuver was similar to modern techniques such as the Epley maneuver, as they both use gravity and head movements to move unwanted wax, liquids or otoliths, while in both methods the movement is carefully guided by the therapist. The Iustus manipulation was applied to treat pus concentrations by forming a hypopyon, while modern manipulations target diseases of the vestibular system, presenting structured methodology and documented practice in terms of scientific research. Iustus maneuver was aimed to relief from pain and discomfort with avoidance of more invasive procedures and immediate movement of pus, facilitating drainage with a small incision. On the other hand, Iustus movements could damage the cornea or other parts of the eye due to sudden shifting, provoke worsening of inflammation or rupture of the abscess in uncontrolled areas and induce dizziness or neck injury in patients with neck problems.

Friction, kneading, manipulating, rolling the external tissues of the human body with a curative, palliative purpose, combined with passive, restive and assistive movements, and all other manual therapeutics, formed the specialty of massage or hand treatment in ancient times. Thus, by definition, Iustus maneuver falls in the specialty of malaktes (Greek: μαλάκτες, para-medical personnel for massage), from the Greek term masso, which means I knead, or I handle, or I press softly[14]. A technique in the borders of ophthalmology and massage, Iustus' maneuver testified the wider knowledge of the ancient Greek physicians, who had been practiced in various medical fields, philosophy, botany and practical therapeutics.

Since the Hellenistic period, the distinction of ophthalmology as a specialty was mentioned by Herodotus, and various tools and techniques appeared to treat eye diseases. Heliodorus (1st century AD), the Greek surgeon from Egypt, applied himself to the surgery of the eye, while Demosthenes Philalethes of Marseilles (1st century AD) had also dealt with various issues in Ophthalmology. However, most of their treatises have been lost, but many of their concepts and practices have fragmentally passed and saved into the works of Galen and of later writers like Oribasius (ca 320-403 AD). This was the case of Iustus, who gave as a peculiar therapeutic method[15].

Epilogue

Iustus' method is a historical therapeutic technique that demonstrates the ingenuity of ancient Greek physicians in draining pus. Its comparison with modern techniques highlights the value of head movements in the treatment of various pathological conditions. Despite its benefits, its application requires caution and good training to avoid complications.

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G.T. conceived the original draft preparation. A.M., G.T., and E.D. were responsible for conception and design of the review. A.M., and G.T. were responsible for the data acquisition. A.M., E.D., and G.T. were responsible for the collection and assembly of the articles/published data, and their inclusion and interpretation in this review. A.M., E.D., and G.T. contributed equally to the present work. All authors contributed to the critical revision of the manuscript for valuable intellectual content. All authors have read and agreed with the final version of the manuscript.

Compliance with Ethics Requirements:

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"The authors declare that all the procedures and experiments of this study respect the ethical standards in the Helsinki Declaration of 1975, as revised in 2008(5), as well as the national law."

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