

## Research Article

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# An Approach to Digitsucking Cases

## PART ONE

### Consideration of Methods of Instructions for Digitsucking Cases

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#### Introduction

Digitsucking causes maxillary protrusion and open bite. Depending on the morphological changes of the dentition and jaw bones the habit may lead to difficulty in mouth closure and possibly habitual mouthbreathing. Further, space between upper and lower incisors may secondarily lead to tongue thrust, affecting oral functions including swallowing and mastication. Such effects are not favorable for phonetics during the stage when a child is learning to speak. Consequently, from a prophylactic orthodontics point of view, active instructions to correct digitsucking are believed necessary.<sup>(1)(2)</sup>

#### Purpose of the Study

The authors and others have investigated instructional and treatment methods to effectively stop digitsucking in a short time based on experiences with 26 digitsucking patients (8 boys and 18 girls) in our clinic over a five-year period. From the results compiled, successes and failures will be reported.

#### Examination and Diagnosis

General dental records including facial and intraoral photographs, dental study models, cephalograms, and an orthopantomogram are taken prior to the start of instruction. Further, videotape records are made of digit-sucking pattern, the status of hard tissue or dentition and oral muscles and status and movement of soft tissues including presence or absence of tongue thrust as well as swallowing pattern and speech. Dental problems are examined and diagnosed comprehensively at the initial examination.

The parent is also questioned about the child's digit-sucking using a questionnaire, parent-child relationship test and child personality test. Further, during the instruction period for digitsucking, we carry out a picture diagnosis, and ask the mother to keep a diary of the child's behavior at home ("mother's diary"). Through these means we attempt to identify the reasons for digit-sucking and observe the child's personality, living environment and parent-child relationship to facilitate the treatment.

Questions asked in the digitsucking questionnaire include those concerning the child's infancy, eating habits, home/family environment, adaptability to school life and society, speech development and current speech status, the relationship between digitsucking and other oral habits and the parent's views regarding the treatment.

Where cooperation is possible, we also carry out the TK-type diagnostic, new parent-child relationship test and the Takagi infant/child personality diagnostic test. Because the patients are very young we ask the parents to fill in the forms in many cases.

Diagnostic information based on the child's drawings was incorporated in our digitsucking instruction program about three years ago; triggered by a picture drawn by a young patient.

Specialists involved in education, such as kindergarten, school and art teachers who for a long time have been in contact with children through their drawings, contend that pictures reflect children's minds.<sup>(3)(4)</sup> A pedagogist, Professor Hiromoto Ohgita, has proposed an instruction modality to evaluate a child's personality and interpersonal relationships from drawings and to develop creativity and enhance individuality in each child.<sup>(5)</sup>

In the field of psychoneuropathy, art therapy is used as a means of psychotherapy. It holds that a picture represents a symbolic conversation between a therapist and a young patient and the act of drawing (an act of creating a piece of art) is related to the treatment mechanism.<sup>(6)</sup>

When children are asked to draw, they can either be given a predetermined subject or draw freely whatever they desire. In our study, we asked the children to draw their families on a b-4 size drawing papers with crayons.

A child can express the feelings held toward the family members by drawing pictures, while the same feeling may not be expressed verbally. But there is no guarantee that by making a child draw the family, the child will always express his/her feelings toward the family members in these drawings. There are instances where no findings can be obtained. The approach is only

meaningful when the child's feelings are shown. Dr. Gen Ishikawa, a neuropsychiatrist, states that the way to go about trying to diagnose parent-child or family relationships from pictures or drawings is to use an ability anyone is equipped with, that is, sensitivity and sensibility and base one's thinking on common sense.<sup>(7)</sup>

In an attempt to avoid the danger of becoming dogmatic or prejudiced by making diagnostic decisions on our own the authors have been advised by Mr. Saburo Nezu who was long involved with childrens' drawings and who is also a jurist for the Japanese children's painting competition.

In the cases of parent-child relationships and personality tests, the mother often replies to the questions if the patient is very young. This inevitably leads to responses which are highly subjective. Meanwhile, when a picture is drawn by the child or a child is frank when drawing, it is believed that what is in the child's mind can be expressed without inhibition. Since the child's digit-sucking problem may stem from psychological factors, the picture approach is believed to be a valid means of detecting such factors. Also, it is believed that to have the child draw pictures will aid the communication between instructor and child and thus facilitate the instruction efforts.

The mother records in a diary the child's behavior at home during the instruction period/therapy; for instance whether he/she behaves differently after having been given treatment, or how the child is trying not to suck his/her digit(s). Some children develop other problems such as bed wetting or biting fingernails after starting therapy. The diary is used as one means to decide if there is a problem in stopping the digitsucking.

In order to record the child's behavior, it is necessary to pay more attention than usual to the child. This inevitably requires the mother to observe the child more carefully and closely. The mother ceases to remain a mere supervisor at home leaving everything else to the dentist. It is important that the mother assumes a role of an instructor at home.

From analysis of the way records are entered, the mother's diary will give clues as to her intelligence, willingness to go through the treatment and her co-operation level.

### **Methods of Instruction and Treatment**

In our daily clinical work the authors give instructions and treatment in stages based on the programs indicated in Figure 1 for digitsucking cases. These staged programs are: (1) making the patient conscious of the problem and maintaining awareness by applying behavior therapy (2) training of the tongue habit and orbicularis oris muscles by myofunctional therapy, and (3) improvement of malocclusion with habit breakers and functional appliances.

To make the patient aware of the problem and maintain the awareness through behavior therapy (1), we would first use the patient's intraoral photographs,

dental arch model or a photo album to visually explain the problem to the patient. An artificial tooth set up in clay is also used to show how a continuous pressure from a digit can move teeth and change the shape of the jaw. Thus, by explaining the many effects of digitsucking, the patient is motivated to stop the habit. Next, in order to make the motivation last, we instruct the patient using a sticker chart method or a coloring chart method based on operant conditioning and token economy methods of behavior modification therapy.

#### **Methods of Instruction and Treatment for Digitsucking**

- A. *Becoming conscious, staying conscious*  
→ *behavior / psychological therapies*
- B. *Tongue habit and orbicularis oris training*  
→ *myofunctional therapy*
- C. *Occlusal improvement with habit breakers  
and functional appliances*  
→ *dental appliances*

**Figure 1**

For the training of a tongue thrust and orbicularis oris muscles with myofunctional therapy (2), we select relatively simple exercises from the myofunctional therapy program for the very young patient.<sup>(8)(9)</sup>

For the improvement of occlusion using habit breakers and functional appliances (3), we would actively use a functional appliance if we can obtain the patient's cooperation to shorten the treatment period. While the authors do not deny the effectiveness of using habit breakers to control oral habits, we are very careful to use them sparingly. We use such appliances only after we have tried all other possible methods; for cases where no other means are successful. This is done only when we can obtain the full understanding and compliance of the patient.<sup>(10)</sup>

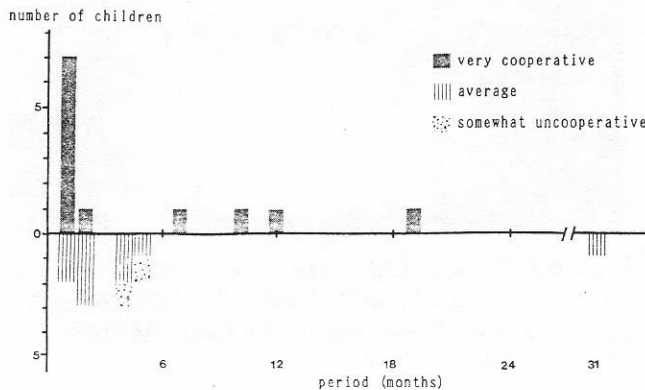
Instructions are always given by the same instructor once every two to three weeks. One instruction session lasts for about 30 minutes. The total period of instruction will vary from case to case since it is continued until digit-sucking stops. After the habit is stopped, orthodontic treatment is started as required.

### **Results and Discussion**

The patients were first seen when they were between four years, four months and ten years, ten months old; the mean age at the first appointment being seven years, one month. Twenty-three out of 26 patients stopped their digitsucking due to the instructions (the remaining three are continuing with their instructions). The instructions continued for an average of five months and the mean number of instruction sessions was 6.7.

As for the relationship between the time it took to stop digitsucking and the degree of mother's cooperation, there were many instances of the habit stopping within

about one month when the mother was highly cooperative in giving instructions and training. However, very young cases (four-year-olds) required from ten months to over one year, even though the mothers were highly cooperative (Figure 2). Difficulties involved in instructing children four years and younger are believed to be involved here.



**Figure 2. Relationship between Time Required to Stop and Mother's Cooperation**

Meanwhile, among the cases where the mother's cooperation was considered to be average or somewhat problematic, many patients stopped their habits after two to four months.

Analysis of the relationship between the time required to stop the habit and the frequency of digitsucking, among children who sucked their fingers also during daytime, revealed that some required only a short time to stop and others needed longer. A trend could not be generalized. However, a majority of children who sucked their digits only before falling asleep at night were observed clinically to stop their habits within four months. It seems that digitsucking is relatively easy to stop if it is limited to before falling asleep at night.

Four cases from the 26 shall be presented to illustrate factors associated with success or failure.

#### CASE 1:

Girl; seven years, six months old at the time of the initial examination. Her digitsucking had started soon after birth and continued. However, frequency of digitsucking had been decreasing and the habit was limited to just before falling asleep at night by the time of her visit.

Her family consists of parents and an elder sister — a family of four. A personality test revealed a mild emotional instability and a regressive tendency. A parent-child relationship test revealed no major problem. The patient's drawing of her family included a dog. It was interpreted sentimentally as positive, indicating the child was learning to treat a small creature with loving care.

#### INSTRUCTIONS GIVEN

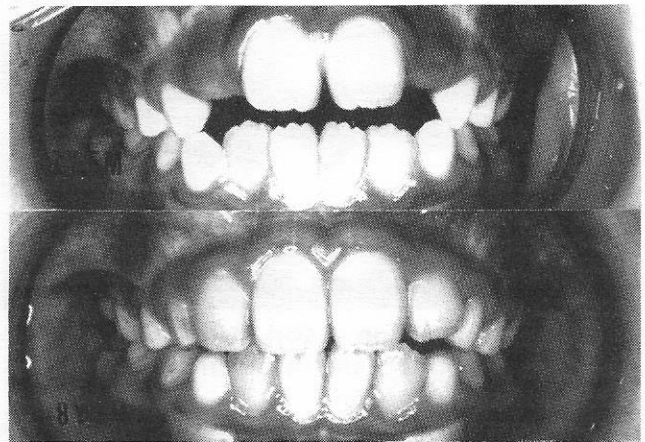
As soon as the effects of digitsucking were explained using a photo album prepared for this purpose at her first visit, she stopped her digitsucking. Two months later treatment combining myofunctional therapy and functional appliances was started to improve her occlusion and reduce her tongue habit.

Figure 3 is an intraoral comparison between the first visit and ten months later. Improvement in occlusion is observed.

She is currently under observation which will continue until eruption of her permanent teeth is completed.

#### EVALUATION OF THE INSTRUCTION

The most important reason why this was a successful case in stopping the digitsucking is that the patient was aware that it would be better to stop digitsucking. She was also encouraged by her family and the fact that the instruction was timely, i.e. given right before she started primary school. It is also suspected that because she already had the awareness, all she needed was a chance to stop. It is believed this particular case was helped by an intervention of a third person.



**Figure 3. Case 1: Top — Girl, 7 yr. 6 mo. old, at the start of the instructions. Bottom — 10 months later. The overbite has been improved.**

#### CASE 2:

Girl; seven years, eight months old at the initial examination. Her digitsucking started when she was about seven months old and had continued since. The habit was reportedly decreasing in its frequency to only before falling asleep at night.

She came from a family of four consisting of her parents, sister (four years younger) and herself. A parent-child relationship test indicated the father to have somewhat of a dominating tendency. She was evaluated as having a tendency to be regressive and unable to adapt to family life by the personality test. Her mother believed that she was digitsucking only because it had become her habit, and that there was no other particular reason.

Based on the picture of her family drawn by the patient, it was interpreted that, for her, the mother's presence within the family is quite strong, and further, that she feels closer toward her mother than toward her father or sister.

#### INSTRUCTIONS GIVEN

After explaining the effects of digitsucking, instructions were given combining the sticker, number and fingerstall methods. At the initial examination the patient was saying that the finger she sucked tasted good, but after two months her digitsucking had almost ceased. While it took seven months for the habit to cease completely, she sucked



her finger only once consciously and only once or twice subconsciously at night during the last five months or latter half of the instruction period. Deciduous canines were adjusted interproximally with a disk and a simple program of myofunctional therapy carried out by giving instructions once every one to two months in order to improve her occlusion.

Figure 4 is an intraoral comparison of "before instructions" and one year and eight months later. Because the patient's family had moved, treatment at our clinic was discontinued at this point.



**Figure 4. Case 2: Top — Girl, 7 yr. 8 mo. old, at the start of the instructions. Bottom — 1 yr. 8 mo. later.**

#### EVALUATION OF THE INSTRUCTION

While the patient's awareness and intervention of a third person (i.e. the instructor) were possible factors which contributed to stopping the digitsucking, it is believed that in this case the major contributing factor had been the mother's eagerness and encouragement.

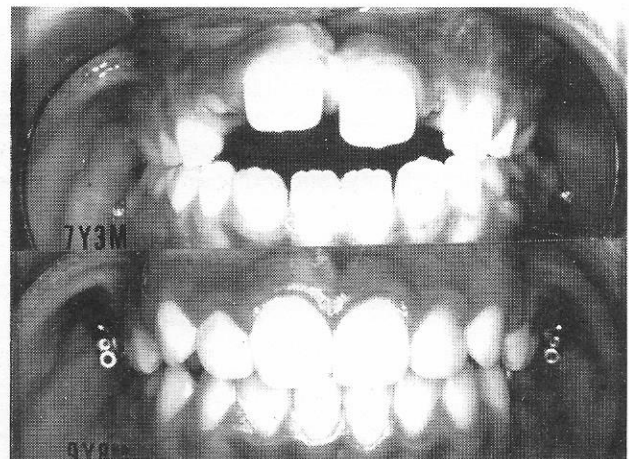
#### CASE 3:

Girl; seven years, three months old at the initial examination. The digitsucking which had started at around six months old had continued until the time she came to our office, but the frequency had reportedly been decreasing to only occasional digitsucking right before falling asleep.

She came from a family of four consisting of her parents, a sister one year older than her and herself. A personality test revealed no problem in particular, but it was noted that she did not speak during the initial examination, giving us an impression that she could not adapt to a new environment. Judging from the patient's drawing, it was felt that she lacked the childlike carefree character and was mentally oppressed. We were not able to obtain her father's cooperation for the parent-child relationship test.

#### INSTRUCTIONS GIVEN

Instructions were initially given using the sticker method. When the patient came to the office the second time and we saw that the stickers were successfully applied every day, we suspected that she was well on her way to stopping her habit. Therefore, we gave instructions in which myofunctional therapy was combined to improve her occlusion. However, the mother made the criterion for



**Figure 5. Case 3: Top — Girl, 7 yr. 3 mo. old, at the start of the instructions. Bottom — 2 yr. 5 mo. later. The overbite has been improved.**

judging digitsucking more strict starting at around the third month, telling the child that a mere act of bringing her finger near her mouth would be deemed a failure. Many days followed where she could not apply the stickers to the chart. Due to the stricter criterion, she apparently lost her willingness to continue making efforts. While the digitsucking itself ceased after four months, the loss of her cooperation continued to affect the exercises of myofunctional therapy. Her occlusion could not be improved as much as we had hoped for, and, thus, we were forced to make her wear a habit breaker in order to prevent tongue thrust. Subsequently, after she turned nine and her desire for better esthetics were enhanced, her attitude became more positive toward the treatment. After that, occlusion was improved using functional appliances and a headgear.

Figure 5 is an intraoral comparison between the initial examination and 2 years 5 months later.

#### EVALUATION OF THE INSTRUCTION

Reflecting on the instructor's part, it is felt that because the open bite was so severe, the treatment was rushed by starting to combine other techniques without waiting for the digitsucking to completely stop. The instructor should have also motivated the patient more positively for an adequate occlusal guidance while the patient was between seven and nine years old. With regard to the patient's family it is felt that cooperation for the treatment and consistent encouragement from all the family members were not sufficient.

#### CASE 4:

Girl; seven years, ten months old at the initial examination. Her chief complaint was that she could not bite off food with her front teeth. Digitsucking, which had started soon after birth, had been reduced in frequency to just at night before falling asleep, but she was still reportedly digit-sucking everyday.

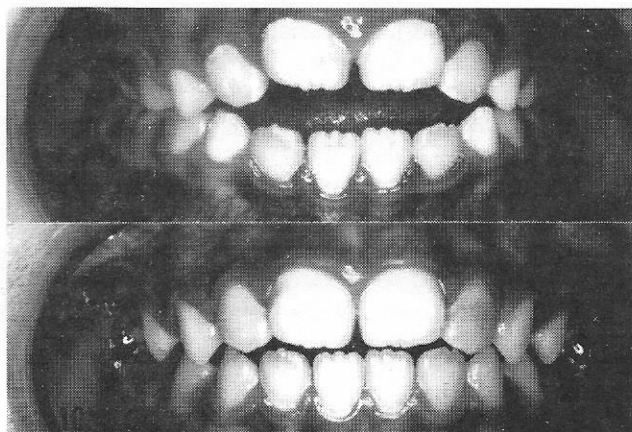
She came from a family of four consisting of her parents, an older brother and herself. Her parents are both professional musicians and her mother gives piano lessons at

home. While personality and parent-child relationship tests indicated no serious problem in particular, when asked to draw a picture of her family the patient drew in black lines separating each member of the family. According to picture diagnosis such a mode of expressions is often observed when there are problems in interpersonal relationships, such as the child feeling there are psychological barriers between the family members.

#### INSTRUCTIONS GIVEN

Instructions for digitsucking started from the second visit using the sticker method and glove. Since by the third visit all the stickers were successfully applied on the chart, the patient was fairly old and the malocclusion severe, it was decided at this point to start correcting the malocclusion for an early improvement combining a simple myofunctional therapy program. While the frequency of digitsucking reduced, even after four months passed the digitsucking could not be stopped completely. The patient also tended to skip the myofunctional therapy exercises. Subsequently, the myofunctional therapy was discontinued but the treatment continued using functional appliances, and headgear. The patient has not yet completely stopped her nighttime digitsucking.

Figure 6 is an intraoral view comparison between initial examination and two years, five months later.



**Figure 6. Case 4: Top — Girl, 7 yr. 10 mo. old, at the start of the instructions. Bottom — 2 yr. 5 mo. later. The overbite has not been fully improved.**

#### EVALUATION OF THE INSTRUCTION

While the patient was not reluctant to come to the office, she lacked seriousness to improve her malocclusion. This is believed to be mainly due to the patient's lack of awareness of her problem. As for the parent (mother) who would hopefully make up of the patient's weak will, she more or less gave an impression of wanting to leave everything up to the instructor. Reflecting on the instructor's part, treatment was too rushed, starting to combine other methods before digitsucking stopped completely.

#### Conclusion

Based on the compilation of the data from the 26 cases in which instructions were given, the authors have reconfirmed that the following considerations need to be made for effective digitsucking instructions.

#### Patient

- The child is aware of his/her problem and has the will to stop digitsucking and to go through the instructions/training.
- A young child is often influenced by the surrounding environment (for instance encouragement from the family) rather than his/her own awareness. Therefore, creating the right environment is important.
- In the case of an older child, school-aged and beyond, the child's own will rather than the surrounding environment is the important contributing factor to success. Thus, for somewhat older children extra efforts are called for in motivation.

#### Family

- Eager willingness and cooperation of the family (in particular the mother) is extremely important. Instructing the family and particularly the mother is important.
- It is desirable to try to stop the habit when family life is free of various problems.

#### Instructor

- The instructor should be eager in giving instructions, should make continuous efforts to establish good relationships with the patient and the family, and try to constantly improve the relationships.
- The instructor should first concentrate on stopping the digitsucking. The period of instruction should be minimized.
- Involving oneself as a third person, the instructor can play a role of giving a chance to the patient to stop the habit.

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