

A Momentous Review Study on Concept of Dentistry in Ayurveda in the Purview of *Rachana Sharir (Human Anatomy)*

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Review Article

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Abstract

Ayurveda is the antique system of medicine. In recent years there have been renewed interest in developing and exploring in the depth of this science. In *Ayurvedic* text the value of health has been elucidated by *Acharya* by explaining about *Dinacharya*, *Rutucharya*, etc. One among them is oral hygiene but these have been explored in the present clinical practice of *Ayurveda*. *Acharya Sushruta* has considered *Danta* as one of the types of *Asthi*, specifically name it as *Ruchakaasti*. In *Ayurveda* we get reference in *Sushruta Samhita* regarding structural and functional information of teeth and its associate parts.

Dentistry has gained more recognition because of its cosmetic values. Moreover the pain and discomfort caused by *Dantarogas* affects the whole physiology of body by concentrating pain. In ancient classics literature regarding Dentistry and Oral Hygiene has been available like healthy teeth, care of the teeth and gums, as well as general oral hygiene, but information is scattered in different books. There is concrete need for comprehensive literary study of the anatomical and clinical aspects of dentistry, from the available *Ayurvedic* literature. Present review article can be useful to know that the concept of dentistry was well known to *Ayurveda* with its basic physio-anatomical knowledge. This article is a collection of data regarding dentistry from all *Ayurvedic Samhita* to give a detailed description of ancient knowledge about dentistry. This article also highlights the review about formation of teeth, anatomy of teeth and dental problems with scientific analysis of the *Ayurveda* dental health.

Keywords: Dentistry; *Danta*; *Dantarogas*; *Ruchakaasti*; *Asthi*; *Ayurveda*

Introduction

The Vedic literatures are considered as the oldest and the most authentic treasure of knowledge to the mankind yet available. Our holy sages has explored and described the Indian medical science with vivid and vast details. They have described thousands of Indian herbs and remedies in dental and medical fields. *Danta Shastra* is as old as medicine in ancient India. In pre Vedic period scattered information regarding dentistry (*Danta Shastra*) is found here and there. In pre Vedic period there are references like *Adideva Ganesha* is known as *Ekadanta*, to protect Bhoomi(Earth), *Bhagwan Varaha* lifted the Earth on his teeth and also *Ashwini Kamara* "physician of God have repaired teeth for pooshana.

Dentistry in Vedic Period

In *Garuda Purana* references of tooth bleaching agents like *Jati*, *Haratala*, *Yavakshara*, *Raktachandana*, *Hingula*, *Laksha*, has been quoted. They have advised to apply the paste of these substances on *Danta* followed by *Gandusha* with *Haritaki kashaya* which removes *Danta* mala and makes tooth white and lustrous. In *Atharva* Veda references are found where the medicine killed all those germs which have entered between the teeth.

Samhita Period

Acharya Sushruta (600BC) considered and Honored as universal father of surgery invented about 1000 surgical f of all sorts. He has described many details about diseases of mouth, oral cavity and throat in *Nidana Sthana* chapter. After describing different types of *Bhagna* (fracture), *Acharya Sushruta* begins describing the diseases of mouth; *Dalhana* has passed further comments over this subject. The last 15th chapter of *Nidana Sthana* after describing the fracture *Acharya Sushruta* commences describing causes, signs, symptoms of the diseases of mouth [1,2]. In last verse it has been said that *Ruchaka* bones (teeth) are broken and they are situated in oral cavity so the diseases required being described [3]. In *Astanga Sangraha Uttara Sthana* 26th chapter, has described that rituals and sacrifices to be made when child is born with *Sadanta*. In *Skanda Purana* among 1000 names of the river Ganga, *Danta* (478) is one of them. Pierre Fauther in 1728 has described many aspects of dental health, he condemned the use of horse hair to avoid damage to teeth and gums, similarly gingivitis or inflammation of the gums is sub acute or chronic condition which is usually caused by unhealthy and uncared teeth.

Excavation in Mesopotamia uncovered elaborate gold "tooth picks used by Sumerians about 3000 BC" the

primitive tooth brushes have been described for mouth cleaning in Chinese literature around 1600 BC. Similarly Buddhist had a "tooth strikes" for cleaning the teeth while ancient people used Meswakh in Arab countries. The Ebbys Papyrus has compiled about 1500 BC advocates for mouth wash and use of dentifrices for prevention of periodontal diseases. The writing of Hippocrates about 300 BC includes diseases of gums and treatment of unhealthy mouth.

Ayurvedic Review of Dentistry

Ayurveda, the science of life is traditionally considered as a supplement to Vedas, this is *Upaveda* of *Atharvaveda* [4]. It deals not only with healthy or unhealthy conditions of the body but also preaches about the wholesome and unwholesome dimensions in the field of social, religious cultural philosophical and other aspect of the life. Lord *Dhanvantari* divided *Ayurveda* in 8 parts which deals with different aspects of health, according to various parts of the body, among them *Shalakyia Tantra* is one which deals with diseases of supraclavicular regions in particular, it includes diseases of eyes, ear, nose, head and oral cavity. Among the *Samhita* which are available now, *Sushruta Samhita* gives wide description of the diseases of *Shalakyia Tantra*, a detailed description along the anatomy of *Mukha*, classification of the *Mukha Roga*, symptomatology, complications and management raised in *Sushruta Samhita*. Here an attempt has been made to compile the knowledge of ancient *Ayurvedic* scholars scattered in *Ayurvedic* texts, oral hygiene methods are also mentioned as a part of *Dinacharya* (daily routine). So as to present it systematically this is one of the requirements of present era. Anatomical description regarding *Danta* is not clearly explained in classics but scattered references are available in various treatises.

Nirukti (Creation) of Word Danta

According to *Sabdasthoma Nidhi*, and Sir MM Williams, word *Danta* is derived from the root "DAM" which when suffixed by "TAN" gives rise to the word *Danta*. The literary meaning of DAM is a tooth, tusk, fang (two long sharp upper teeth in snakes) and the literary meaning of TAN is Continuation, diffusion or propagation.

Synonyms of Danta

Danta, *Dashana*, *Dwija*, *Radana*, *Haru*.

Process of Dantotpatti (Formation of Teeth)

Acharya Kashyapa clearly describes that teeth are formed by the *Pachana* of *Asthi* and *Majja dhatu*, which reaches *Dantashaya* and originates after piercing the *Danta Mamsa* in both *Urdhwa* and *Adho Danta Mamsa* the

teeth erupt in same month corresponding month of intrauterine life in which the formation of the teeth begins.

Sr. no.	Name of <i>Danta</i>	<i>Dantotpatti Kaal</i> (Dentition Period)
1	Incisors (<i>Raja Danta</i>)	6 months- lower
2	Incisor (<i>Vasta</i>)	7-8 months upper
3	Deciduous 1st molar (<i>Hanvyā</i>).	10 months -1 year.
4	Deciduous canine (<i>Danstra</i>)	11 Month/2 years
5	Deciduous second molars (<i>Hanvyā</i>)	2- 2 and 1/2 years

Table 1: Shows the name of the *Danta* and its *Dantotpatti Kaal* (Dentition Period) according to *Ayurveda*.

Whereas there is another variety which comes one in life and remains for the whole of life further the month in which the tooth appears for the first time will fall in the same year as the month act which it appear and the permanent starts erupting . Dentition is one of the important landmark in accessing the growth and development of the child, however it has not been dealt in this perspective in *Charaka* and *Sushruta Samhita* [5]. *Vagabhata* have dealt mainly the complications arising during the dentition period, but in *Kashyapa Samhita* "*Dantajanmikiya Adhyaya*" mentioned about the eruption of the teeth and their abnormalities and treatment.

Danta Sankhya (Number of Teeth)

As to the real morphological character, of the teeth, the ancient Indian anatomist of course were uninformed they took them to the bone on account obviously of their hardness and probably also of their white appearance and because they were formed to remain in the skull after every vestige of other tissue had disappeared. As a matter of fact, they resemble compact bone in appearance and in composition, yet in reality, they are more closely allied to the hair, for both are the modifications of the papilla of the outer integument of the body. The tooth though intimately connected with the bony skeleton is really a calcified papilla of the mucous membrane. Totally there are 32 teeth, out of which is 8 are *Sakrutjata*, rest are called *Dwija*, the teeth are composed of *Asthi*, *Majja*, and hence its origin is from *Pitruja Bhava*. With reference to the number of teeth *Acharya Atreya* and *Dhanvantari* agree both states correctly to the number 32. *Atreya* school goes even so far as to count a corresponding number of the sockets. Accordingly the system of *Atreya* divides either alveolar processes into 32 alveoli or *Danta Ulukhala*, each of which is counted, in the lists as a

separate bone. *Vagabhata* agrees also with the *Acharya Atreya*.

Types of the Teeth

According to *Acharya Kashyapa* classification is of two types.

Depending on Location

Acharya Kashyapa has divided the teeth into two classes *Dwija* and *Sakrutjata* or *Swaroodha*. The term *Dwija* denotes that group of teeth which erupt twice or have four runners in deciduous dentition. They are twenty in number, *Acharya Kashyapa* in his *Kashyap Samhita* has also differentiated the teeth into upper middle two are named as *Raja Danta* on either sides of the *Raja Danta* are two *Vasta* i.e. lateral incisors .Lateral to this are two *Danstra* (canines) and ten *Hanavya* (premolars and molars)[6].

The numbers of teeth are symmetrical on either side of the mid plane in both of the jaw; they can be formulated as follows, *Rajadanta* - 2/2 , *Vasta* 2/2 , *Danstra* 2/2 *Hanavya* 10/10, 16 upper jaw / 16 lower jaw = 32. General formula, he has also stated a general formula regarding eruption of the teeth that as many as months are involved in the primary eruption of teeth that many years are to be concerned with the secondary eruption.

According to the Quality of Danta

Depending on the quality of teeth there were 4 types of the teeth explained in *Ayurveda*.

Samudga: *Samudga* means a joint with a socket just like a cup; these types of the teeth develop in the condition of *Kshaya* of child. These types of teeth fall early.

Samvrutta: These are inauspicious and remain dirty.

Vivrutta: This type of the teeth causes excessive salivation because these are not fully covered with the lips; these have many chances of diseases of the teeth.

Danta Sampat: Teeth are auspicious teeth having all the characteristics of healthy teeth. The teeth are normal, complete in number, equal, strong, white, dense, smooth, clean, healthy, slightly prominent, well developed and evenly placed in relation to each other. The gums are even pink smooth, strong, dense, steady, further *Acharya* described that the teeth which appear in 8th month will have all the symptoms of the *Danta Sampat*.

Pramana (Measurement) of Danta

Prakruta Danta is Two *Angula* in length. The *Moola Bhaga* of *Danta* is One *Angula* in length this is known as *Danta Moola* which is covered by *Danta Mamsa*. The exposed part of the *Danta* is known as *Danta Valkala* this is also One *Angula* in length.

Danta Swarupa (Structure): *Prakruta Danta* is covered by *Danta Mamsa*; it should be *Sthira*, *Ghana*, *Snigdha*, *Shweta* i.e. as white in color and *Sama* i.e. equal in size.

Danta Sharira (Anatomy of Teeth): *Danta* is considered as type of *Asthi* known as *Ruchakasthi*. *Acharya Dalhana* commented on *Ruchaka* as, *Dashanastu Rochakani* as it helps in *Ruchi Gnyana* (Taste sensation) [7-9]. *Danta* is also known as *Ruchakasthi*, and is variety of bony tissue. The word *Ruchaka* means that which imparts taste, and *Asthi* means bone thus the *Ruchaka Asthi* means bones associated with function of imparting taste.

Consideration of Danta as Asthi

Acharya Sushruta mentioned 300 bones in human being out of this 63 in the region above the neck, from that there are 32 under *Ruchakasthi*, further he has mentioned, roots have joint equal in number to that of the teeth, this joints named as *ulukhala* 36. Even *Charaka* mentioned that along with teeth and sockets of teeth, bones in the body are 360 in number (teeth 32 and sockets 32) while *Sharangadhara* considered *Danta* as *Upadhatu* of *Asthi* [10].

Danta Valka (Enamel): *Sushruta* has mentioned that outer covering of *Danta* as *Danta Valka* commenting on that *Dalhanacharya* has used *Danta Twak*.

Dantagra (Cutting margin of tooth): Description of *Dantagra* is available in context with the examination of health and hygiene of *Shishya* (student) and *Tanu Dantagra* is considered as *Shubha* in context to the *Shishya Guna Sampanna* (qualities of medical student). *Dantagra* is explained in relation to quality of *Brahmana*, *Kshatriya* or *Vaishya* endowed with qualities, clean, edge, nature, purity, good behavior having thin tongue, lips and tip of the teeth (lower margin) it is consider as *Shubha*.

Asthisara: In *Asthisara purusha Danta* are *Sthoola* and *Kathina* (hard) and in *Shukrasara Prakruti Danta* are *Shweta*, *Snigdha*, and *Kantinyukta*.

Dantya (wholesome teeth): *Danthyā (Dantyoḥyō hita)* is quoted in context to property of *Tila*. *Adhidanta* (super nummery teeth is one of the *lakshana* of *Asthi Vruddhi Lakshana*. *Acharya Madhava* stated that *Maladhya* or

accumulation of food over the teeth (tarter). *Mala* on *Danta* is the *Poorva roopa* of *Prameha*. *Sharangadhara* in *Samhita* considered *Danta* as *Mala* of *Asthi Dhatu*. *Acharya Bhela* in his *Samhita* considered that *Danta* is said to be one of the structure which is hard tough and made of *Prithvi mahabhoota* [11].

Asthi Kshaya Lakshana and Danta: *Acharya Charaka* quoted that *Danta* also one among the *Asthi Kshaya Lakshana*. Here *Asthi Kshaya* actually means decrease in qualities of the bone and not in number. Hardness (*Kathinya*) is chief property of the bone and their softness (*Mrudutwa*) should be taken as *Asthi Kshaya* [12].

Danta Moola: *Sushruta* while explaining *Danta* and *Dantamoolagata Roga*, he classified the disease concerned to gums as *Dantamoolagata Roga* and in relation to symptoms of different disease the *Danta Moola* gives the meaning of *Danta Mamsa* or *Danta vesta* and other context as a cavity of teeth.

Danta Veshta: It is derived from two words *Danta* and *Veshta* it means gums, in *ayurvedic* classics the term *Danta vest* denotes two meanings i. e. an organ and a disease. *Danta vest* is defined as flush which covers the teeth. *Danta Veshta* is characterized by secretion of pus and blood from the gums (pyorrhoea) in relation to *Dantamoolagata Roga*.

Paryaya (synonyms)

Danta Moola, *Danta Mamsa*, *Danta Vesta*, *Danta Vestaka*, *Danta Bandhana*.

Embryological Development

Danta Veshta is developed from *Rakta Dhatu* in uterine life, after birth they grow in shape and get strengthened.

Dantavikruti

Congenital Anomalies (anomalies of teeth)

Teeth may be abnormal in number, size, shape, placement, color or quality; their anomalies are enumerated as given below:

Anomalies of Teeth

(A) Number of teeth:

- *Danta Abhava* - Absence of teeth i.e. Anodontia.
- *Heena Danta* - Less number of teeth i.e. partial Anodontia.
- *Adhika Danta* - More number of teeth [13,14]

(B) Size of teeth:

- *Vishaladanta*- Large teeth i.e. Megalodontia / Macrodonia
- *Hraswadanta* – Small teeth i.e. Microdonia

(C) Placement of teeth:

- *Virala Danta* – lot of space between adjacent
- *Karala Danta* – irregular teeth
- *Vardhana* or *Adhi Danta* or *Khallivardhana*– Supernumerary teeth.

(D) Color of teeth:

- *Vivarna Danta* – Discoloured teeth
- *Shyava Danta* – Blackish teeth

(E) Quality of teeth:

- *Bhangura Danta* - Fragile teeth
- *Samudga Danta* – Worn out teeth

Danta Roga: (Disease of the teeth)**Dhalana**

When there is frequent crushing pain with severe distress, it is known as *Dhalana* caused by *Vata*. According to *Vagbhata* mentions both *Sitakya (Dhalana)* teeth tolerant to hot things, causing more discomfort by touch of cold things feels like splinting because of pain known as *Sitakya* or *Dhalana* caused by *Vata* [15,16].

Krimidanta

In *Krimidanta* the tooth is black with loose cavity, discharge, swollen and severely painful pain appearing without any apparent cause; it is caused by *Vata*.

According to *Vagbhata*, *Vata* is predominant invading the tooth along with its roots dries up the marrow inside and causes the waste product of food to fill up the cavity due to putrefaction, setting in minute invisible worms develop there.

Danta harsha: (Hyperesthesia of teeth)

If the teeth do not tolerate, cold and hot and any other touch it is known as *Danta Harsha* caused by *Vata*. *Vagabhata* opines that teeth becomes incapable to tolerate air, eating sour and cold things, feels painful as though shaking. This is produced by eating too much of sour things only.

Bhanjanak: (Fractured tooth)

Bhanjanak is a disease caused by *Kapha* and *Vata* in which face gets distorted and teeth cracked with severe pain, but *Vagbhata* has not mentioned it.

Sharakara: (Tartar)

When gravel like diet is deposited and fixed on the teeth, destroying their normal qualities it is known as *Danta Sharakara* (Tartar). according to *Vagbhata*, *Kapha* accumulates on the teeth and gets dried up by *Vata* due to non cleaning leading to bad smell this is known as *Sharakara*.

Kapalika: (Non vital teeth)

When enamel of teeth gets cracked with gravel, it is known as *Kapalika*, which destroys the teeth. According to *Vagbhata*, when *Danta Sharakara* is neglected leads to falling out loosening of the crown of teeth, it is known as *Kapalika* [17].

Shava Danta: (Discolored teeth)

When enamel of teeth gets cracked with gravel, it is known as *Kapalika* which destroys the teeth. *Vagbhata* also opines the same.

Hanumoksha: (Dislocation of the jaw)

The Temporo-mandibular joint dislocated by *Vata* aggravated by respective etiological factor is known as *Hanumoksha*, i.e. dislocation of the jaw, characterized by symptoms of *Ardita* (facial paralysis) the disorder *Hanumoksha* included under *Dantagata Roga*.

Danta Sampat

Kashyapa is the only author who has mentioned Concept of *Danta sampat*.

These are auspicious teeth having all the characteristic of the healthy teeth; the teeth in the oral cavity should possess twelve characteristic features.

1. *Poornata*: completeness / number of teeth.
2. *Samata*: evenness / alignment
3. *Ghanata*: structure / compactness.
4. *Shuklata*; whiteness.
5. *Snigdghata*: unctuousness.
6. *Slakshana*; smoothness.
7. *Nirmalata*: cleanliness.
8. *Niramayata*: uncoated.
9. *Kinchidottara unnata*: slight protrubance of teeth

Danta bandana sampat: (Quality of gums)

1. *Samata*: evenness / alignment
2. *Raktata*: pink in color (coral pink)
3. *Snigdghata*: unctuousness.
4. *Bruhat Ghana sthira moolata* – It indicates strength and steadiness of gums.

Discussion

In *Ayurveda* dentistry is not a branch included in the Shalaky Tantra called *Dantha Swasthya* (in Sanskrit) is ground breaking and differs with each person's health and climatic changes resulting from celestial influence. Dentistry is a branch of medical science, upholds the principles of oral hygiene. Since antiquity, tooth extraction stood as a greater challenge in this field because of the complexity and risks involved in the management of pain and post operative complications as sepsis etc. In the present day the branch has evolved to a greater extent due to the sophistication and advancement in the field of medical technology. In *Ayurvedic* text the value of health has been elucidated by *Acharya* by explaining about *Dinacharya*, *Rutucharya* etc. One among them is oral hygiene but these have been explored in the present clinical practise of *Ayurveda*. *Acharya Sushruta* has considered *Danta* as one of the types of *Asthi*, specifically name it as *Ruchakaasti*. In *Shalaky-Tantra*, varieties of oral diseases arise in different anatomical sites such as the lips, alveolar margin, the teeth, tongue, on the palate, in the oropharynx and in generalized form.

Acharya Kashyapa enumerates the types of teeth (*Rajadanta*, *Vasta*, *Danstra*, and *Hanavya*.) along with number of milk and stable teeth as 20 and 32 respectively. Few other authors also give some descriptive material about dentistry but not enough to give elaborate descriptions. Total teeth are 32 in number and names of various teeth have been given by *Kashyapa*. The middle two teeth are *Rajadanta* (incisors) and are considered sacred. Teeth by the side of *Rajadanta* are called *Vasta* (canines) and other teeth by the side of it are called *Danstra* (pre-molar). The rest are called *Hanavya* (molar) and named because are helpful in mastication. Formation, eruption, growth and development, fall, their strength and weakness all depends on certain factors like race, nature, maternal and paternal factors (hereditary) and acts of past life. Time of eruption and shedding of primary teeth's and eruption of permanent teeth given *Vagbhata* and *Kashyapa* is similar as modern anatomist and dentists.

The concept of *Vagbhata* regarding genesis of teeth is more precise to the current science. He opines that *Dhatubija* is basically responsible for further development of teeth. Development of teeth is a continuous process, but it is usually divided into stages such as bud, cap and bell stages. Impediment of tooth appearing in different months is described by *Kashyapa* and he told eruption of teeth in 8th month will have all the qualities of a healthy tooth. For *Sadanta Shishu* (child born with teeth), in modern literature considered that

presence of teeth at birth may be part of the normal dentation these teeth are termed as 'Natal Teeth' and observed in approximately one in 2000 newborn infants. Presence of natal teeth may also be due to congenital syphilis. Infants having natal teeth produce maternal discomfort due to the abrasion or biting of the nipple during feeding quoted by *Acharya Vangasena*.

Anodontia is also described by *Vagbhata* he opines that the *Vayu*, situated in gums gets vitiated, either by itself or with the help of *Pitta*, dries up *Asthi* and *Majja* [18]. Because *Asthi* and *Majja* are chief component of teeth, therefore, by drying these, there is no eruption of teeth. *Vangasena* has considered that only *Vayu* is responsible for drying the gums. *Vagbhata* (A.H) mentioned the recipes for easy and painless eruption of teeth (detail as above); similarly *Yogratnakar* and *Vangasena* also described these recipes.

Kashyapa has mentioned that healthy teeth will have completeness, whiteness unctuousness, smoothness, cleanliness, in a disease-free state with a slight protuberance of upper ones. Evenness, redness, unctuousness and completeness of gums with big, compact and stableness of root are the best qualities of teeth. Thus, Dentistry concerned with the diagnosis, prevention, and treatment of diseases of the teeth, gums, and related structures of the mouth and including the repair or replacement of defective teeth was explained. Ancient scholars *Charaka* and *Sushruta* has not given complete information regarding dentition, but *Acharya Vagbhata* gives useful information about dentation and dental problems, including dental disorder and its treatment. *Acharya Kashyapa* is the initiator of this field. He gives more informative data about formation of teeth, milk tooth and permanent teeth. He also described the dental problems and dental disorders in detail.

Conclusion

Concept of dentistry was fully developed and well practiced in ancient *Ayurveda*. *Acharya Kashyapa* gives the detailed explanation on anatomical and clinical aspects of dentistry such as dentition, types of teeth, structure of teeth, and significance of them along with non-occurrence of teeth. This description is quite similar to modern dentistry. *Acharya Vagbhata* has also gives some valuable information about dentistry like, development of teeth, anatomy of teeth, pathogenesis and different disease conditions related to teeth. *Acharya Vangasena* has also gives few important thoughts related to dentistry. Thus, anatomical information of dentistry such as types of teeth, structure of teeth, pathological conditions and its

management through *Ayurveda* all are very valuable information explained in *Ayurvedic* classic.

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