

Management of Embedded Lingual Holding Arch (Orthodontic Appliance) in Mandibular Arch by Electrocautery: A Case Report

Dr. Gauranshi Gupta¹, Dr. Shailendra S. Chauhan², Dr. Aditya Sinha³,
Dr. Satendra Sharma⁴, Dr. Radha⁵

Department of Periodontics,
K.D Dental College and Hospital, A. B. V. Medical University, Mathura, India.

Corresponding Author: Dr. Gauranshi Gupta

DOI: <https://doi.org/10.52403/ijrr.20250224>

ABSTRACT

Introduction: In dentistry and orthodontics, there is a potential risk of dental instruments, such as orthodontic brackets and wires, becoming accidentally lodged in the aerodigestive tract. Numerous complications related to the ingestion or aspiration of foreign objects have been reported in clinical practice.

Case Report: A 19-year-old female patient, referred from the Department of Orthodontics to the Department of Periodontics, presented with a primary complaint of pain during chewing. The pain was attributed to an embedded lower lingual arch, an orthodontic appliance, which had become lodged due to a failure in the orthodontic treatment. Upon intra-oral examination, bands were observed on the lower first molars in both the right and left quadrants, with no visible signs of inflammation or infection. Radiographic assessment, specifically in the occlusal view, revealed the presence of a wire encircling the bone, indicating the orthodontic appliance's abnormal positioning.

Conclusion: Accidental injuries involving foreign bodies during orthodontic treatment can lead to serious consequences, including the development of dental anxiety and a loss

of trust in the orthodontist. To minimize these risks, orthodontists need to carefully evaluate the likelihood of small appliances being ingested, aspirated, or penetrating the oral cavity, as managing such incidents can be difficult within the limited, saliva-filled space of the mouth. These occurrences can have a profound psychological impact on both patients and their families, often leading to fear or reluctance toward future treatment. In many cases, resolving such complications requires the expertise of a skilled surgeon, who must be fully aware of the clinical situation to ensure appropriate management and care.

Keywords: Lingual holding arch, orthodontic therapy, mucosal overgrowth

INTRODUCTION

In dentistry and clinical orthodontics, there is a potential risk that any dental instrument including orthodontic brackets and wires, can become lodged into the aero digestive tract, and many complications regarding ingestion or aspiration of foreign bodies have been documented. Depending on the site and composition of the objects, foreign bodies can be detected and localized by plain radiographs, computed tomography (CT), magnetic resonance images (MRI), and ultrasound. Among these, a

preoperative ortho pantograph is invaluable before surgical exploration because it can provide an accurate position of the foreign body relative to adjacent structures and help the surgeon to identify potential structural difficulties in retrieving it. Particularly, the type and size of the object or the proximity of the object to vital anatomical structures can present challenges to the surgeon.

A lingual arch is an orthodontic device which connects two molars in the upper or lower dental arch. The lower lingual arch (LLA) has an arch wire adapted to the lingual side of the lower teeth. LLA are fabricated by placing bands on the molars. These are connected to the arch wire. The wire can be soldered to the bands or inserted into lingual sheaths welded to the molar band (removable LLA). We report a case in which an orthodontic appliance lower lingual holding arch became embedded because of loosened appliance due to clinician overlook or failed visit and was successfully removed by using electrocautery adequate interpretation of Occlusal radiograph, without additional use of fluoroscopy or a navigation system.

CASE REPORT

A case of embedded lower lingual arch an orthodontic appliance due to failure of orthodontic therapy, affecting 19-year-old female patient referred from department of orthodontics and reported to the department of periodontics, with a chief complain of pain during chewing food. On intra oral examination there are bands present on lower 1st molars of both right and left quadrant with no signs of inflammation and infection. While radiographically in occlusal view there is presence of wire around bone.



Fig 1: facial view of patient showing orthodontic therapy



Fig 2: intra-oral examination shows presence of lingual holding arch in lingual mucosa

On further findings, there was no swelling or redness around, but the presence of wire fell on palpation. We examined the case and diagnosed a wire embedded in lingual mucosa with the help of a radiograph and decided to remove it surgically with electrocautery.

Blood investigations are advised for the patient along with phase 1 therapy including pre-antibiotic prophylaxis. After 1 week of phase 1 therapy (scaling and post-hygiene instruction), a patient came to our department for a surgical procedure. Before proceeding with surgery patch test (hypersensitivity reaction with LA) should be performed on the patient. Local anesthesia was infiltrated at the affected site and an incision was given with the help of electrocautery avoiding damage to the lingual nerve.



The incision is given from the left side 2nd premolar up to the right side 2nd premolar following the shape of an arch and wire is exposed and retrieved with the help of a P24G instrument.



Fig: 3 showing exposed lingual arch wire after incision

Welded bands on 1st molar and labially placed wire should be removed under the guidance of an orthodontic surgeon.



Fig: 4 post operative photograph of lower lingual arch appliance

After successful retrieval of appliance resorbable sutures were placed avoiding tissue tearing.



Fig: 5 intra operative photograph showing placement of suture.

Post operative instructions and medicines prescribed to patient and recalled after a week for follow up. After a week follow up picture was taken and patient was satisfied

with the treatment having no complaints of any type of pain while chewing.



Fig:6 post operative follow up pictures

DISCUSSION

The patient's course provided important clinical insights. Orthodontic appliances can occasionally become embedded in a patient's soft tissue although an orthodontist may not show concern until faced with evidence of such a foreign body. Orthodontists should handle these appliances carefully, especially when cutting orthodontic archwires or managing other small and sharp pieces. In addition, an orthodontist carefully deals with every case, but mishaps occur occasionally, during appliance placement with sufficient force this can propel them to penetrate the oral mucosa and become embedded.

Numerous case reports in dental and medical literature document instances of embedded, ingested, aspirated, or retained materials. Management strategies typically depend on the type and location of the foreign body, as well as the patient's age,

with recommendations tailored to the specifics of each rare case. Although reported cases in orthodontics are less frequent, the range of objects involved is highly varied, including brackets, bands, second molar buccal tubes, trans palatal arches, removable appliances and their fragments, arch wire pieces, sectional arch wires, coil springs, expansion appliance keys, retainers, and quad helices.

Routine protection of appliances is recommended during orthodontic treatment. Some orthodontics appliances designed as such cause complications similarly, a lingual holding arch has such complications, in this case loose lingual arch can be displaced due to tongue pressure. Given this patient's timeline and records, this is the most likely explanation for the present case. Several cases of orthodontic appliances accidentally becoming embedded in the soft tissue have been reported.

A case report is given by Wilmott SE, Ikeagwuani O, McLeod NMH et al (2016) in which an orthodontic bracket is embedded into the medial pterygoid surface. Similarly, Takuma Watanabe, Atsue Yamazaki, Shizuko Fukuhara, Shigeki Yamanaka, and Kazumasa Nakao Etal reported a case in which a piece of orthodontic arch wire embedded in the buccal mucosa. They present a case where an orthodontic arch wire fragment became embedded in the buccal mucosa and was successfully removed through precise interpretation of CT images, without the need for additional fluoroscopy or a navigation system.

Bradford CB, Shroff B, Strauss RA, Laskin DM. et al report a retained archwire fragment in the pterygomandibular space. Cone-beam computed tomography (CBCT) was recommended. Spatially localize the foreign object. It was decided that attempting to retrieve the wire fragment was not advisable at that time due to the patient's asymptomatic condition, the fragment's proximity to the lingual nerve, and the potential risk of nerve damage during retrieval. Instead, the surgeons chose to monitor the fragment radiographically at intervals of 6 months to 1 year to track any positional changes. A follow-up CBCT scan performed 6 months after the initial imaging revealed no changes in the wire fragment's position, indicating that it remained stable at that time.

In our case, the patient reported to us with chief complaints of pain during mastication or chewing food. On examination, clinically no signs of gingival inflammation were seen. Thus on radiological assessment presence of an orthodontic appliance is seen, in a week with proper instruments and investigation we surgically removed it by electrocautery. At follow up patient is satisfied and resumed with remaining orthodontic therapy.

CONCLUSION

Accidental injuries involving foreign bodies during orthodontic treatment can have

significant consequences, including the development of a phobic response toward further care and a potential loss of trust in the orthodontist. To mitigate these risks, orthodontists must assess the likelihood of accidental ingestion, aspiration, or penetration of small orthodontic appliances, which are challenging to manage in a confined, saliva-filled oral environment. Such incidents may profoundly impact the psychological well-being of patients and their families. Resolving these situations often requires the expertise of a surgeon, who must thoroughly understand the clinical context to provide appropriate care.

Declaration by Authors

Acknowledgement: None

Source of Funding: None

Conflict of Interest: The authors declare no conflict of interest.

REFERENCES

1. Eggers G, Haag C, Hassfeld S. Image-guided removal of foreign bodies. *Br J Oral Maxillofac Surg* 2005;43(5):404–9.
2. Khan I, Singhal A, Singh A. Management of foreign bodies in the maxillofacial region: Diagnostic modalities, treatment concepts with report of two cases. *J Head Neck Physicians Surg* 2015;3(2):15–22.
3. Wilmott SE, Ikeagwuani O, McLeod NMH. An orthodontic bracket embedded in the medial pterygoid surface: A case report. *J Orthod* 2016;43(1):65–7.
4. Dibiasi AT, Samuels RH, Ozdiler E, Akcam MO, Turkkahraman H. Hazards of orthodontics appliances and the oropharynx. *J Orthod* 2000;27(4):295–302.
5. 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(11):592–6.
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; 8:245–52.
7. Hoseini M, Mostafavi SMS, Rezaei N, Boluri EJ. Orthodontic wire ingestion during treatment: Reporting a case and

- review the management of foreign body ingestion or aspiration (emergencies). Case Rep Dent 2013; 2013:426591.
8. Puryer J, McNamara C, Sandy J, Ireland T. An ingested orthodontic wire fragment: A case report. Dent J (Basel) 2016;4(3):24.
 9. Perry RT. An imbedded orthodontic arch wire. Tex Dent J 1987;104(6):20–1.
 10. Killingback N, Stephens CD. A little distal archery. Br J Orthod 1988;15(2):121–2.
 11. Park E, Bromwich M. Orthodontics-related foreign body causing trismus. J Can Dent Assoc 2011;77: b101.
 12. Bradford CB, Shroff B, Strauss RA, Laskin DM. A needle in a haystack: Report of a retained archwire fragment in the pterygomandibular space. Am J Orthod Dentofacial Orthop 2019;155(6):881–5.
 13. Lee TYT, Zaid WS. Broken dental needle retrieval using a surgical navigation system: A case report and literature review. Oral Surg Oral Med Oral Pathol Oral Radiol 2015;119(2): e55–
 14. Khandelwal P, Dhupar V, Akkara F, Hajira N. Impacted foreign bodies in the maxillofacial region – A series of three cases. J Cutan Aesthet Surg 2018;11(4): 237–40.
 15. Sencimen M, Bayar GR, Gulses A. Removal of the retained suture needle under C-arm fluoroscopy: A technical note. Dent Traumatol 2010;26(6):527–9.
 16. Siessegger M, Mischkowski RA, Schneider BT, Krug B, Klesper B, Zöller JE. Image guided surgical navigation for removal of foreign bodies in the head and neck. J Craniomaxillofac Surg 2001;29(6):321–5.
 17. Umesan UK, Ahmad W, Balakrishnan P. Laryngeal impaction of an archwire segment after accidental ingestion during orthodontic adjustment. Am J Orthod Dentofacial Orthop 2012;142(2):264–8.
 18. de Barros Melo MN, Pantoja LN, de Vasconcellos SJDA, Sarmiento VA, Queiroz CS. Traumatic foreign body into the face: Case report and literature review. Case Rep Dent 2017; 2017:3487386.
 19. Marks RB, Carlton DM, McDonald S. Management of a broken needle in the pterygomandibular space: Report of case. J Am Dent Assoc 1984;109(2):263–4.
 20. Ribeiro L, Ramalho S, Gerós S, Ferreira EC, Faria e Almeida A, Condé A. Needle in the external auditory canal: An unusual complication of inferior alveolar nerve block. Oral Surg Oral Med Oral Pathol Oral Radiol 2014;117(6): e436–7.
 21. Karakida K, Takahashi M, Sakamoto H, Nakanishi Y, Tamura M. Subcutaneous migration of a broken dental needle from the mandibular gingiva to the neck: A case report. Tokai J Exp Clin Med 2020; 45(3):108–12.
 22. Nicolas R, Eggers G, Komposch G. Orthodontic archwire in the nasal cavity. A case report. J Orofac Orthop 2009;70(1):92–7.
 23. Gui H, Yang H, Shen SGF, Xu B, Zhang S, Bautista JS. Image-guided surgical navigation for removal of foreign bodies in the deep maxillofacial region. J Oral Maxillofac Surg 2013;71(9):1563–71.
 24. Watanabe T, Yamazaki A, Fukuhara S, Yamanaka S, Nakao K. A piece of orthodontic archwire in the buccal mucosa. Int J Case Rep Images 2023;14(2):37–41.

How to cite this article: Gauranshi Gupta, Shailendra S. Chauhan, Aditya Sinha, Satendra Sharma, Radha. Management of embedded lingual holding arch (orthodontic appliance) in mandibular arch by electrocautery: a case report. *International Journal of Research and Review*. 2025; 12(2): 206-211. DOI: <https://doi.org/10.52403/ijrr.20250224>
