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# Imperforate anus and perianal fistula in Ancient Greek medical writings

Gregory Tsoucalas<sup>a</sup>, Fotini Gentimi<sup>b</sup>, Antonis A. Kousoulis<sup>a</sup>, Marianna Karamanou<sup>a</sup>, George Androutsos<sup>a</sup>

Medical School, University of Athens; Private Hospital Mitera, Athens, Greece

## Abstract

Anorectal malformations remain a challenging topic in pediatric surgery, known since antiquity. In our paper we expose the main descriptions and therapeutic approaches of imperforate anus and perianal fistula through the works of the ancient Greek and Byzantine physicians.

**Keywords** imperforate anus, perianal fistula, Hippocrates, Oribasius, Paul of Aegina

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Anorectal malformations remain one of the challenging topics in pediatric surgery. Despite developments in assessing and approaching patients with these anomalies in the past decades, there exist, however, tangible descriptions of imperforate anus and perianal fistulas at least since the Middle Ages [1,2]. Tracing the earlier origins of the relevant practice, by browsing through the works of ancient Greek and Byzantine medical writers, we encounter interesting, pioneering observations in Gastroenterology.

As derived from his writings, Hippocrates (ca. 460-370 BC), was aware of anorectal fistulas and tried to interpret their mechanism of origin. He attempted to treat them, either conservatively, using laxatives and purgative medications, or surgically, via an anoscope (εδροσκοπίο) [3,4]. He had very well understood the importance of the surgical option which is now a routine choice. In fact, a variety of operations exist mainly aiming to decrease recurrence and incontinence rates [5].

In Aristotle's (384-322 BC) works, we run into references on imperforate anus (he states it as *σύμφυση του πρωκτού*), and rectourethral or anorectal fistulas, mainly in animals. He also recorded a failed attempt to restore an anorectal ring atresia. In particular, he stated:

*"Some animals have already been diagnosed with anal symphysis. Someone even pointed out, in the village of Perinthos, the excretion of fine food with the urine in a cow, due to its infiltration from the intestine to the bladder, and when*

*a membrane incision was performed, soon adhesions emerged once again and food was excreted via the bladder"* [6,7].

It is clear that he has referred to anal atresia, rectovesical fistula and an attempt for ring restoration. The principles for the operative technique resemble modern surgical methods. However, nowadays, an incision is performed on the anal membrane and the operation concludes with anorectal plastic surgery, including mobilization of the central imperforate rectal stump which is sutured on the anus through the sphincters. Further operative management and introduction of laparoscopy techniques contribute to the repair of anorectal malformations [8,9].

Oribasius (ca. 320-400) devoted a special chapter "*On Imperforate Anus*" (*Περί Ατρήτου Έδρας*), suggesting a manipulation of opening up by hand prior to surgery [10]. This opening up seems valid up until now, though, instead of hands, scalpel and special surgical retractors are used in order to achieve better control of the area for the detection of the imperforate part which may be behind the anal membrane or even higher [11].

Moreover, Aëtius of Amida (ca. 6th century AD), recognized perianal fistulas and treated them via "*the stone plaster of the Persians, the one called tyrinis (τυρινίς) and pampathis (παμπαθής)*". He also tried another technique, "*the fresh uriginea (δια σκίλλης χλωράς), like Asclepiades*". He underlined: "*In cases of fistulas with a narrow opening, having a placenta prepared in the shape of a worm, and after performing dilation and enema with mead or oenomele, we inject the drug, cover with a plaster and swathe*" [12].

In cases of anal fissures, he introduced a special cannula in the rectum in order to grease with goose fat, the so called "*ihion*" (*ύειον*) [12]. Modern conservative techniques resemble Aëtius' suggestions, even though substances, including fibrin glue injections, paraffin oils, nitroglycerin and laxatives, have replaced his concoctions [11,13].

Paul of Aegina (ca. 625-690), devoted a special chapter "*On imperforate ring*" (*Περί Δακτυλίου Ατρήτου*) [14] in which he suggested opening up by hand prior to the surgical intervention.

<sup>a</sup>History of Medicine Department, Medical School, University of Athens, Greece (Gregory Tsoucalas, Antonis A. Kousoulis, Marianna Karamanou, George Androutsos); <sup>b</sup>Private Hospital Mitera (Fotini Gentimi), Athens, Greece

Correspondence to: Marianna Karamanou, MD, 4 Themidos St., Kifissia, 145 64 Athens, Greece, Tel: +30 697 3606804, Fax: +30 2108235710, e-mail: mariannakaramanou@yahoo.com

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In cases of recurrence in infants, he recommended the use of a small lead tube until recovery: “In the infants whose ring does not have a natural opening, there is a probable blockage by a membrane. So, if possible, we open up the membrane with our finger, or cut through with the edge of small chisel, and treat the area with wine. Frequently, in inadequately healed wounds in normally developed newborns, adhesions are formed at the ring; we should have it broken with a suitable tool and place a lead tube or a small spike to the ring, until perfect recovery” [14,15]. Contemporary practice loosely reminds one of Paul of Aegina’s technique; after the surgical procedure reformation of the ring takes place and dilations are performed using suppositories to prevent stenosis [11].

In addition, Leo the Philosopher (ca. 790-869) wrote a distinct chapter “On Ring Perforation” (Περὶ Διατρήσεως ἐν τῷ Δακτυλίῳ), in which he suggested surgical repair by a “special instrument resembling a sickle” [16], which reminds us of modern retractors.

The methods described in older textbooks have served as a guide in planning the evolution of the modern attempts. Just as the ancient Greek writers suggested, the best outcomes are achieved when medical and surgical therapies – if needed – are used in conjunction [1,17].

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