



# A Comparison Between the Al-Qanoon Fi al-Teb Principles in Dental Treatments and Contemporary Dentistry

Noushin Jalayer Naderi\*



## Abstract

**Background:** Reviewing the golden age of Persian traditional medicine reveals boundless descriptions of biologic, anatomic and therapeutic details of diseases. Avicenna's *al-Qanoon fi al-Teb* is a precious traditional book on medicine that contains definite explanations about treatment of oral disease.

**Objectives:** The aim of this study was to summarize the Avicenna's point of views on the treatment of dental disease in comparison to modern dentistry.

**Methods:** The major topics of dentally related parts of *al-Qanoon fi al-Teb* were reviewed and compared with modern contemporary dentistry.

**Results:** Very interesting similarities were found between Avicenna's methods and contemporary dental therapies. This study documented that Avicenna's perspectives are great sources for further investigations in dentistry.

**Conclusions:** This research reveals unstudied parts of Avicenna's methods in dental treatments.

## \*Correspondence to

Noushin Jalayer Naderi,  
Department of Oral and  
Maxillofacial Pathology, Faculty  
of Dentistry, Shahed University  
Tel: +982188959210,  
Fax: +982188967618,  
Email: jalayer@shahed.ac.ir

**Keywords:** Avicenna, Medicine,  
Persian medicine, *Al-Qanoon  
fi al-Teb*

**Received** March 4, 2018

**Accepted** June 10, 2018

**ePublished** June 15 2018

Citation: Jalayer Naderi N. A comparison study between the Al-Qanoon Fi al-Teb principles in dental treatments and contemporary dentistry. Avicenna J Dent Res. 2018;10(2):54-56. doi: 10.34172/ajdr.2018.12.

## Background

Modern dentistry is founded upon several devices and chemical components to save damaged teeth. The most widely used devices in modern dentistry belong to 19th and 20th AD. The operative and reparative dental materials are chemical-based agents that are manufactured from different metals and polymers. Modern dentistry is expensive with time consuming procedure (1,2).

Avicenna (980-1037 C.E.), the genius Persian physician, was one the pioneers in medicine. Avicenna's *Canon of Medicine* is a precious medical book that contains different descriptions in treatment fields of oral diseases. In the 12th century, *Canon of Medicine* translated into Latin and for many centuries has been used in universities (3,4).

Reviewing the golden age of Persian traditional medicine reveals great descriptions of biologic, anatomic and therapeutic details of diseases (5-7). These documents provide a great source for further investigations in dental therapies. Persian traditional dental treatments can potentially be good substitutes for modern dentistry. The aim of this study was to summarize Avicenna's point of views on the treatment of dental disease in comparison to modern dentistry.

## Methods

The major topics of dentally related parts of Avicenna's *al-Qanoon fi al-Teb* were reviewed and compared with modern contemporary dentistry. Different items including physiology, diagnosis and treatment were

## Highlights

- ▶ The research reveals unstudied parts of Avicenna's methods in dental treatments.
- ▶ Persian traditional dental treatments can potentially be a good substitutes for modern dentistry.
- ▶ Tempers were an important subject in Persian traditional medicine that ignores in modern dentistry.

reviewed and compared with modern principles.

## Results

Interesting similarities were found between Avicenna's methods and contemporary dental therapies. Avicenna's descriptions of teeth structure and prescriptions open a new approach in research. These principles can potentially be a less hazardous and cost-effective substitute for modern dentistry. In Avicenna's medicine, dental treatments have physiologic and anatomical basis. The biologic knowledge of Avicenna is compatible with modern medicine. Accordingly, treatment methods can interestingly be a valuable source for pharmaceutical research. Tempers were an important favored subject in Persian traditional medicine. Surprisingly, modern medicine ignores this topic. In Avicenna's description of dental problems, viscous septum and warm temper are related to fixed pain and pain produced under compression, respectively. Considering these points will help the researchers in understanding the biologic

<sup>1</sup> Department of Oral and Maxillofacial Pathology, Faculty of Dentistry, Shahed University

principals of treatments issues.

## Discussion

### Anatomical Definition of Tooth

According to Avicenna's description, "tooth is a bone that feels the senses by soft nerves". The modern histology reveals that the bulk of each tooth forms from highly mineralized enamel and dentine. This is compatible with bone in the description of Avicenna. These mineralized structures cover dental pulp. The pulp is a specialized connective tissue that is heavily innervated (8). This is compatible with "feels the senses by soft nerves". Without using a microscope or related instruments, Avicenna's description of tooth structure is surprisingly very exact.

### Causes of Toothache

Avicenna categorized the causes of dental pains. Based on his description, toothache occurs through swelling the radicular nerves, gum looseness and sagging of gum. The descriptions are compatible with periapical inflammation, gingivitis and periodontitis in modern dentistry, respectively.

Some of the described symptoms by Avicenna are unexpectedly in agreement with modern explanations. "Inflammation causes from essence of tooth" was Avicenna's viewpoint about pain. The exhibition of explained symptom is toothache. This description is in agreement with the recent description of pulp necrosis (9). Based on Avicenna's explanation, transient diffuse pain is caused by inflammation and stable pain originates from viscous septum. The explanations are compatible with reversible pulpitis and irreversible pulpitis in modern dentistry, respectively (10).

### Pain Relief

Treatment of toothache in *Canon of Medicine* is comprised of both technical and herbal aspects.

*Anacyclus pyrethrum*, locally known as akarkara, is a plant native to India and Arab countries with pain relieving effect. *A. pyrethrum* has been used to prevent the tooth decay progression by Avicenna (11).

Our previous in vitro study showed that the *A. Pyrethrum* extract had an antibacterial effect on *Streptococcus sanguinis* (12).

This finding is compatible with the traditional use of *A. pyrethrum* in the treatment of tooth decay. It seems that besides pain relief, the antibacterial effect of *A. pyrethrum* has been unconsciously applied in traditional medicine.

Endodontic treatment is the basic method to save necrotic teeth. Using a typical set of instruments, debridement of necrotic pulp is completed. File, reamer and barbed broach are manually operable instruments used for cutting and shaping the root canals. Generally, these instruments are very thin narrow pointed cylindrical shaped stainless steel tools. Identically, the root canal instruments are handled needle tools (9).

Avicenna's technique for discharging the necrotic tissue and saving a dead tooth was very remarkable. In Avicenna's described method, after accessing a hole on tooth head (compatible with occlusal surface), soft tissue of pulp was burned with glowed sack maker needle alone or along with boiled olive oil (11).

Avicenna identified the technique as branded method. Applying boiled olive oil and glowed sack maker needle, the pain dissolves and necrotic tissue dispels. Using sack maker needle is an ancient counterpart utilization of fine instruments in modern endodontic treatments. Using paste and wax, the gingiva and teeth were protected from burning. This is compatible with rubber dam, a plastic shield used around troublesome tooth for protecting the patient from aspiration of instruments and irrigating solutions (9).

### Tooth Decay

According to Avicenna, the undesirable dampness, putrefaction of tooth, is the etiologic effect of dental caries (11).

According to recent researches, penetration of caries bacteria to enamel and dentin, demineralization of mineral components and destruction of collagen fibers initiate the dental decay process. In deep caries, proteolytic organisms appear and decay progresses. Breached dentinal tubules, necrotic debris and proteolysis produce a necrotic mass in dentin with liquefaction focus (13). The liquefaction focus is compatible with Avicenna's definition of decay.

The modern dentistry benefits different instruments for protecting the teeth from devastating. The procedures are completed by different devices comprising of high speed rotary cutting instruments. Prepared surfaces are filled with different materials ranging from resin-based materials, amalgam alloys, glass ionomers, and liners to varnishes. Biocompatibility of dental materials is a great concern in dentistry. Dental materials are expensive and needs special care to produce. For years, the biocompatibility of dental materials was tested for crucial biological response of tissues (14). The herbal mixture can potentially be a good substitute for modern dental materials.

Avicenna's standpoint about treatment of caries was "prevention of dental disintegration, elimination of bad essence and eradication of caries source". Using dry anti-caries absorbent agents is an important keynote in Avicenna's prescription. *Pistacia lentiscus* L., *Myrtus communis* and *Nigella sativa* are the aforementioned herbs in the treatment of tooth decay (11).

*Pistacia lentiscus* L. is a native herb of Mediterranean climate regions. The antibacterial effect of *P. lentiscus* L. on dental caries and periodontal pathogens has been shown in previous studies (15,16).

The findings are in agreement with Avicenna's prescription of *P. lentiscus* L. in the treatment of dental caries.

### Tooth Discoloration

Dental stains are colored deposits with different internal and external origins. Tooth stains are aesthetic problem and need management. The polishing instruments and abrasive systems are routine medical treatments of dental stains. Polishing paste contains abrasive materials in different grits (17).

Correspondingly, Avicenna described a similar method for eliminating dental stains. Applying a weared abrasive glass was Avicenna's recommendation for removing dental stains. This is compatible with using a polishing paste. The polishing pastes regularly contain pumice, a dust form of a volcanic rock.

Avicenna prescribed a mixture of *Piper*, *Mentha pulegium*, *Aristolochia* and *Ferula assa-foetida* for treatment of internal staining (11).

Teeth stains commonly originate from pulpal bleeding. In contemporary medicine, bleaching or pulpectomy are treatments of choice for internal pulpal bleeding (9).

Using chemical materials are facing toxic effects and uneconomical. Using Avicenna prescribed mixtures open a new field in studying the novel substitutes for contemporary medicine.

### Tooth Extraction

Tooth extraction is a painful treatment. Nowadays, dentists fight with pain by applying anesthetic drugs. In spite of available effective drugs, removing tooth from alveolar socket is still unfavorable.

What was Avicenna's maneuver for defeating the pain of tooth extraction? "*After cutting the tooth tissues by lancet, rub mashed honey, solidified compound of Anacyclus pyrethrum and blackberry root in vinegar, on tooth apex 3 times or use Anacyclus pyrethrum in vinegar (stored under the sun for 40 days) on tooth apex for 1 to 2 hours. Employ wax around the tooth, thereafter, extract the tooth*".

In another interesting recommendation, matured *Urtica* seed with *Ficus carica* leaf are named as tooth destructive herbs (11).

These methods and herbs are not compatible with modern dentistry. They can potentially be an intriguing field of research.

### Enamel Abrasion

Enamel abrasion is a prevalent event. Incorrect and improper tooth brushing are common causes of enamel abrasion. The abraded tooth is sensitive to thermal changes. Glass ionomer cements are routine treatments of enamel abrasion in modern dentistry (18).

Avicenna prescribed *Laurus nobilis* and *Aristolochia* for cold temper and *Camphor*, *Santalum album* in *Plantago psyllium*, and *Portulaca oleracea* mixed in *Rosaceae* oil for warm temper of tooth abrasions (11).

The enamel abrasion is a common problem in general

population. Treatment of enamel abrasion is high cost and time consuming. Using tempers related herbs may be a useful substitute for contemporary treatments.

### Conclusions

Persian traditional medicine is a large-scale extensive ground for research in dental treatments. This research reveals unstudied parts of Avicenna's methods in dental treatments.

### Ethical Statement

Not applicable.

### Conflict of Interest Disclosures

The authors declare that they have no conflict of interests.

### References

1. Shen JZ, Kosmac T. Advanced ceramics for dentistry. USA: Elsevier; 2014.
2. Taub PJ, Patel PK, Buchman SR, Cohen MN. Ferraro's fundamentals of maxillofacial surgery. 2nd ed. USA: Springer; 2015.
3. Nasser M, Tibi A, Savage-Smith E. Ibn Sina's Canon of Medicine: 11th century rules for assessing the effects of drugs. J R Soc Med. 2009;102(2):78-80. doi: 10.1258/jrsm.2008.08k040.
4. McGinnis J. Avicenna. Oxford: Oxford University Press; 2010.
5. Rhazes M. [Alhawi Alkabir fi al Teb]. 2nd ed. Lebanon: Dar Ehia Altorath Alarabi; 2002. [Arabic].
6. Tabari A. [Ferdos al Hekmah fi al Teb]. Lebanon: Dar Alkotob Alelmyah; 2002. [Arabic].
7. Alahwazi A. [Kamil al Senaah al Tebyah]. Iran: Islamic Organization of Islamic Medical studies; 2003. [Arabic].
8. Nanci A. Ten Cate's Oral Histology: Development, Structure, and Function. 8th ed. Canada: Elsevier; 2013.
9. Hargreaves KM, Berman LH. Cohen's Pathways of the Pulp. 11th ed. Canada: Elsevier; 2016.
10. Neville BW, Damm DD, Allen CM, Chi AC. Oral and Maxillofacial Pathology. 4th ed. Canada: Elsevier; 2016.
11. Sharafkandi A. In translating Ganon, Abu Ali Sina (Author). 5th ed. Tehran: Soroush; 2004. [Persian].
12. Jalayer-Naderi N, Niakan M, Khodadadi E. Determination of antibacterial activity of *Anacyclus pyrethrum* extract against some of the oral bacteria: an in vitro study. Shiraz Univ Med Sci. 2012;13(2):59-63.
13. Garg N, Garg A. Textbook of Operative Dentistry. 2nd ed. New Delhi: Jaypee Brothers Medical Pub; 2013.
14. Sakaguchi RL, Powers JM. Craig's Restorative Dental Materials. 13th ed. US: Elsevier; 2012.
15. Koychev S, Dommisch H, Chen H, Pischon N. Antimicrobial Effects of Mastic Extract Against Oral and Periodontal Pathogens. J Periodontol. 2017;88(5):511-7. doi: 10.1902/jop.2017.150691.
16. Jalayer-Naderi N, Niakan M, Mohamadi-Motlagh M. Determination of antibacterial activity of pistacia lentiscus methanolic extract on *Staphylococcus aureus*, *Streptococcus mutans*, *Streptococcus sanguis*, *Pseudomonas aeruginosa*. J Ilam Univ Med Sci. 2015;22(7):67-74. [Persian].
17. Newman MG, Takei HH, Klokkevold PR, Carranza FR. Carranza's clinical periodontology. 12th ed. US: Elsevier; 2015.
18. von Fraunhofer JA. Dental Materials at a Glance. 2nd ed. England: Wiley-Blackwell; 2013.