Nailbiting, or onychophagia: A special habit

Orlando Motohiro Tanaka,[a] Robert Willer Farinazzo Vitral,[b] Giulia Yuriko Tanaka,[c] Ariana Pulido Guerrero,[d] and Elisa Souza Camargo[e]
Curitiba and Juiz de Fora, Brazil

Onychophagia, or nailbiting, is a common oral habit, observed in both children and adults. The etiologies suggested for nailbiting include anxiety, stress, loneliness, imitation of other family member, heredity, inactivity, transference from a thumb-sucking habit, and poorly manicured nails. Treatment should be directed at the causes; punishment, ridicule, nagging and threats, and application of bitter-tasting commercial preparations on the nail are a variety of reminders, but are not appropriate approaches to treatment. The key to success is the nailbiter's consent and cooperation. (Am J Orthod Dentofacial Orthop 2008;134:305-8)

Onychophagia[1] or onychophagy,[2] the habit of biting one's nails, is commonly observed in both children and young adults.[3-7] Onychophagy is classified as a nail disease caused by repeated injuries. Nailbiting as autodestruction and onychophagy are its most aggressive forms.[8]

The need to bite and even to eat fingernails is linked to a psychoemotional state of anxiety.[5,8,9] A child, by biting his or her nails, is exhibiting an evolutionary disturbance linked to the oral stage of psychological development. Along with this process, children go through distinct phases, but this evolution is not, as a rule, followed by greater consequences for those with normal development.

In most cases, the problem is not observed before the age of 3[5,7,10,11]or 4.[2] Greater incidence is seen between the ages of 4 and 6; it stabilizes from 7 to 10 and increases considerably during adolescence,[7,10-13] perhaps because this period is, almost as a biological determination, a time of crisis. These young people have almost left childhood but are not yet adults. To most adolescents, this is a difficult and even traumatic passage. The incidence of nailbiting is relatively equal up to 10 years of age, but thereafter significantly fewer girls than boys are nailbiters.[14]

[a]Senior professor, Pontifícia Universidade Católica do Paraná, Graduate dentistry program, Orthodontics, Curitiba, Brazil.
[b]Associate professor, Universidade Federal de Juiz de Fora, Juiz de Fora, Brazil.
[c]Graduate student, Universidade Federal do Paraná, Curitiba, Brazil.
[d]Postgraduate student, Pontifícia Universidade Católica do Paraná, Curitiba, Brazil.
[e]Associate professor, Pontifícia Universidade Católica do Paraná, Curitiba, Brazil.
Reprint requests to: Orlando Motohiro Tanaka, Av. Mal Deodoro, 630, 1703, CEP 80010-912, Curitiba, Brazil; e-mail, tanaka.o@pucpr.br.
Submitted, March 2006; revised and accepted, June 2006.
0889-5406/$34.00

doi:10.1016/j.ajodo.2006.06.023

Dentofacial functional abnormalities such as nailbiting can occur with other dentofacial conditions and should be diagnosed and managed according to the particular requirements of each clinical situation. Correction or control of this functional problem might involve alteration of behavior patterns and multidisciplinary treatment[15] and should be evaluated to identify specific concerns regarding stability and to suggest additional methods of retention to improve stability.[16]

Etiology

Nailbiting, demonstrating anxiety made worse by tense moments, is seen as a reflex of emotional unbalances,[3,5,7,11,17] albeit not an important psychiatric symptom.[13] Incidence is reduced after the age of 16,[5,10] making the habit "normal" between 4 and 18, due to its high prevalence in this age range.[5]

Nailbiting has a sequence of 4 distinct postures. Initially, the hands are placed close to the mouth and keep there for a few seconds to half a minute. Next, the fingers are quickly tapped against the front teeth. A series of quick spasmodic bitings follows, with the fingernails pressed tightly against the biting edge of the teeth. Finally, the finger is withdrawn from the mouth, either to be inspected visually or to be felt by another finger by palpation.[18]

The basic cause of onychophagia is difficult to determine. Although nailbiters have more anxiety than those without the habit, no significant difference was found when relating onychophagia to anxiety.[1] Others explain it as a family trend, probably due to imitation.[5,10]

Many people bite their nails in moments of stress. Children do it in moments of anguish, when they do not know a lesson, read sad stories, listen to horror stories, or are "forced" to go to bed at night.[5]

In general, onychophagia is not a concern-raising habit and will spontaneously disappear when not stim-

ulated. On the other hand, when associated with other problems, it becomes more complex, requiring specialized help. When a child swallows the bitten-off nails, stomach problems can develop, in addition to the hygienic aspect of nails, which are seldom clean, and various diseases can be transmitted. By inference, onychophagia is a transference of the thumb-sucking habit, because this tends to be abandoned during the third year of life, when onychophagia starts.[3,19,20]

After adolescence, onychophagia is usually replaced by the habit of lip "pinching," chewing of pencils or other objects, nose scratching, or hair twirling.[5,7] In adults, smoking or gum chewing seems to be a more common substitute, because these are socially accepted methods of oral gratification. These can be considered good ways to transfer the onychophagy habit.[7,11]

Complications

Nailbiting children are at risk of developing malocclusion of the anterior teeth.[21-23] Apical root resorption is a common and undesirable side effect of orthodontic treatment, particularly for the maxillary central incisors. Nonphysiological forces acting on the teeth, such as those from nailbiting, can speed up resorption[24] or cause apical root resorption[24-27] because, during treatment, the teeth are ligated to the archwire, and forces from biting can be transmitted through the wire to the neighboring teeth, exerting unfavorable pressure on the periodontium,[27] even without orthodontic treatment.[28] Clinical examinations of these patients can show crowding, rotation, and attrition on the incisal edges of the mandibular incisors and protrusion of the maxillary incisors. These malocclusions are created by pressures from the onychophagia habit.[11]

It is believed, however, that no specific malocclusion is associated with onychophagia,[12] because references are vague and not backed up by clinical or statistically significant evidence that onychophagia leads to malocclusion.[3,5] Thus, it should not be seen as the primary cause of occlusal maladjustments.[11] Under these situations, the nailbiting habit seems to be more difficult to correct than an eventual malocclusion.[12] The forceful and continuous habit of nailbiting causes alveolar destruction in the area of the involved teeth.[29] Chronic nailbiting can produce small fractures at the edges of the incisors, and gingivitis might result from continued nailbiting.[30] Nevertheless, the lack of scientific evidence in the literature, as well as personal observation, indicates that ordinary nailbiting has no serious effect on the dentition,[5] even considering its duration, frequency, and intensity.[31,32]

Secondary bacterial infection can occur from diseases of the nail such as onychomycosis and paronychia, and nailbiting might spread the infection to the mouth. Conversely, a nailbiter with oral herpes can develop herpetic whitlow of the bitten finger.[30] A favorable aspect of nailbiting is that fingernail growth is not retarded[30]; it increases nail growth by approximately 20%, perhaps because frequent manipulation of the nail stimulates the circulation to the germinal area in the nail root.[33]

Management

The important thing in trying to manage nailbiting is not to curb the habit or punish the child. When the child realizes that the parents have noticed the habit, he or she certainly will insist on it, to become the focus of attention.[34] Repression, under these circumstances, is a "request" for the child to adopt the habit, rather than abandon it.

A similar contradiction is seen when parents lecture on a subject, such as smoking or drinking, and exhort the child to abandon it because of damage to health.[5] In onychophagia, as with other oral habits, the criteria of age, intensity and frequency of the action, situations triggering the habit, and emotional condition should be considered.

To be able to quit the habit, the patient must be motivated. He or she must be aware of the need to abandon the habit, and here the professional role acquires relevance, offering helpful suggestions in overcoming the addiction. Severe or sudden suppression might introduce personality alterations.[4] Some people spontaneously quit onychophagia because of fear of developing infections; others quit to imitate friends who have attractive nails.[35] As a rule, no treatment is needed for mild cases of onychophagia.[34] For more serious situations, treatment should involve removal of the emotional factors inducing the habit (excitement, overstimulation, unhappiness, idleness, for example); in most cases, a little more attention, affection, and comprehension are enough to break the habit.

Outdoor activities requiring great physical effort (skating, running, ball playing) might be indicated, since they function as tensions releasers.[5] Outdoor play and opportunities to use the mind, hands, and emotions in arts and crafts are recommended.[30] Oral or physical punishment, ridicule, nagging, and threats are not helpful and often compound the problem or replace it with more serious psychological disorders, and might cause social conflicts and feelings of guilt. Ultimately, the parents' education might be the best treatment for these children.[5]

When the habit is abandoned early, the malocclusion will usually revert without treatment. However, the

absence of the habit is not a guarantee of having the malocclusion corrected. As a rule, correction is a factor in reducing the habit.[7] Application of a bitter-tasting commercial preparation to the nail, in the hope of stopping the habit, is ineffective; these procedures cause greater tension in young people who should, rather, be more tranquil. These methods are thus unwanted and even harmful.[2,7] An exception would be the application of olive oil to the nails, making them soft and pliable, removing the temptation to chew off nails with the teeth.[36] The use of occlusive dressing on the fingertips and wearing mittens or pajamas that cover both the hands and the feet are a variety of reminders and should only be used with the consent and cooperation of the child.[30,37]

Keeping the nails well trimmed is another useful measure, so that poorly trimmed corners and cuticles are not temptations. For girls, having the nails manicured in a sophisticated beauty parlor, instead of at home by a family member, could have a positive and surprising result. Boys might apply bandages to their fingers, letting their friends believe they are treating injuries, rather than fighting onychophagy.[36]

An effective alternative to overcome the problem is to ask the patient to use the rubber bite piece when he or she feels the urge for nailbiting or has anxiety (watching films, TV, athletic games, pretest tensions), promoting the liberation of tension by indulging in a vice. Chewing sugar-free gum, if not compulsively done, could also be a way to keep the mouth occupied and render the habit difficult or impossible.

As the patient gets used to the rubber biter or the gum rather than the nail, the professional should ask the patient to let 1 fingernail grow. The nails on the other fingers are free to chew on, if the desire remains. After that, the number of intact nails can be gradually increased.

Occupying the hands with another activity, such as handicrafts or a musical instrument, might also be effective in keeping the hands away from the mouth.[9]

Another important ally in removing the habit is family conviviality, which is often neglected because of the work and worries of the modern world. With greater family intimacy, in the comfort of the home, or even outside one's place, anxieties and tensions can be more easily liberated to preserve as much as possible such moments. From a general point of view, the best method to handle a nailbiter is to educate the child, stimulate good habits, develop conscious awareness, and thus guarantee effective results, because no other way to stop the habit is more efficient, intelligent, and satisfactory.[2]

Onychophagia is considered, even in our days, an unsolved problems in medicine and dentistry. It is difficult to analyze and differentiate between what is normal or abnormal in onychophagia, and what is normal or abnormal for a nailbiter. It does not follow, however, that "normal" implies ideal or desirable.[5] Every child is bombarded with "this you can do" and "that you cannot do," and is surrounded by frequent frustrations that inevitably generate tensions. When the tensions and frustrations are mild, the child absorbs and assimilates them, adapting to these environmental factors and living normally.[5]

During treatment, the child should be given emotional support and encouragement. Behavioral modification techniques, positive reinforcements, and regular follow-ups are important aspects of treatment with a multidisciplinary approach, if necessary, and the child's consent and cooperation keys to a good prognosis.[38]

CONCLUSIONS

Onychophagia treatment should be directed at the causes of any precipitating stress; punishment, ridicule, nagging, and threats are not helpful and often replace the nailbiting habit with a more serious problem. A multidisciplinary approach should focus on efforts to build up the child's self-confidence and self-esteem.

REFERENCES

1. Deardoff PA, Finch AJ, Royall LR. Manifest anxiety and nail-biting. J Clin Psychol 1974;30:378.
2. Schwartzman J. Onychophagy. Arch Pediatr 1939;56:599-604.
3. Wechsler D. The incidence and significance of finger-nailbiting in children. Psychol Rev 1931;18:201-9.
4. Pearson GHJ. The psychology of finger sucking, tongue sucking, and other oral habits. Am J Orthod 1948;34:589-98.
5. Massler M, Malone AJ. Nailbiting. A review. J Pediatr 1950;36: 523-31.
6. Birch LB. The incidence of nailbiting among school children. Br J Educ Psychol 1955;25:123-8.
7. Sassouni V, Forrest EJ. Orthodontics in dental practice. St Louis: C. V. Mosby; 1971.
8. Pelc AW, Jaworek AK. Interdisciplinary approach to onychophagia. Przegl Lek 2003;60:737-9.
9. Araujo MCM. Orthodontics for the clinician. São Paulo: Ed. Livraria Santos; 1982.
10. Pennington LA. Incidence of nail biting among adults. Am J Psychiatry 1945;102:241-4.
11. Salzmann JA. Practice of orthodontics. Philadelphia: J. B. Lippincott; 1966.
12. Moyers RE. Handbook of orthodontics. Chicago: Year Book Publisher; 1988.
13. Ballinger B. The prevalence of nail-biting in normal and abnormal populations. Br J Psychiatry 1970;117:445-6.
14. Malone AJ, Massler M. Index of nailbiting in children. J Abnorm Soc Psychol 1982;47:192-202.
15. American Association of Orthodontists. Excerpts from American Association of Orthodontists clinical practice guidelines for orthodontics and dentofacial orthopedics 1996. Am J Orthod Dentofacial Orthop 1997;111:443-9.

16. Poling R. A method of finishing the occlusion. Am J Orthod Dentofacial Orthop 1999;115:476-87.
17. Hill JM. Nail-biting: incidence, allied personality traits and military significance. Am J Psychiatry 1946;103:185-7.
18. Billig AL. Fingernail biting: its incipiency, incidence and amelioration. Genet Psychol Monogr 1941;24:123-218.
19. Massler M, Wood AW. Thumb-sucking. J Dent Child 1949;16:1-9.
20. Levy D. The psychiatric angle of finger sucking. Child Develop 1937;8:99-101.
21. Moore GR. The orthodontic program of Michigan State Department of Health with a new classification of occlusion for survey purposes. Am J Orthod 1948;34:355-61.
22. Cartwright FS. Orthodontics, safe and sane. Int J Orthod 1935; 21:699-703.
23. Billig AL. The consistency of finger nail-biting. Proc Penn Acad Sci 1946;20:39.
24. Odenrick L, Brasttstrom V. Nailbiting: frequency and association with root resorption during orthodontic treatment. Br J Orthod 1985;12:78-81.
25. Massler M, Malone AJ. Root resorption in human permanent teeth. Am J Orthod 1954;40:619-33.
26. Goldson L, Henrickson CO. Root resorption during Begg treatment: a longitudinal roentgenologic study. Am J Orthod 1975; 68:55-66.
27. Odenrick L, Brasttstrom V. The effect of nailbiting on root resorption during treatment. Eur J Orthod 1983;2:185-8.
28. Harris EF. Patterns of incisor root resorption before and after orthodontic correction in cases with anterior open bites. Am J Orthod Dentofacial Orthop 1992;101:112-9.
29. Miller SC. Effect of abnormal biting habits (case report). New York J Dent 1931;1:385.
30. Leung AKC, Robson LM. Nailbiting. Clin Pediatr 1990;29: 690-2.
31. Graber TM. The "three M′s": muscles, malformation, and malocclusion. Am J Orthod 1963;49:418-50.
32. Graber TM. Orthodontics: principles and practice. Philadelphia: W. B. Saunders; 1972.
33. Bean WB. Nail growth. Thirty-five years of observation. Arch Intern Med 1980;140:73-6.
34. Bakwin H. Thumb and finger-sucking in children. J Pediatr 1948;32:99-101.
35. Coleman JC, McCalley JE. Nail-biting among college students. J Abnorm Soc Psychol 1948;43:517-25.
36. Isaacs S. Bad habits. Int J Psychiatr 1935;16:440-54.
37. Monti AE. Tratado de ortodoncia. Buenos Aires: El Ateneo; 1958.
38. Schneider PE, Peterson J. Oral habits: considerations in management. Pediatr Clin North Am 1982;29:523-46.