



TONGUE SANITIZATION

For an effective deep
cleaning of the tongue



Scientific Publications

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Halitosis clinic at Basel University



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The clinical picture of "halitosis" is extremely complex and involves various causes. These are most frequently found in the oral cavity – the first point of contact should therefore be a dentist specializing in this area. For the last 13 years, a professional halitosis clinic has been offered at Basel University. The following report provides a brief insight into the diagnosis and therapy concept.

Introduction

In the past few decades, the awareness of the topic of "bad breath" has been raised among patients and dentists. This is not only due to the topic's media presence but also to the increase in scientific publications on this subject. Despite well documented diagnosis and therapy concepts, in daily practice there is a certain helplessness when dealing with halitosis patients (1). More than half of those affected had been to one or more doctors about the issue prior to visiting the halitosis clinic, without success (2). Unfortunately, general treatments are often conducted which swallow time and money and lead to frustration. Time and again, patients travel far to seek help at a professional halitosis clinic (1). Often, they have been suffering from bad breath for years, which results in a large degree of psychological stress in those affected and can have a negative impact on their quality of life.

Epidemiological studies have shown that around 25 percent of the population sometimes and 6 percent permanently suffers from halitosis (1). As the causes of this are often found in the oral cavity, the first point of contact should be a dentist. The following report on the halitosis

clinic at Basel University only provides a small insight into the large and complex topic "halitosis". Those interested in further details should refer to the book "Halitosis, Professionelle Behandlung von Mundgeruch in der zahnärztlichen Praxis" (3).

Terminology

The term halitosis (Latin Halitus: breath, mist) describes unpleasantly smelling breath, regardless of the cause. Terms used synonymously such as bad breath or Foeter ex ore only refer to cases where the cause lies in the oral cavity. According to a recently published international guideline, the term "halitosis" should therefore be the only term used in order to include all possible clinical pictures (4). A differentiation is now made between intra and extra-oral halitosis, depending on the location of the cause .

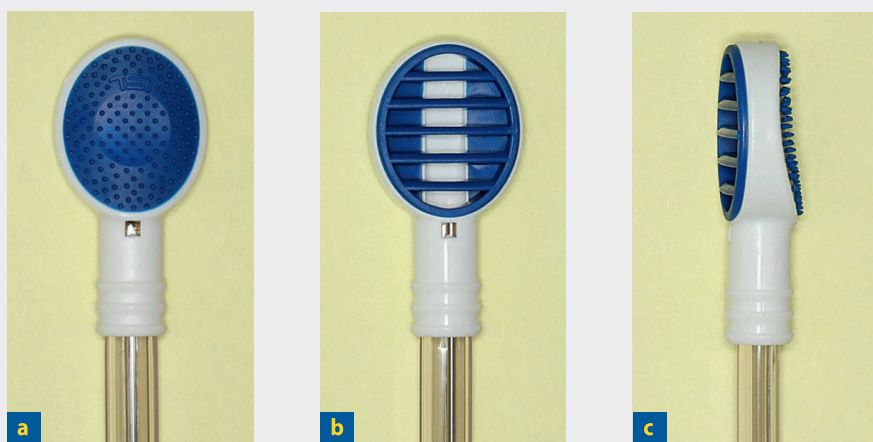
As well as real halitosis, there is also mentally-associated halitosis (pseudo-halitosis/halitophobia). In these cases, the patient complains of unpleasantly smelling breath which cannot be verified objectively. As opposed to halitophobia patients, with diagnosis and information, patients with pseudo-halitosis can receive therapy to be convinced otherwise.

Temporary halitosis is caused by food such as onions or garlic.

This recommended terminology for the diagnosis of halitosis (4) (Tab. 1) corresponds to a simplified international older classification (5-7).

Causes

Various studies have shown that in around 80-90 percent of cases, the source of an actual halitosis lies in the oral cavity (1, 2, 8). As most oral bacteria (>50 percent) are found on the surface of the tongue, the back of the tongue, in combination with the tongue coating, is the most frequent culprit. Micro-crevices and furrows of the epithelium of the tongue form oxygen-protected niches for gram-negative, anaerobic bacteria (1). Through the breakdown of organic materials (saliva, food residue, shed residue of the epithelium), these produce primarily volatile sulfur compounds (VSC) (9), which penetrate the breath and are perceived as an unpleasant smell. These bacteria are also responsible for gingivitis and marginal periodontitis (10) which, together with open carious lesions, a lack of oral and prosthetic hygiene or local infections such as pericoronitis, peri-implantitis and candidiasis, are possible causes of halitosis



Pic. 1a-c: TS1-Tongue Vacuum Cleaner with disposable saliva ejector
Pic. 1a: View of the nubby side, **Pic. 1b:** View of the lamella side, **Pic. 1c:** Sideview

of halitosis (1, 2, 8). Additionally, there are cofactors which promote halitosis originating in the oral cavity. Examples of this are reduced saliva flow rate, stress, smoking, oral respiration, an unbalanced diet, a Body Mass index that is too high or too low, not drinking enough water per day and consuming coffee and alcohol (11-13).

Contrary to popular opinion, extra-oral causes are rare (around 5 percent). These are most frequently found in the ear, nose and throat area (e.g. tonsillitis, sinusitis) and more seldom in the gastrointestinal tract (e.g. gastroesophageal reflux, diverticulum). Systemic illnesses (e.g. serious liver or kidney disease, diabetes mellitus type I) can also be responsible for halitosis (1, 3).

Diagnosis and therapy concept

Diagnostics

When making the appointment, the patient is informed about what they should do before the first appointment – this is the only way to obtain applicable examination results. Any treatment with antibiotics should have been completed at least four weeks previously. For two days beforehand, the patient should refrain from eating onions and garlic. Additionally, on the day of the examination, the patient should refrain from anything which may cover up the halitosis. This includes the use of perfumed

cosmetic products, sweets, chewing gum and mouthwash as well as smoking. Four hours prior to the appointment, the patient may not perform any oral hygiene, eat anything or drink any coffee.

The person performing the examination should not be suffering from rhinitis or

sinusitis, have bad breath themselves and should possess a good sense of smell. A simple test (Smell identification Test TM, Sensonics Inc.) can be used to detect a possible smell disorder (4). Anyone performing the halitosis clinic in Basel must pass this test before the first appointment.

The patient fills in a questionnaire developed especially for the halitosis clinic and brings it along to their appointment (www.andreas-filippi.ch). This special halitosis medical history form includes 35 questions about the type, frequency, time of day and extent of the halitosis, treatment already performed by doctors and dentists or home treatments, resulting psychological stress in the patient and typical cofactors. This also serves as the basis for the introductory discussion with the patient. In addition to the halitosis case history, a comprehensive medical and dental history is recorded. This also serves as the basis for the introductory

Tab. 1: Recommended terminology for the diagnosis of Halitosis (4,6)

Diagnosis	Description
Transient Halitosis	The unpleasant smell is nutritionally (z. B. by garlic)
Intraoral Halitosis	Existence of an obviously unpleasant odor beyond the social compatibility with / without impact on social contacts The source is the dorsal- posterior portion of the tongue and / or a pathology or dysfunction oral tissue (eg. as periodontal disease) Is by cofactors in influence, the impact on the saliva quality and can have quantity (eg. as smoking, medication, Sjögren's syndrome, etc.)
Extraoral Halitosis	The odor source comes from pathologies outside the oral cavity (nasopharyngeal space, lung or upper digestive tract)
Pseudohalitosis	An unpleasant odor may not be noticed by other people, nevertheless the person firmly expects that it has a bad breath. This condition is improving by enlightening advice and instruction in oral hygiene measures
Halitophobia	After treatment of halitosis or Pseudohalitosis the patient remains firmly convinced to suffer from halitosis, although not objectively there are indications

discussion with the patient. In addition to the halitosis case history, a comprehensive medical and dental history is recorded. Form asks primarily about existing medical and systemic diseases and the dental history form about frequency of dentist visits as well as the type and frequency of oral hygiene aids used (4, 14).

The clinical examination focuses on the oral predilection sites for halitosis. This includes the oral and pharyngeal soft tissue, in particular the tongue coating, pharynx ring and wetness of the oral mucous membrane. Additionally, the oral hygiene and dental restorations are assessed and a periodontal screening conducted.

The diagnosis of the respiratory air takes place organoleptically (with the examiner's sense of smell) as well as instrumentally (15, 16). During the introductory talk and the clinical examination, the perception of the halitosis depending on the distance between the examiner and the patient is recorded (distance 1 m = 3rd degree, distance 30 cm = 2nd degree, distance 10 cm = 1st degree) (17). The instrumental measurements with a sulfide monitor (Halimeter, Interscan) and a gas chromatograph (OralChroma™, Abilit) provide information about the strength and distribution of existing volatile sulfur compounds.

Therapy

An individual therapy concept is presented depending on the patient's findings and diagnosis. Generally speaking, micro-organisms and bacterial nutrient supply should be reduced and volatile sulfur compounds converted into non-volatile compounds. Oral cosmetics are used if required (18).

Existing inflammations such as gingivitis, marginal periodontitis, pericoronitis or peri-implantitis are treated. If necessary, a conserving, prosthetic or surgical treated is performed, if required with the support of a dental hygienist.

If tongue coating was diagnosed, profes-

sional tongue cleansing is performed. Due to the high risk of injury, professional teeth cleansing brushes are no longer used and the sonic or ultrasonic attachments available so far are inefficient on the soft tongue mucous membrane. A recently launched product is the TSI Tongue Sanitizer (TS Pro GmbH, Karlsruhe, Germany) (pic. 1a-c). This disposable plastic item is connected to the suction device of the dental unit with a single-use saliva ejector. Two functional sides enable professional cleansing of the tongue. First of all, a "tongue paste" is massaged in by moving the nubby functional surface back and forth across the tongue (pic. 2a and b). In doing so, the plastic nubs loosen the biofilm upon the surface of the tongue. The tongue sanitizer is then turned 180 degrees and the grooved side used to suction off the loosened coating (pic. 2c and d). To avoid injury, the tongue sanitizer should only be used to the highest point when the tongue is extended ("top of the hill"). The patient is recommended to clean their tongue at home using a tongue brush and tongue paste as part of their daily oral hygiene. Patients with thick tongue coating or a strong gag reflex should additionally use a disinfectant mouth wash for a short period of time. If cofactors were registered in the halitosis case history, these are discussed with the patient and corrected if possible. If necessary, the patient's general practitioner or appropriate doctor is consulted. Every patient receives an advisory guide on the topic of bad breath (19) so that they can take the time at home to read the information contained there.

About two weeks after the initial consultation, a check-up takes place. If the patient does not want a check-up appointment (e.g. due to living so far away), inquiries are made by phone or by e-mail to record the subjective opinion.

In the base of halitosis with extra-oral causes, the patient is referred to the relevant specialist (internal medicine, otorhinolaryngology).

If no halitosis could be diagnosed, the

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Pic. 2a-d: Professional tongue sanitization with the **TS1 Tongue Vacuum Cleaner**

Pic. 2a: Sticking out the tongue, **Pic. 2b:** Application and distribution of the tongue paste with the nubby side,

Pic. 2c: Extracting the dissolved organic films with the lamella side, **Pic. 2d:** Result of the professional tongue cleaning

patient is given another appointment at another time of day. In this way, circadian fluctuations can be recorded. In the case of patients with mentally-associated halitosis (pseudohalitosis/halitophobia), the patient is only informed of the diagnosis at the check-up appointment.

This enables the formation of a relationship of trust and increases the likelihood of the patient accepting the recommendation of any necessary psychological advisory services. The duration of a professional halitosis therapy is limited on average to two appointments of

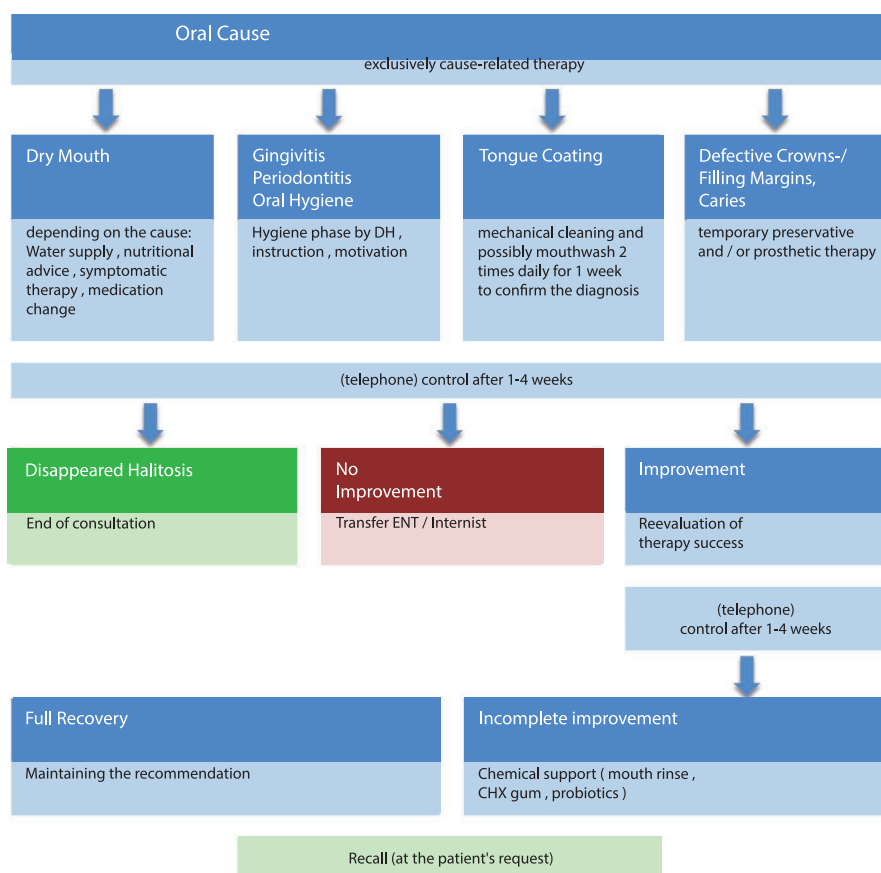
around an hour. With the aid of a strictly cause-related therapy concept (pic. 3), Basel University has been able to achieve a consistently high therapy success rate (>90 percent) over the years (2).

Conclusion

When it comes to halitosis patients, blind or general treatments are almost never successful and lead to dissatisfaction on the part of the patient and the person responsible for the treatment. If the treatment is conducted in line with a standardized pattern, a high level of therapeutic success (>90 percent) can generally be achieved. *pi*

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Pic. 3: Therapy concept the University of Basel (3)

TS1 Tongue Vacuum Cleaner

The TS1 Tongue Vacuum Cleaner is a high-quality product, produced in Germany in accordance with ISO 9001.



patent pending

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