

Accidental Ingestion of Nance Palatal Archwire in COVID 19 lockdown

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Abstract

The management of orthodontic patients without a regular appointment in the COVID 19 lockdown situations requires special care, cooperation, and maintenance. Accidental ingestion and inhalation of orthodontic appliances or a part of it may create severe problems in the gastrointestinal tract and airways respectively, proficient management of the occasion would be basic to spare the patient’s life. The objective of the article is to introduce a case of Nance palatal archwire ingestion in a 17 years old girl and its consequences and recommended approaches despite the period of COVID 19 pandemic situations.

Keywords: Nance palatal wire; accidental ingestion; orthodontic emergencies; COVID 19 Lockdown.

Introduction

One of the most challenging management in orthodontic treatment during the COVID-19 pandemic is extreme orthodontic emergencies. The management of orthodontic patients without a regular appointment in the COVID 19 lockdown situations requires special care, cooperation, and maintenance^{1,2}. Accidental ingestion and inhalation of orthodontic appliances or a part of it may create severe problems in the gastrointestinal tract and airways respectively. Stability and retention of the appliance are the main cause which led to this type of serious complication, in which patient face difficulty in breathing, eating, swallowing and associated pain with internal hemorrhage and some special cases may lead to death due to suffocation^{3,4,5}. Prevention is the best way yet when

occurred, proficient management of the occasion would be basic to spare the patient's life⁶. The objective of the article is to introduce a case of Nance palatal archwire ingestion and consequences and recommended approaches despite the period of COVID 19 pandemic situations.

Case Report

A 17-year-old girl presented with the chief complaint of forwardly placing of upper and lower front teeth. During diagnosis and treatment planning, we decided to go for upper and lower first premolar extraction with maximum anchorage preparation for fixed orthodontic therapy to achieve the objectives of the patient. Nance palatal arch was banded in upper dentition and a lingual holding arch was banded in the lower dentition to provide required anchorage. After getting the patient's information about the ingestion of some part of the appliance, and complications of pain while swallowing, uneasiness in the neck, and difficulty in breathing, we advised reporting in the otorhinolaryngology emergency in our hospital. Meanwhile, the patient is telephonically advised to control the swallowing reflex and turn the head to one side during rest.

Questionnaire and consent for screening patients with the potential risk of infection of COVID-19 as per guideline before any intervention. Under the proper guideline of the COVID-19 outbreak, a radiograph of the frontal and lateral view of the neck was taken to localize the object (**Fig.1**). The radiographs showed vertical impaction of palatal archwire anterior to C6 and C7 level in the upper oesophageal region. Since the patient had no side effect of injury or perforation, a preservationist approach was liked to perform in the conference with a gastroenterologist, to recover the wire component by endoscopy. At endoscopy, it was found to be in the upper part of the esophagus. By utilizing endoscopic grasper, the wire component was grasped, delicately pulling it out of the upper oesophageal

area along with endoscope (**Fig.2**). The intraoral band or attachment was thoroughly examined with the recovered wire component for any missing part (**Fig.3**), intraorally we found a band of the right upper first molar was loose, cementation of the band was done, and then the patient was sent to the home with proper instruction of three days home quarantine. These procedures were performed with the proper guideline issued to the handling of these patients. Her sample for the COVID 19 virus testing was done as precautionary measures by experts.

Discussion

This case report mainly focuses on extreme orthodontic emergencies while lockdown in the COVID-19 pandemic, in spite of the fact that the frequency of inhalation and ingestion episodes with the orthodontics is fortunately not common. Foreign body ingestion and inhalation can bring about intense clinical and life-threatening emergencies^{7, 8}. Any foreign body whether it is a part of the orthodontic appliance or any other dental prosthesis, in the airway needs to be treated as a serious situation⁹. Most of the cases of swallowing or inhalation are associated with patient activated orthodontic appliances or while delivering orthodontic care⁶.

In most of the cases, after being swallowed, a foreign body follows a tract of the oropharynx, epiglottic vallecula, pyriform recess, via esophagus to the stomach, and passes through the intestine in stool without any serious complications^{9, 10, 11}. The majority of the revealed cases were ingestion; only a few were inhalation. One study reported the ratio of ingested foreign body in the GI tract and tracheobronchial tree was 4:1 while another study revealed more ratio of the same incidence^{12, 13}.

Lack of retention of orthodontic appliances is the main reason for ingestion which happens infrequently in orthodontics¹⁴. Bondable orthodontic components are most commonly ingested among other components and

their loosening rate during a half year has been assessed as 7.4-10.6% and increased up to 15.6-17.6% in one and a half year^{15,16}.

Other than brackets¹⁷, a variety of other orthodontic appliances had reportedly been ingested in contemporary orthodontic practice. Among them maximum cases are of expansion key ingestion^{9,18,19} followed by molar band²⁰, piece of arch wire^{21,22}, Transpalatal arch²³, Lower spring retainers²⁴, and part of the fractured piece of removable appliances^{25,26} was reported. A rare case of quad-helix ingestion and its surgical recovery had been reported in syndromic patient²⁷. All previous reports suggest that whether the appliance is fixed or removable, metallic, or acrylic and large or small mishaps, in any case, are consistently possible^{28,29}.

In the present case, accidental swallowing of wire component of Nance palatal arch was seen outside the clinic, the patient had been instructed on a video call and asked to report to the hospital immediately, localization and endoscopic recovery had been performed with the proper guideline of prevention of the COVID 19 infection. These types of cases are quite difficult to manage for inexperienced clinicians also the situation is anxious to the patients and difficulty in managing these cases during the COVID-19 pandemic is more difficult for both.

Patient Survey Information: Patient-reported negative for RT-PCR (real-time- polymerase chain reaction).

Conclusion

1. The orthodontic appliance must be efficient to withstand the masticatory forces throughout the orthodontic treatment.
2. Retention/stability should be evaluated before delivering the orthodontic appliance.
3. Motivation towards the orthodontic treatment for the appliance helps the patient to maintain it and to reduce the chances of such accidents.

4. Early reporting by the patient, early object localization by imaging, immediate management, and referral is always a gold standard to deal with these types of situations.
5. A variety of treatment options related to management has been suggested based on the location of objects and type of emergency.
6. In the COVID-19 pandemic, the management of such cases should be done by the guideline given by the government organization, state authority, and local health regulatory bodies.

Abbreviations: COVID 19 – Corona Virus disease 2019
RT-PCR - Real-Time- Polymerase Chain Reaction.

Consent to participate: Subject gave informed consent to the work.

Consent for publication: All authors consent to the publication.

Availability of supporting data: All reviewed and cited articles have been referenced.

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Reference

1. Caprioglio, A., Pizzetti, G.B., Zecca, P.A. et al. Management of orthodontic emergencies during 2019-NCOV. Prog Orthod. 21, 10 (2020). <https://doi.org/10.1186/s40510-020-00310-y>
2. Sunjay Suri, Yona R. Vandersluis, Anuraj S. Kochhar, Ritasha Bhasin, Mohamed-Nur Abdallah; Clinical orthodontic management during the COVID-19 pandemic. Angle Orthod 1 July 2020; 90 (4): 473–484. DOI: <https://doi.org/10.2319/033120-236.1>

3. Al-Wahadni, A.; Al-Hamad, K.Q.; Al-Tarawneh, A. Foreign body ingestion and aspiration in dentistry: A review of the literature and reports of three cases. *Dent. Update* 2006, 33, 561–570. [PubMed]
4. Klein, A.M.; Schoem, S.R. Unrecognised aspiration of a dental retainer—A case report. *Otolaryngol. Head Neck Surg.* 2002, 126, 438–439. [CrossRef] [PubMed]
5. Dibiasse, A.T.; Samuels, R.H.A.; Ozdiler, E.; Akcam, M.O.; Turkkahraman, H. Hazards of orthodontic appliances and the oropharynx. *J. Orthod.* 2000, 27, 295–302.[CrossRef] [PubMed]
6. Umesan UK, Chua KL, Balakrishnan P. Prevention and management of accidental foreign body ingestion and aspiration in orthodontic practice. *Ther Clin Risk Manag.* 2012;8:245-252. DOI:10.2147/TCRM.S30639
7. A. P. Madrona, J. A. F. Hern´andez, M. C. Prats, J. R. Riquelme, and P. P. Paricio, “Intestinal perforation by foreign bodies,” *European Journal of Surgery*, vol. 166, no. 4, pp. 307–309, 2000.
8. N. G. Velitchkov, G. I. Grigorov, J. E. Losanoff, and K. T. Kjossev, “Ingested foreign bodies of the gastrointestinal tract: a retrospective analysis of 542 cases,” *World Journal of Surgery*, vol. 20, no. 8, pp. 1001–1005, 1996.
9. Tripathi T, Rai P, Singh H. Foreign body ingestion of orthodontic origin. *Am J Orthod Dentofacial Orthop.* 2011;139(2):279-283. DOI:10.1016/j.ajodo.2009.04.026
10. Hinkle FG. Ingested retainer: a case report. *Am J Orthod Dentofacial Orthop* 1987;92:46-9.
11. Al-Wahadni, A.; Al-Hamad, K.Q.; Al-Tarawneh, A. Foreign body ingestion and aspiration in dentistry: A review of the literature and reports of three cases. *Dent. Update* 2006, 33, 561–570.
12. Koch H. Operative endoscopy. *Gastrointest Endosc* 1977;24: 65–8.
13. Webb WA, McDaniel L, Jones L. Foreign bodies of the upper gastrointestinal tract: current management. *South Med J* 1984;77:1083–6.
14. Reeta Varho, Hanna Oksala, Mimmi Tolvanen & Anna-Liisa Svedström-Oristo (2015) Inhalation or ingestion of orthodontic objects in Finland, *Acta Odontologica Scandinavica*, 73:6, 408-413, DOI: 10.3109/00016357.2014.971867
15. Dos Santos JE, Quioca J, Loguercio AD, Reis A. Six-month bracket survival with a self-etch adhesive. *Angle Orthod* 2006; 76:863–8.
16. Reis A, dos Santos JE, Loguercio AD, de Oliveira Bauer JR. Eighteen-month bracket survival rate: conventional versus self-etch adhesive. *Eur J Orthod* 2008;30:94–9.
17. Laureano Filho JR, Godoy F, O’Ryan F. Orthodontic bracket lost in the airway during orthognathic surgery. *Am J Orthod Dentofacial Orthop* 2008;134:288–90.
18. Sfondrini MF, Cacciafesta V, Lena A. Accidental ingestion of a rapid palatal expander. *J Clin Orthod* 2003;37:201–2.
19. Monini Ada C, Maia LG, Jacob HB, Gandini LG Jr. Accidental swallowing of orthodontic expansion appliance key. *Am J Orthod Dentofacial Orthop* 2011;140:266–8.
20. Naragond A, Kenganal S, Rajasigamani K, Kumar NS. Accidental ingestion of molar band and its management: maintenance is better than management. *Case Rep Dent.* 2013;2013:891304. DOI:10.1155/2013/891304
21. Milton TM, Hearing SD, Ireland AJ. Ingested foreign bodies associated with orthodontic treatment: report of three cases and review of ingestion/aspiration incident management. *Br Dent J* 2001;190:592–6.

22. Quick AN, Harris AM. Accidental ingestion of a component of a fixed orthodontic appliance – a case report. *SADJ* 2002;57:101–4.
23. Absi EG, Buckley JG. The location and tracking of swallowed dental appliances: the role of radiology. *Dentomaxillofac Radiol* 1995;24: 139-42.
24. Klein AM, Schoem SR. Unrecognized aspiration of a dental retainer: a case report. *Otolaryngol Head Neck Surg* 2002;126: 438–9.
25. Rohida NS, Bhad WA. Accidental ingestion of a fractured Twin-block appliance. *Am J Orthod Dentofacial Orthop* 2011;139:123–5.
26. Parkhouse RC. Medical complications in orthodontics. *Br J Orthod* 1991;18:51-7.
27. Allwork JJ, Edwards IR, Welch IM. Ingestion of a quad-helix appliance requiring surgical removal: a case report. *J Orthod.* 2007;34(3):154–157.
28. Sachan A, Chaturvedi TP. Emergency orthodontic care. *Int J Orthod Milwaukee.* 2011;22(4):21-25.
29. Sharma, Vipul & K, Yadav & Chaturvedi, T.. (2015). Mishaps in Orthodontics: A literature review. *International Journal of Dentistry and Oral Science.* 10-14. 10.19070/2377-8075-SI04002.

Legend Figure

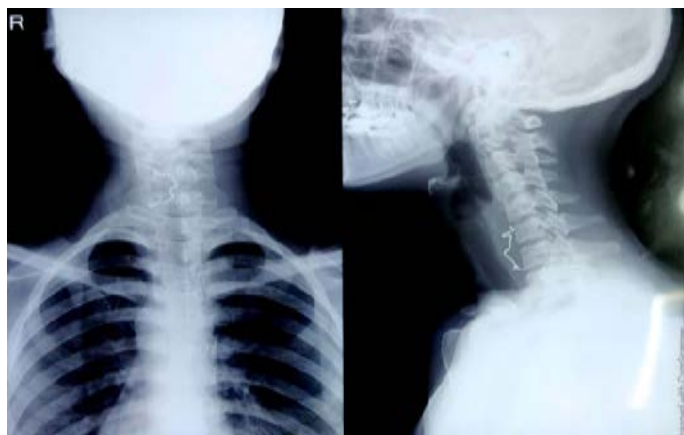


Fig 1: A-Posteroanterior view of neck shows wire component at the level of C6 and C7; B-Lateral view of neck shows wire component at the level of C6 and C7.



Fig 2: A-Endoscopy confirmed that the wire component with acrylic button was lodged in upper part of esophagus; B-Removal of appliance with the help of endoscopic grasper.



Fig 3: Retrieved Nance palatal arch with wire component and acrylic button.