

**DANTASHARKARA W.S.R TO DENTAL CALCULUS AND ITS  
AYURVEDIC MANAGEMENT: A CONCEPTUAL STUDY****Dhara Makwana<sup>1\*</sup>, Shreyas Bhalodia<sup>2</sup> and Hardik Chudasama<sup>3</sup>**

<sup>1</sup>Assistant Professor, Department of Shalakya Tantra, Murlidhar Ayurved College,  
Rajkot Gujarat, India.

<sup>2</sup>Associate Professor, Department of Rachana Sharir, Global Institute of Ayurved,  
Rajkot Gujarat.

<sup>3</sup>Assistant Professor, Department of Kriya Sharir, Murlidhar Ayurved College,  
Rajkot Gujarat.

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**\*Corresponding Author****Dhara Makwana**

Assistant Professor,  
Department of Shalakya  
Tantra, Murlidhar Ayurved  
College, Rajkot Gujarat,  
India.

**ABSTRACT**

*Dantasharakara* can be compared to Dental calculus which is considered one of the major cause of dental problems. It occurs in the majority of adults worldwide. 97.1 million Persons worldwide have Dental Calculus. It is a hard deposit which is the consequence of mineralization of dental plaque, and it is generally covered by a layer of unmineralized plaque. From the *Ayurvedic* point of view, *Dantasharkara* is itself presenting symptom of it i.e., Collection of *Sharkara* (Sand like particles) around teeth surface in addition of *Putigandha* (Halitosis). According to Ayurveda *Kapha* and localized *Mala* are dried by *Vata* and *Pitta*; which eventually converts into hard, rough, and rock like *Dantasharkara*. After removal of *Dantasharkara*

*Kaphaghna*, *Lekhana*, *Shodhana*, *Ushna Virya* drugs, are to be used in The management of *Dantasharkara* along with preventing to recurrence An effort has been being made in present work to explore the probable pathophysiology of *Dantasharakara* and its management and prevention of recurrence.

**KEYWORDS:** *Dantasharkara*, Ayurveda, Dental calculus.

**INTRODUCTION**

Everyone loves a bright and nice smile with white evenly spaced teeth but not all are blessed with the perfect set of teeth. Dental appearance is an important feature in determining the

attractiveness of a face and thus plays a key role in human social interactions. Among the significant factors affecting overall dental appearance are tooth color, shape, and position; quality of restoration; and the general arrangement of the dentition.

In Ayurveda, *Asthi* is classified into five types.<sup>[1]</sup> Among them, *Danta* is considered as the one type of *Asthi* called *Ruchakasthi*.<sup>[2]</sup> But *Sharangadhara* considered it as an *Upadhatu* of *Asthi*.<sup>[3]</sup> Description about *Danta Shareera* is found in different ancient texts of Ayurveda. Description about the ideal teeth is mentioned in *Astanga sangraha*.<sup>[4]</sup> and *Astanga Hridaya*.<sup>[5]</sup> Regarding the ideal teeth set *Vagbhata* explains that it should be *Ghana* (Dense), *Snigdha* (shiny surface), *Shlakshana* (smooth surface), *Sita* (White) and *Sama* (in proper alignment). *Aacharya Kashyapa* considered these properties as *Dantasampat*. They are *Purna* (fully erupted tooth without any cracks or enamel faults like pits & fissures), *Sama* (all teeth in proper alignment), *Ghana* (Dense), *Shukla* (without any discoloration e.g. chalky white/ yellow/ brown/ black spot on tooth surface), *Snigdha* (shiny surface of teeth), *Shlakshna* (smooth & even surface without any abnormal ridges, attrition or erosion), *Nirmala* (without any food debris, plaque or stains), *Niramaya* (disease free), *Kinchituttarunnata* (slight protuberance of upper anterior ones) and also texted qualities of gums i.e. *Danta Bandhana Samata* (equal base of gums), *Raktata* (pinkish red gums), *Snigdha* (luster of gum) and *Bruhat Ghana Sthirmula* (broad, strong & stable gums).<sup>[6]</sup>

In Ayurveda, Dental health called *Danta Swasthya* is customized as per every person's *Prakriti* (Constitution) of each person and climate changes resulting from solar, lunar and planetary influences (*Kala- Parinama*). *Vata*, *Pitta*, and *Kapha* balance are important for a healthy life. When anyone of these *Dosha* vitiates, it affects *Danta Swasthya* (Dental health).<sup>[7]</sup>

Even though dentistry was not a separate branch in Ayurveda, it was included in its *Shalakya Tantra* branch which dealing with diseases of upper clavicle part. Problems such as deformities of the oral cavity, plaques, and infections were managed in ancient India. Traditional medicine can treat various infectious and chronic conditions. *Aacharya Vagbhata* and *Sharangadhara* has stated ten *Danta Roga* Besides *Aacharya Sushruta*, *Bhavprakash*, *Yogaratanakara* have narrated eight *Dant Roga*. *Dantasharkara* is also one of these *Dantaroga*.

Most people are not aware of dental diseases because usually, they are painless in the early stage. Dental diseases have a close relation with systemic diseases also.<sup>[8]</sup> Dental calculus is one of the very common dental disorders. There are two types of dental calculus i.e. supra-gingival and sub-gingival. (Picture 1) Dental plaque formed after eating, if not removed by brushing and flossing becomes calcified i.e. Dental calculus. It only takes 24 hours for the plaque that is not removed from teeth to turn into calculus. Avoidance of oral hygiene and faulty diet are cause for the formation of dental calculus. (Picture 2) Scaling is the first treatment for removal of dental calculus, simultaneously *Ayurvedic* classics also point out to remove *Dantasharkara* by scraping with proper care and not to damage to *Dantamool* (gingiva), thousands of years back! Several medicaments are explained for the strengthening of the teeth and gums and prevention of diseases.

Thus on the basis of *Hetu* (improper oral hygiene and diet) *Linga* (hardened dental plaque and halitosis) and *Aushadha* (Scaling), most *Ayurveda* scholars take *Dantasharkara* as dental calculus. In the present study, concepts have been tried to explain with reference to dental calculus.

**Aims and Objectives:** To study “*Dantasharkara*” in *Ayurvedic* and modern perspective.

### Definition

According to *Aacharya Sushruta*, it is a disease in which *Danta Mala* (plaque) formed on teeth gets hardened by the action of deranged *Vayu* and lies in a crystallized form at the root of teeth is called as *Dantasharkara*.<sup>[9]</sup>

According to *Aacharya Vagbhata*, accumulation of *Danta Mala* on teeth due to improper oral hygiene methods and *Kapha* gets dehydrated by *Vata* adheres to the teeth, becomes hard and emits bad odor is known as *Dantasharkara*.<sup>[10]</sup>

According to WHO, calculus is a form of hardened dental plaque. It is caused by precipitation of minerals from saliva and gingival crevicular fluid (GCF) in plaque on the teeth. Calculus can form both along with gum line, where it is referred to as supragingival calculus and within the narrow sulcus that exists between the teeth and the gingiva, where it is referred to as subgingival calculus [Picture 1].

According to Michael G. Newman: Dental Calculus consists of mineralized bacterial plaque that forms on the surfaces of natural teeth and dental prosthesis.<sup>[11]</sup>

### **Nidana**

Factors due to which the disease is induced are called *Nidana*. No separate and specific *Nidana* of *Dantasharkara* are mentioned in texts except *Adhavana*. *Acharya Vagbhata* and *Yogaratanakara* have described the *Samanya Nidana* of *Mukharoga*.<sup>[12,13]</sup> which includes excessive indulgence of meat of *Matsya* (fish), *Mahisha* (buffalo) and *Varaha* (skunk), soup of *Masha* (black gram), *Aam Moolaka* (unripened reddish), *Dadhi* (curd), *Ksheera* (milk), *Ikshu Rasa* (sugarcane juice), *Shukta* (vinegar), *Fanita* (a form of jaggery). *Avak Shayya* (habit of sleeping while lying on the abdomen), *Dwishato Danta Dhavanam* (avoidance of tooth cleaning). *Matsya Sevana* has not been mentioned in *Yogaratanakara*. In addition to all these *Acharya Charaka* has described that *Atisevana* of *Madhura*, *Amla* and *Lavana Rasa* produces various type of *Dantaroga*.<sup>[14]</sup> *Acharya Kashyapa* has also mentioned *Samanya Nidana* of *Mukharoga* under the heading of *Pratishyaya Nidana*.<sup>[15]</sup> *Nidana* mentioned here can be classified broadly in two types viz.

- **Aharaj Nidana:** - *Matsya Sevana, Atimamsa Sevana, Balamulaka, Masa, Dadhi, Kshira, Iksu, Sukta, Phanita, Madhura-Amla-Lavana Rasa Atisevana.*
- **Viharaj Nidana:** - *Avak Shayya, Danta Dhavana Dwesha.*

*Kapha* is the main *Dosha* associated in *Samprapti* of *Mukharoga* and especially *Dantasharkara*. *Aaharaja Nidana* and *Viharaja Nidana* in one or another way alters salivation or properties of saliva, which is the prime cause of calculus formation. Above all of them, *Danta Dhavana Dwesha* should be considered as the main culprit in pathogenesis, as debris accumulated due to not cleaning teeth or improper cleaning of teeth is converted into calculus as the end result.

### **Poorva Roopa**

Symptoms which occur prior to complete manifestation of particular disease are *Poorvaroopa*.<sup>[16]</sup> No specific *Poorva Roopa* has been mentioned for *Dantasharkara*. Lack of symptoms should be considered *Poorva Roopa* itself as *Acharya Charaka* has stated in *Vatavyadhi & Urahkshata*.<sup>[17]</sup> *Poorva Roopa Avastha* is the stage before *Vyakti* (fifth *Kriyakal*) or manifestation stage and as *Dantasharkara* can be correlated with Dental calculus, plaque and tartar formation can be considered as *Poorva Roopa* of *Dantasharkara*.

### **Roopa**

*Dantasharkara* itself is a presenting feature.

- *Sharkrev Sthiribhuto Malo Danteshu* (Calculus deposition on teeth).
- *Putigandhi* (Halitosis).

*Dantasharkara* is described as *Dantanam Gunahari*, in this way lack of *Dantasampata* due to this disease also should be taken as *Roopa* of *Dantasharkara*.

### ***Upadrava***

*Aacharya* has clearly mentioned disease coming behind if one ignores to treat *Danta Sharkara*, this condition is *Kapalika*.<sup>[18]</sup> It has been mentioned that if *Dantasharkara* is neglected it may result in the separation of *Dantavalkala* (external layer of tooth i.e. enamel). *Aacharya Sushruta* states that this condition results in the destruction of teeth (*Dashananam Vinashini*).

### ***Samprapti***.<sup>[19]</sup>

*Samprapti* is the process of manifestation of the diseases by the morbid *Dosha* circulating all over the body. *Samprapti* is the process, which takes place in the body from *Nidana Sevana* to the stage of *Roopa* of the particular disease. *Maharshi Sushruta and Vagbhata* have explained *Samprapti* of *Dantasharkara* in a very concise way. Unlike *Netra Roga* specific *Samprapti* has not been described for *Mukharoga*.

The pathological events begin with the increment of *Dosha* at their respective sites.

It is an attempt has been made to understand its *Samprapti* according to the '*Sat Kriyakala*'.

- 1) ***Samchaya***: *Samchaya* is *Svasthan Vridhdhi* of *Dosha*. *Aharaja* and *Viharaja Nidana* (etiological factors) i.e. intake of *Kaphaprakopa* and *Abhishyandi Aahara*, avoidance of oral hygiene or improper oral hygiene; lead to accumulation of *Kapha* and collection of *Mala* (food debris) in interdental space.
- 2) ***Prakopa***: When the provocative factors are not removed and *Nidana Sevana* is continued than the previously accumulated *Dosha* get provoked and they undergo the stage of melting and in turn, get ready to leave their original places. Due to *Kapha Prakopa* condition of *Mandagni* and *Aamajeerna* takes place.
- 3) ***Prasara***: In next *Kriyakala*, the provocative factors are still allowed to continue to irritate the *Dosha*, a stage of *Prasara* ensues. Vitiating *Dosha* makes their way towards the *Urdhwajatru* through *Sira* (*Vimargagamana*), *Vata* plays the chief role here. *Kapha Pradhana Vata-Pitta* is the key combination for *Dantasharkara* which enters the stage of

*Prasara*. *Ajeerna* condition is continuing in this stage also and it leads to altered salivary flow.

- 4) ***Sthanasamsraya***: Vitiated *Dosha* run through *Sira* towards *Urdhwajatru* and localize in *Mukha*; in the specific tissue or an organ i.e. teeth surface where '*Kha Vaigunya*' has taken place. This '*Kha Vaigunya*' is due to avoidance or improper method of oral hygiene, this leads to impaction of food debris. Due to *Sthanasamsraya* of vitiated *Dosha*, food debris and condition of local *Ajeerna*, *Sthanika Kapha Dosha* also gets vitiated. Ultimately these results in plaque formation. In this stage, the *Dosha* after getting their entry in the individual cell of the tissue or the organ affects the near normal function of that particular tissue or organ apparently. This stage of *Sthanasamsraya* is considered as the '*Purvarupa*'. Dental plaque can be considered as *Poorvaroop* of *Dantasharkara*. *Asthidhatu* (*Danta*) *Dushti* due to disease initiates from this stage.
- 5) ***Vyakti***: Accumulated *Mala* and *Kapha* are dried up by *Vata*, (*Aacharya Sushruta*, *Aacharya Vagbhata*) or *Vata & Pitta*.<sup>[20]</sup> (*Madhava Nidana*) and materialization of *Dantasharka* occurs. *Dantasharka* firmly attached to the teeth and It's also with the foul smell (*Halitosis*). It breaks down the normal qualities and beauty of teeth like *Shuklatva* (white shining appearance), *Dradhatva* (firmness) etc.
- 6) ***Bheda***: it is the stage of complications. Avoidance of disease *Dantasharkara* leads to the manifestation of other disease named *Kapalika*. It is the condition where the outer layer of tooth i.e. enamel is teared of, *Aacharya Sushruta* describes this condition as, '*Dashananam Vinashini*'.<sup>[21]</sup> In addition to this modern science states that with dental calculus, gingivitis is associated in almost all cases.

## Treatment

### According to *Aacharya Sushruta*

- *Dantasharkara* tends to demolish the healthy growth, functions, and qualities of teeth. Two procedures have been mentioned, first It should be removed in such a way that it does not hurt the roots of the teeth and then *Pratisarana* (gentle massage over the tissues i.e. teeth and gingiva) with *Laksha Churna* and *Madhu* (honey) should be done.<sup>[22]</sup>
- Treatment advised for *Dantasharka* should also be followed.<sup>[23]</sup>

According to *Aacharya Vagbhata*:

- *Dantasharkara* should be scraped (*Lekhana*) without injuring the gums and then it is anointed (*Sechana*) with *Kshara Taila*. Powder of *Musha* (crucible), *Kurpa* (a kind of glue) and bark of *Patali* should be applied as *Pratisarana*.<sup>[24]</sup>



- It is important to prevent reformation of *Dantasharkara*. So *Aacharya Vagbhata* has advised to do *Dantadhavana*, *Jihvanirlekhna*, *Kaval*, *Mukhaprakshalana* etc. daily.<sup>[25]</sup>

Modern science also follows same treatment principals, it describes that, once dental calculus attaches itself to teeth, it cannot be removed with a toothbrush. Scaling is the first treatment for the removal of both supragingival and subgingival calculus.<sup>[26]</sup>

In *Sutrasthana Sushruta* mentions *Dantasharkara* as *Aaharana Sadhya Vyadhi*, but *Lekhana* is advised while describing *Chikitsa* of *Dantasharkara* in *Chikitsa Sthana*. And practically also *Lekhana Chikitsa* seems to be more suitable, modern method of scaling is *Lekhana* only. *Aahrana* is advised may be for impacted food particles, not the disease *Dantasharkara*.

Both *Aacharya Sushruta* and *Vagbhata* follow same treatment principals. Both advices to remove *Dantasharkara* and followed by *Pratisarana*. *Pratisarana* is advised to remove the infection and to strengthen roots after scraping/ scaling. *Dantasharsha Chikitsa* includes *Kavala* (gargling) with different medicated oils, in this way both *Aacharya* do not differ at this point too. This modality is added in the treatment of *Dantasharkara* to conquer tooth sensitivity. Long standing dental calculus causes gum recession which is the cause for tooth sensitivity. In most cases, calculus covers roots of teeth thus patient do not feel sensitivity after removal of tarter due to the absence of this calculus patients feel suddenly exaggerated sensitivity.

Negligence of oral hygiene will cause recurrence of disease after scaling. Studies done at regular intervals have proved that Ayurveda drugs like *Dantashodhana Choorna* can better help in the prevention of the disease in both *Pratisarana* and toothpaste forms in comparison to routine oral hygiene.<sup>[27]</sup>

#### ***Pathyapathya:***<sup>[28]</sup>

Although any specific *Pathyapathya* has not been mentioned for *Dantasharkara*, *Pathyapathya* described for *Mukharoga* and *Dantaroga* can be applied for the *Dantasharkara*.

***Pathya:*** *Aaharaja*- *Trina Dhanya*, *Yava*, *Mudga*, *Kulattha*, *Jangal mamsarasa*, *Shatavari*, *Karavellaka*, *Patola*, *Khadira*, *Katu*, *Tikta Dravya*, *Karpura Jala*, *Usnodaka*, *Tambula*, *Ghruta*. ***Viharaja***- *Dantadhavana sevana*

**Apathya:** Aaharaja-Amla Dravya, Matsya, Anupa Mamsa, Dadhi, Kshira, Guda, Masha, Abhishyandhi aahara, Ruksanna, Kathina Dravya. **Viharaja-** Divaswapna, Adhomukha Shayana.

**Table 1: Samprapti Ghataka.**

|                |   |
|----------------|---|
| Nidana         | Mukharoga Nidana & Kapha Prakopaka Nidana |
| Dosha          | Vata, Pitta (Madhava Nidana)+ Kapha       |
| Dushya         | Rasa, Asthi                               |
| Srotas         | Rasavaha, Asthivaha                       |
| Srotodusti     | Sanga                                     |
| Agni           | Jatharagnimandhya                         |
| Roga Marga     | Bahya                                     |
| Udbhava Sthana | Amashaya                                  |
| Adhithana      | Danta                                     |
| Sadhyasadhyata | Sadhya (Lekhana /Aahrana Sadhya)          |

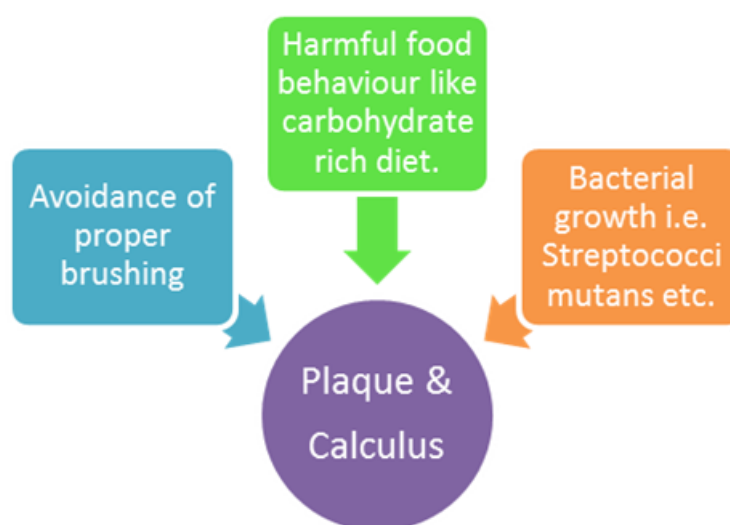


Supragingival calculus



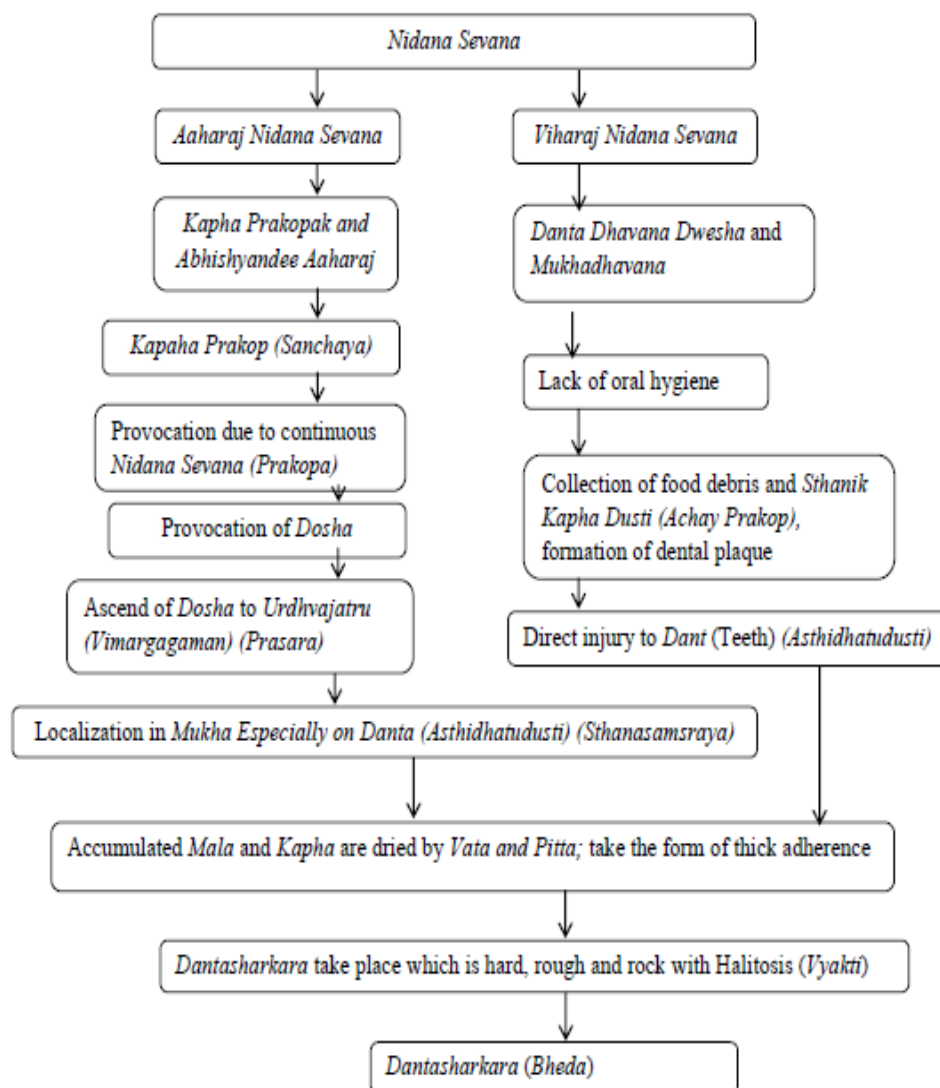
Subgingival calculus

**Picture 1: Types of dental calculus.**



**Picture 2:**





**Chart 1: flow chart of Samprapti of Dantasharkara.**

## CONCLUSION

After the survey of classical *Ayurvedic* texts with special reference to *Dantasharkara*, we can conclude that *Dantasharkara* can be defined as a *Vata-Kaphaj Vyadhi* with the predominance of *Kapha Dosha*. It is a disease characterized by the hardened accumulation of *Mala* on tooth surface which destroys the qualities of teeth and its surrounding structures and is accompanied by *Putigandha* (Halitosis). *Dantasharkara* is *Aaharana* and *Lekhna Sadhya Vyadhi*. *Dantasharkara* should be removed without injuring gums, followed by *Pratisarana* and *Diantaharsha Chikitsa*. After treatment special attention should be given on maintenance of oral hygiene to prevent its recurrence.

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