

ANORECTAL DISEASES IN AVICENNA'S "CANON OF MEDICINE"

ANOREKTALNE BOLESTI U AVICENINU "KANONU MEDICINE"

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SUMMARY

Although the development of modern medicine has helped us detect and treat diseases better than in the past, especially in the field of surgery; the history of medicine may be a trigger that can help us use neglected aspects of prior knowledge for the advancement of modern-day science. Since historical papers that have specifically focused on anorectal diseases are rare, but those that exist contain brief discussions in this field, the current study aims to present a detailed review of Avicenna's approach to anorectal diseases. Therefore, we reviewed On the Diseases of the Anus, the 17th chapter of the third volume of the Canon of Medicine written by Avicenna, and compared his views on the classification and diagnosis of, and the approach to anorectal diseases with that of modern proctology. Avicenna discussed in detail about anorectal diseases such as hemorrhoid, fissure, perianal abscess and fistula, rectal prolapse, fecal incontinence, and pruritus ani. In addition, we introduce herbs which

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Avicenna used to treat these diseases. Our findings show that Avicenna's views on the classification and diagnosis of, and the approach to anorectal diseases have few fundamental differences with modern medicine. In addition, the pharmacological effects of some of the herbs that were recommended by Avicenna, and are used in current medicine are proven. Thus the Medieval knowledge can be further scientifically investigated to develop new therapeutic options for anorectal diseases.

Key words: Anus diseases; Avicenna; Canon of Medicine; History of Medicine; Proctology; Rectal diseases; Traditional Persian Medicine.

INTRODUCTION

Different anorectal diseases have been known since ancient times. Egyptians discussed hemorrhoid, pruritus ani, anal abscess, and rectal prolapse in their medical papyri. For example, a part of the Chester Beatty Papyri (a group of early papyrus manuscripts of biblical texts) was exclusively devoted to anorectal diseases [1]. Treatments for these diseases included suppositories and enemas containing honey, junipers, myrrh, flour, senna, colocynt, and other herbal ingredients [2]. Compared with the Egyptians, the Ancient Greeks seem to have focused more on surgical treatments for anorectal diseases. Hippocrates (460-377 BC) discussed anorectal diseases and their treatments in his manuscripts "On Fistula" and "On Hemorrhoids". He also identified the relationship between anorectal abscess and the resulting fistula and treated these conditions with stenting and ligature techniques. Galen (129-199 AD) contributed little to the treatment of anorectal diseases. Paul of Aegina (625-690 AD) made a precise description of procedures for hemorrhoidectomies and ligations of anal fistulas.

In the Islamic Golden Age (9–12th century AD), many medical scholars such as Rhazes (865–925 AD) [3, 4], *Al-Akhawaini* (?-983 AD) [5, 6], Haly Abbas (949-982 AD) [7, 8], Avicenna (980–1037 AD) [9, 10] and *al-Baghdadi* (1162-1231 AD) [11, 12] discussed anorectal diseases in their treatises. Among them, Avicenna presented the most comprehensive discussion on anorectal diseases in the 17th chapter of the third volume of his medical encyclopaedia *Al-Qanun fi al-Tibb* (The Canon of Medicine) [9].

Avicenna (*Ibn-e-Sina*), a Persian physician, was one of the most outstanding medical scholars and practitioners of all time. He influenced the medical sciences greatly in the Golden Age of Islamic Medicine. Avicenna contributed to various aspects of medicine, including gastroenterology and surgery. He wrote almost 450 treatises on a wide range of subjects, including medicine [10]. His most important medical manuscript, the Canon of Medicine was

translated into Latin in the 12th century AD, and was taught at Western universities from the 13th to the 18th centuries AD[13]. The Canon of Medicine is divided into five volumes. The third volume contains general principles of diagnosis and treatments of diseases of different organs. The 17th chapter, *On the Diseases of the Anus* discusses hemorrhoid, fissure, perianal abscess and fistula, rectal prolapse, fecal incontinence and pruritus ani. The current study reviews Avicenna's point of view on anorectal diseases and their treatments from its original Arabic text [9].



Figure 1. The chapter of anorectal diseases from the manuscript of “Canon of Medicine” (1st page), Iranian parliament library.

HEMORRHOID

In the Canon of Medicine and all other Traditional Persian Medicine books, hemorrhoid was referred to as *Bavasir*. Before discussing hemorrhoids, Avicenna emphasized that physicians must differentiate them from rectal ulcers (*Ghorhe*) and other intestinal diseases.

Avicenna categorized hemorrhoids into two types, external (*Naetea*) and internal (*Ghaera*). External hemorrhoids were classified into three subtypes according to their appearance: grape-shaped (*Enabi*), wart-shaped (*Soluli*), and berry-shaped (*Tothi*). Internal hemorrhoids were classified as hemorrhagic (*Damiye*) and non-hemorrhagic (*Gheyre- Damiye*). Avicenna determined that internal and wart-shaped external hemorrhoids had the worst prognosis.

Avicenna based his diagnoses on humoral theory (common medical theory in medieval Persia) and knew three humors as the causes of hemorrhoids: *Sauda* (Black bile) which was more prevalent, a combination of *Dam* (Blood) and *Sauda* (Black bile), and *Balgham* (Phlegm).

Dietary modification, oral and topical drugs, *Fasd* (Phlebotomy), *Abzan* (Sitz bath), and surgery were Avicenna's methods for treating hemorrhoids. In addition he noted that constipation, as a risk factor for haemorrhoids, should be treated first [9]. Some herbs mentioned in the Canon of Medicine for use in treating anorectal diseases are listed in Table 1.

Table 1. Herbs used in anorectal diseases in Avicenna's Canon of Medicine

Scientific name	Common name	Name in "Canon"	Indication in "Canon"	Current known effects
Commiphora mukul	Guggal	Moghl	Hemorrhoid, fissure	Anti-inflammatory [16]
Armeniaca bulgar	Apricot	Meshmesh	Hemorrhoid, fissure	
Allium ampleoprasum	Wild leek	Korrath	Hemorrhoid, abcess	Antimicrobial effect [17]
Apium graveolens	Celery	Karafs	hemorrhoid	Antioxidant activity [18]
Citrullus colocynthis	Colocynth	Hanzal	Hemorrhoid, prolapse, incontinency	Antioxidant activity [19]
Centaurea cyanus	Cornflower	Ghantorion	Hemorrhoid	Anti-inflammatory and immunological effects [20]
Levisticum officinale	Lovage	Anjedan	Hemorrhoid	Antimicrobial activity [21]

Scientific name	Common name	Name in “Canon”	Indication in “Canon”	Current known effects
<i>Capparis spinosa</i>	Caper	<i>Kabar</i>	Hemorrhoid	Anti-inflammatory and Antioxidant activity [22, 23]
<i>Piper nigrum</i>	Black pepper	<i>Felfel</i>	Hemorrhoid	Antioxidant, Anti-inflammatory and Antinociceptive effect [24]
<i>Anethum graveolens</i>	Dill	<i>Shebet</i>	Hemorrhoid, prolapse	Antinociceptive effect [25]
<i>Linum usitatissimum</i>	Linseed	<i>Bazre katan</i>	Hemorrhoid, abcess	Anti-inflammatory effect [26]
<i>Artemisia absinthium</i>	Absinthium	<i>Afsantin</i>	Hemorrhoid, fissure	Antimicrobial and antioxidant activity [27]
<i>Physalis Alkekengi</i>	Bladder cherry	<i>Kakanaj</i>	Abcess	Antimicrobial activity [28]
<i>Rosa damascena</i>	Damask rose	<i>Vard</i>	Abcess, fissure, prolapse, fistula	Anti-inflammatory, Antimicrobial, antioxidant and laxative effects [29]
<i>Matricaria chamomilla</i>	Chamomile	<i>Babunaj</i>	Abcess	anti-inflammatory and antiseptic activity [30]
<i>Althaea officinalis</i>	Marsh mallow	<i>Khatmi</i>	Abcess	Antimicrobial and anti-inflammatory effects [31]
<i>Punica granatum</i>	Pomegranate	<i>Golnar</i>	Fissure	Antioxidant, antimicrobial and wound healing effects [32]
<i>Myrtus communis</i>	Myrtus	<i>Aas</i>	Fissure	Antioxidant and antimicrobial activity [33]
<i>Cheilocostus speciosus</i>	Crepe ginger	<i>Qost</i>	Incontinency	Anti-inflammatory effect [34, 35]
<i>Rhus coriaria</i>	Sumach	<i>Somagh</i>	prolapse	Antiseptic and antioxidant effect [36]

PERIANAL ABSCESS

Avicenna believed that most anal abscesses (*Varam-e-hār*) do not occur primarily. He said most abscesses occur following a fissure, pruritus ani, obstructed hemorrhoids, or after hemorrhoid surgery. According to the Canon, medications that cause mucosal damage in the rectum (*Advieye-e-hād*) carry the risk of anal abscess formation.

Avicenna recommended that, since anal abscesses can lead to the development of fistulas (*Navasir*), they should be drained as soon as possible. Performing a phlebotomy was Avicenna’s first suggestion for the early phases

of abscesses formation, in order to reduce the severity of the disease. *Takmid* or warm compress was another treatment applied by Avicenna [9].

ANAL FISSURE

Avicenna named the causes of *Sheghagh* or fissure as constipation, hemorrhoid, peri-anal abscess and inflammation. He divided the drugs effective in treating anal fissures into four groups: laxative (*Molayen*) and stool softening (*Morateb*), wound healing (*Modamel*), anti-inflammatory (*Moalejat al Varam*) and fissure specific (*Belkhasiah*) drugs.

Diet therapy was also a part of the fissure treatment practiced by Avicenna. For example, he recommended patients to include spinach soup, fat foods, rump, chicken or duck tallow, simple cabbage pottage, egg yolks, eek and onion omelet with egg yolk, coconut, and almonds in their regimen and avoid pickles and astringent foods [9].

ANAL INCONTINENCE

Avicenna hypothesized that anal incontinency (*EsterkhayeMagh'ad*) may occur after a hemorrhoidectomy or an anal fistula surgery because of injury to the sphincter muscles. He also mentioned back trauma and a fall resulting in nerve injury as other incurable causes of incontinency. He said that if a patient had sensory loss in the perineum, treating incontinency would be difficult. In the humoral theory of Avicenna, incontinency can present primarily due to excessive moisture and coolness in the perianal area. A sitz bath with astringent herb extracts was an important part of the incontinency treatment mentioned in the Canon of Medicine [9].

RECTAL PROLAPSE

Avicenna believed rectal prolapse (*Khoruj-eMagh'ad*) was associated with two factors: severe anal supporter muscle insufficiency and protruding edema. Avicenna recommended some astringent herbs to be used after a rectal prolapse reduction [9], and these are shown in the Table 1.

ANORECTAL FISTULA

Perianal Abscess, hemorrhoids, rectal ulcers, and anorectal lacerations were mentioned in the Canon of Medicines predisposing factors for anorectal fistula (*Navasir*). Avicenna described an examination method practiced by his predecessors for detecting fistula tracts. In this method, a digital rectal examination is performed and a probe is sent into the fistula simultaneously. In addition, Avicenna used a procedure comparable to the current seton

for the treatment of fistulas. He applied a plait of hair into the fistula tract to curb it. He was also concerned about incontinency as a complication of fistula surgery [9].

PRURITUS ANI

The final disease discussed in this chapter is pruritus ani (*Hakkat-ol-Magh'ad*). Avicenna believed that pinworms, rectal ulcers, and intestinal irritant discharge (humors) could cause anal pruritus [9].

OVERALL PROGNOSIS OF ANORECTAL DISEASES

Avicenna discussed the overall prognosis of anorectal diseases as the first point in *On the Diseases of the Anus*. He believed that anorectal diseases were difficult to treat. Located anus at the end of the visceral organs in the bottom of the body, being the fecal passageway of the rectum, and its high innervation were considered by Avicenna as the causes of this issue. He explained that in anorectal diseases, the constant passage of stool from the rectum may exacerbate disease and severity of pain. On the other hand, he believed that the application of drugs in this region is not easy, and drug absorption is low. Therefore, treatment is difficult [9].

DISCUSSION

Avicenna's classification of anorectal diseases was similar to current classifications. However he focused more on medical treatments of these diseases than on surgical options. In fact, Medieval surgical methods for anorectal diseases are discussed more in surgical treatises such as Albucasis's *al-Jiraha* (936-1013 AD) [34, 35].

Although the diseases mentioned by Avicenna are classified today as benign anorectal diseases, as Avicenna pointed out, they are not easily curable, because diseases such as hemorrhoids, fistulas, and abscesses are accompanied by a relatively high recurrence rate and considerable complications after surgery [36-38]. Of course, today's surgical advancements have revolutionized the treatment of these anorectal diseases.

Avicenna's reasoning for the treatment of anorectal diseases being difficult seems logical; however, his idea that rectal drug absorption is poor has been disproved nowadays [39].

Today, despite of Avicenna's classification, hemorrhoids are classified according to their origin. External hemorrhoids originate distal to the dentate

line, and internal hemorrhoids originate proximal to the dentate line. Internal hemorrhoids are also classified into four grades. In first-degree hemorrhoids, the hemorrhoidal lumps herniate into the anal lumen, but do not protrude outside the anus. Second-degree hemorrhoids may herniate from the anus and be visible during defecation and evacuation, but spontaneously decrease within the anal canal. Third-degree hemorrhoids require manual reduction, and fourth-degree hemorrhoids are irreducible[40]. A variety of anorectal disorders, such as anal cancer, condyloma, and Crohn's disease are considered as differential diagnoses of hemorrhoids[40]. These aforementioned diseases were not clarified by Avicenna, and he pointed to the rectal ulcer as a differential diagnosis only. Today, optional treatments for haemorrhoids include topical and systemic drugs, and surgery, depending on the grade of the hemorrhoids. Surgical treatments are usually reserved for grade 3 and 4 hemorrhoids[41]. However Medieval physicians such as Avicenna focused more on medical treatments of haemorrhoid than on surgical options due to the high risk of surgery in that period of time.

As mentioned by Avicenna, fissure and hemorrhoid surgeries can lead to the abscesses formation [43]. However the association between anal abscesses and fistulas is another point left quite understudied by Avicenna. An anorectal fistula is the late presentation of an anal abscess. An anal fistula connects the anal abscess from the infected crypt glands to the skin[43]. Drainage of anal abscesses is now an important part of treatment[4], but phlebotomy or *Fasd* that was used by Avicenna to treat abscesses has no usage today.

It is interesting that Avicenna's method for detecting fistula tracts still applies today with the added help of anesthesia to control pain during the examination. Procedures that are performed with seton to treat fistulas today were performed by Avicenna with plaited hair. Avicenna had warned that incontinency may be a complication of fistula surgery, and today, incontinency is still a major complication of fistula surgery[44].

CONCLUSION

Despite the great progress in current proctology, especially in surgical treatments of anorectal diseases, Avicenna's views on the classification and diagnosis of anorectal diseases have few fundamental differences with our modern-day knowledge. Many herbs that were used in the treatment of these diseases by Avicenna have anti-inflammatory, anti-microbial and anti-oxidant effects. Therefore, the knowledge of medieval physicians can be scientifically investigated even further to develop new therapeutic options for anorectal diseases.

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SAŽETAK

Premda nam je razvoj moderne medicine pomogao bolje negoli je to bilo u prošlosti detektirati i tretirati bolesti, napose u polju kirurgije, povijest bi medicine mogao biti okidač koji nam može pomoći u korištenju zanemarenih aspekata prijašnjeg znanja, a za unapređenje suvremene znanosti. Budući da su povijesni tekstovi koji se usko fokusiraju na anorektalne bolesti rijetki, ali oni koji postoje sadrže kratku diskusiju u polju, ova studija nastoji detaljno prikazati Avicenin pristup anorektalnim bolestima. Zbog toga smo prikazali 17. poglavlje trećeg sveska Avicenina Kanona medicine, „O bolestima anusa“, i usporedili njegove poglede na klasifikaciju i dijagnozu te pristup anorektalnim bolestima s onima moderne proktologije. Avicena je detaljno raspravljao o anorektalnim bolestima kao što su hemoroidi, rascjep (fisura), perianalni apsces i kanal (fistula), rektalni prolaps, fekalna inkontinencija i analni svrbež. U nastavku predstavljamo trave koje je Avicena koristio za tretiranje spomenutih bolesti. Naše istraživanje pokazuje da Avicenini pogledi na klasifikaciju i dijagnozu te pristup anorektalnim bolestima imaju malo fundamentalnih razlika s modernom medicinom. Zatim su dokazani farmakološki efekti nekih trava koje je preporučivao Avicena i koji se koriste u sadašnjoj medicini. Dakle srednjovjekovno znanje može biti dalje znanstveno proučavano za razvijanje novih terapijskih mogućnosti za anorektalne bolesti.

Ključne riječi: bolesti anusa; Avicena; Kanon medicine; povijest medicine; proktologija; rektalne bolesti; tradicionalna perzijska medicina