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Digit Sucking – What to do

Abstract: Dentists are often questioned by anxious parents about the effects of digit sucking and the possible ways of stopping their child's habit. This article discusses the aetiology, prevalence and effects of digit sucking, various means of stopping the habit and the problems that may occur if digit sucking persists into the permanent dentition.

Clinical Relevance: Digit-sucking habits can have a detrimental effect on the development of the occlusion. Various methods are discussed to help children to stop.

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Thumb sucking is considered normal in babies and young children.

Natural nutritive sucking instinct leads some babies to suck their thumb or fingers during the first few months of life, or even before birth (Figure 1). Babies have a natural urge to suck, which usually decreases after the age of six months as weaning occurs. However, many babies continue to suck their thumbs after this time. Thumb sucking can become a habit in babies and young children who use it to

comfort themselves when they feel bored, tired or anxious, although it does not necessarily mean that the child is insecure.¹ Jenkins *et al* found that digit sucking is more prevalent in children of higher social classes.²

In the UK, the prevalence of digit sucking has received little research. Patel examined 713 schoolchildren in Kettering between the ages of 7 and 11 and found that 23.6% of children reported a history of a habit and 12.1% reported

a habit that persisted past the age of 7 years.³ The Avon Longitudinal Study of Pregnancy and Childhood found that, at 15 months old, 63.2% of children had a sucking habit, of which 37.6% sucked a comforter or dummy and 22.8% sucked a digit. By 36 months, all non-nutritive sucking had reduced to 40%, with a similar ratio between dummy and digit sucking.⁴ A Portuguese study examined 1,190 pre-school children between 3 and 5 years of age and found 40.2% to have non-nutritive sucking habits, with 12.5% being digit suckers.⁵

The effects of digit sucking are varied and are dependent on a number of factors, including the position of the digit within the mouth and the frequency/duration of the habit. They are summarized as:

- Proclination of maxillary incisors;
- Retroclination of mandibular incisors;
- Reduced overbite or anterior open bite (AOB), which is frequently asymmetric; and
- Posterior crossbites due to narrowing of the upper arch.⁶

The tell-tale signs are the clean pink digit, anterior open bite and slightly asymmetrical arch form (Figures 2 a–d).

The change in inclination of the incisor teeth is caused by the application of prolonged forces by the digit. The reduced overbite or AOB is caused by a combination of increased alveolar growth in the molar region and reduced alveolar growth in the incisor region (Figure 3). This may result in an upward tilt to the maxilla (Figure 4). The posterior crossbite is thought to be the result of the change in balance of the forces from the soft tissues. When the digit



Figure 1. An ultrasound image of a 20 week foetus sucking his thumb.

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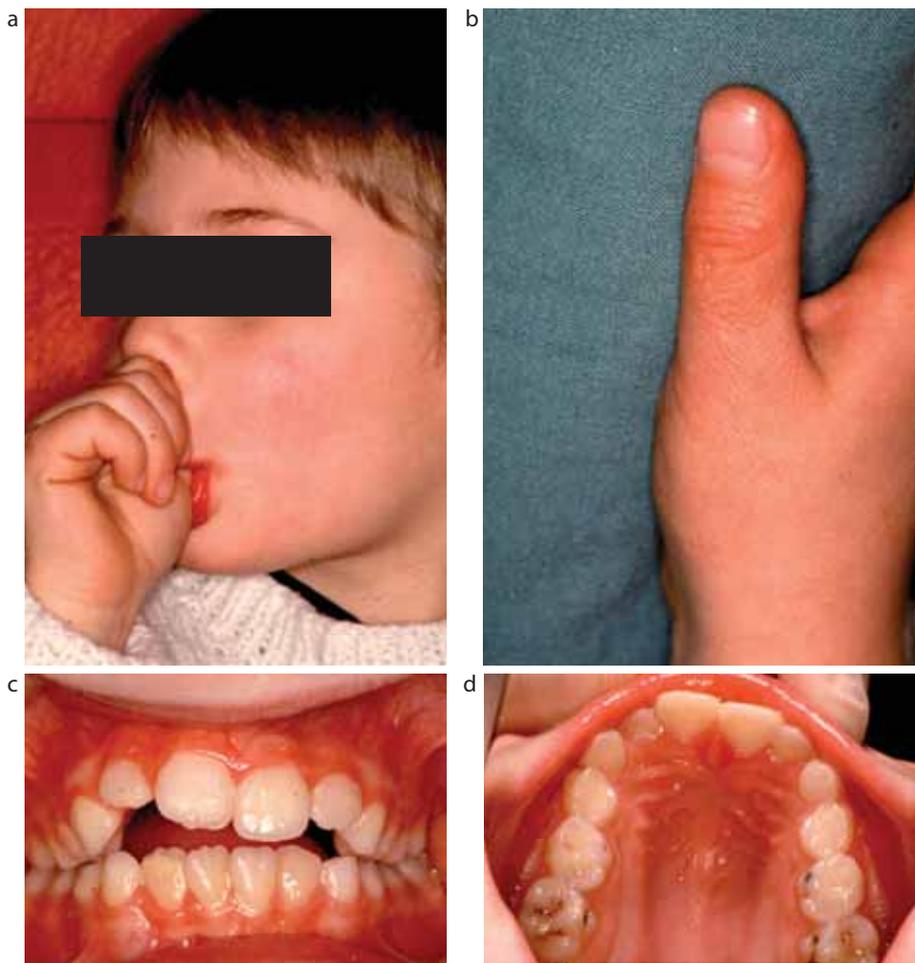


Figure 2. (a) A young boy sucking his thumb; (b) the clean, pink thumb; (c) unilateral anterior open bite; (d) distorted maxillary dental arch.



Figure 3. OPG radiograph showing significant distortion to the occlusal plane.

is being sucked, the tongue is depressed and unbalanced muscle pressure from the cheeks then tip the teeth palatally, resulting in a narrowing of the maxilla and a posterior cross-bite.

There has been considerable discussion regarding the possible merit of introducing a comforter or dummy to the baby instead of allowing a digit habit to establish itself. Orthodontic



Figure 4. Lateral skull radiograph showing the upward inclination of the maxilla.

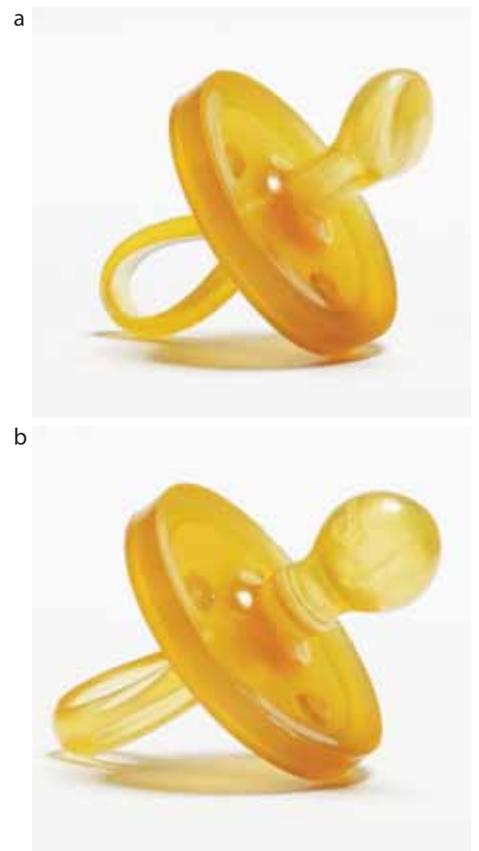


Figure 5. (a) Orthodontic dummy; (b) cherry dummy.

dummies (Figure 5a) are shaped with a thinner dummy 'stalk' than the cherry dummy (Figure 5b). The teat is designed to collapse to encourage babies to suck in the same way as they would if they were breastfeeding. It is thought that this design may reduce the effects of the dummy on the occlusion. In the Avon study, dummy-sucking habits had the most influence on affecting the anterior and posterior

occlusions.⁴ However, the study failed to note which type of dummy was used.

More importantly, a number of clinical trials have shown that dummy use is protective against sudden infant death syndrome (SIDS) in children younger than six months.^{7,8} In 2005, it was included in the American Academy of Pediatrics SIDS guideline update.⁹ Hence, the use of a dummy may be a life-saver in the very young.

It is important that any digit-sucking habit should be stopped before the eruption of the permanent teeth. The longer the habit continues, the more likely it is that there will be permanent effects on the developing dentition and the more difficult resulting treatment may become. It is therefore important that the GDP is able to provide the child and parents with help in stopping the habit.

One of the questions most commonly asked is 'What is the best time to stop my child's habit?'. In dental terms, the answer is 'the sooner the better' and ideally before the permanent dentition is established. However, the child's age and development must be taken into consideration when advising parents.¹⁰ Addressing the problem when the child is ready and willing to give up is more likely to be successful than attacking it head on and forcing him or her to quit.

There are numerous approaches which can be employed to treat chronic thumb sucking. These can be split into three distinct categories:

- Behavioural – rewarding a child for not exercising the habit;
- Mechanical – preventing or interrupting the process of thumb sucking;
- Aversive – generating negative sensations when the habit is exercised, such as bad taste, pain or major discomfort.

Usually, initial attempts made by parents to stop their child's digit sucking belong to the behavioural category. Reward charts are a popular means of supporting this approach, with stickers recording every day completed without the thumb or fingers being sucked.¹¹ Additional help may be available from speech therapists and child psychologists to explore this approach. An article in a national newspaper featured a bespoke nanny, Kathryn Mewes, who guarantees that she can stop thumb sucking in three days.¹² She lists among her top tips:

- Avoid bribing: reward on results;
- Present the challenge as a series of choices;
- Visual aids remind the children what they have achieved;

- Star charts give the notion of a goal;
- Have realistic expectations;
- Be consistent: stick with a new rule.

Whilst it is undoubtedly pleasant to adopt such a positive attitude in helping the child to stop, this approach is problematic because children often put their thumb in their mouth subconsciously, especially when falling asleep at night, when their own behavioural control is reduced.

The mechanical approach relies on devices which are designed to prevent or interrupt thumb sucking. Popular examples include placing a sock over the hand and securing it with sellotape around the wrist. This prevents the sock being pulled off at night, when the child is asleep. A bandage wrapped around the child's elbow can be used to prevent his/her elbow from bending and the thumb reaching the mouth. However, it restricts movement and may make the sleeping process uncomfortable at night. Several manufacturers have developed devices to help stop a child's thumb-sucking habit. Probably the most widely known of these is ThumbGuard™. It is made out of a soft clear plastic material and works by interrupting the habit by breaking the vacuum created by sucking.

Aversive approaches can be divided into two categories: home remedies and treatment provided by a dentist. Home remedies include bad tasting nail varnish, which can be applied to the thumb or fingernails, and sticking plasters, which can be applied to the digits. It is important that this method is not seen as a punishment. Instead, it should be used in a positive way by telling the child that it will help by reminding them of their goal. However, these methods can fail as the child becomes accustomed to the bitterness of the nail varnish or simply sucks away the taste. The plasters are often removed at night and replaced in the morning to mislead the parents that thumb sucking is not going on overnight. Some children still suck their thumbs whilst wearing the plaster.

Appliance treatment includes fixed and removable intra-oral devices. Removable appliances have the advantage that they can be removed during eating and toothbrushing. However, because the appliance is removable, it is a potential disadvantage as it can be removed by the child in an attempt to continue the digit-sucking habit. It is important that the appliance is presented to the child in a positive manner. Upper removable appliances, similar to a Hawley retainer,

are most effective when the appliance is modified with a transverse ridge between the canines to interrupt the sucking habit (Figure 6). The authors believe that offering such an aid to the child, and getting his/her co-operation, is an essential part of achieving success.

Fixed appliances, by their nature, cannot be removed by the child and can be useful in cases where all else has failed. Some are simply fixed versions of the acrylic ridge aid (Figure 7). They do not cause the child any discomfort, but prevent the vacuum formed by sucking. The Bluegrass appliance (Figure 8) is considered to be a successful design of a fixed habit breaker.¹³ It consists of a trans-palatal arch with a hexagonal section of Teflon which sits on the palate behind the upper central incisors. Success rates of 93% have been reported and the habit has stopped in a mean of 12 weeks.¹⁴

Other fixed appliance designs come under the deterrent category as they are designed to cause discomfort if sucking occurs. Their use divides opinion and they are felt by some to be cruel, inflicting pain and suffering on children which is out of all proportion to their necessity.¹⁵ The Rake appliance (Figure 9) has a number of sharp spikes which hang down behind the upper central incisors and cause significant discomfort if the thumb is sucked. However, the authors feel that these deterrent appliances



Figure 6. An upper removable appliance with an acrylic ridge.



Figure 7. A trans-palatal arch with an acrylic ridge.



Figure 8. Bluegrass roller.



Figure 9. The Rake appliance.

should not be used as they may have adverse affects on the child's perception for future dental intervention.

In summary, there are a number of ways of supporting the child who is keen on giving up a digit-sucking habit. Parents of younger children can be reassured that the incidence of thumb sucking reduces with age and most children stop spontaneously between two and four years of age.¹

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