

SS-004 — Upper Airway Edema Following Intranasal *Ecballium elaterium*: An Emergency Department Case

Intranazal *Ecballium elaterium* Kullanımı Sonrasında Üst Havayolu Ödemi: Acil Servis Olgusu

Yazarlar / Authors (onaylı sıra): Talha Gökber Durmuş, Hasan Büyükaslan

Sunumu yapan / Presenting author: Talha Gökber Durmuş

Çalışma türü / Manuscript type: Olgu sunumu / Case report

Bilim ve Yayın Kurullarının kabul ettiği tam metin. İçerik ve kaynakçalar gönderilen metinlere dayanır.

Upper Airway Edema Following Intranasal *Ecballium elaterium*: An Emergency Department Case

Talha Gökber Durmuş¹, Hasan Büyükaslan¹

¹ Department of Emergency Medicine, Harran University Faculty of Medicine, Şanlıurfa, Türkiye

Abstract

Introduction

Ecballium elaterium, commonly known as squirting cucumber, grows widely in the Mediterranean region and has long been used as a traditional remedy. However, intranasal use of its fruit juice can cause marked irritation and swelling of the nasal and upper airway mucosa. Here, we describe a patient who developed uvular and oropharyngeal edema after intranasal exposure to *E. elaterium*.

Case Presentation

A 22-year-old patient with no known medical history presented to the emergency department with shortness of breath and a burning sensation in the nose after applying *E. elaterium* drops into both nostrils to induce sneezing. On arrival, the patient was hemodynamically stable. Blood pressure was 117/76 mmHg, heart rate was 75 beats/min, and oxygen saturation was 97%. Examination of the oropharynx revealed marked hyperemia and edema. Treatment with nebulized epinephrine, intravenous pheniramine, corticosteroid, and isotonic saline was initiated.

The patient was evaluated by the otolaryngology team because of concern about upper airway involvement. Examination showed uvular edema, hypertrophic nasal turbinates, and allergic secretions. Despite the edema, the airway was patent and the vocal cords were normal and mobile. Anesthesiology was also consulted for airway evaluation. During follow-up, the patient remained hemodynamically stable, with an oxygen saturation of 99%. Swallowing improved after treatment, although some difficulty persisted.

Discussion

Upper airway reactions following intranasal exposure to *E. elaterium* have been reported previously. The exact mechanism remains uncertain, and both an allergic response and direct irritation of the mucosa have been suggested. Most reported patients recover with medical treatment; however, swelling of the uvula and oropharynx can potentially progress and threaten the airway. For this reason, the initial appearance of clinical stability should not lead to underestimation of airway involvement. Careful examination and repeated assessment are particularly important when dyspnea or dysphagia is present.

Conclusion

Intranasal exposure to *E. elaterium* can result in significant uvular and oropharyngeal edema. Importantly, normal vital signs and preserved oxygen saturation do not exclude potentially important upper airway involvement. A history of herbal or traditional remedy use should therefore be considered in patients presenting to the emergency department with otherwise unexplained acute upper airway symptoms.

Keywords: *Ecballium elaterium*; squirting cucumber; uvular edema; oropharyngeal edema; herbal toxicity

Tam metin

Upper Airway Edema Following Intranasal *Ecballium elaterium*: An Emergency Department Case

1. Introduction

Ecballium elaterium (L.) A. Rich., commonly known as squirting cucumber, is a member of the Cucurbitaceae family and grows widely in the Mediterranean region. Its fruit juice has been used in traditional medicine for various inflammatory conditions, particularly sinonasal complaints, and this practice is also encountered in Türkiye [1,2].

Cucurbitacins are considered the main biologically active constituents of *E. elaterium*. Cucurbitacin B has shown anti-inflammatory activity in experimental studies [3–5], whereas other cucurbitacins isolated from the plant have demonstrated cytotoxic effects [1,6]. Intranasal use, especially when the juice is undiluted, has been associated with local irritation and edema involving the nasal and oropharyngeal mucosa. Uvular edema, dysphagia, dyspnea, and nasal swelling have all been reported [7,8].

The mechanism underlying these reactions remains unclear. Findings suggesting hypersensitivity have been reported in some patients, while severe mucosal irritation and even nasal necrosis in others indicate that direct local toxicity may also be involved [8,9]. We present a patient who developed uvular and oropharyngeal edema after intranasal use of *E. elaterium*, with particular attention to airway assessment and clinical observation in the emergency department.

2. Case Presentation

A 22-year-old patient with no known medical history presented to the emergency department with shortness of breath and a burning sensation in the nose after applying *Ecballium elaterium* drops into both nostrils to induce sneezing.

At presentation, the patient was hemodynamically stable, with a blood pressure of 117/76 mmHg, heart rate of 75 beats/min, and peripheral oxygen saturation of 97%. Examination showed marked hyperemia and edema of the oropharynx. Nebulized epinephrine, intravenous pheniramine, corticosteroid therapy, and intravenous isotonic saline were administered.

Given the possibility of upper airway involvement, an otolaryngology consultation was obtained. Examination revealed uvular edema, hypertrophic nasal turbinates, and allergic secretions. The airway remained patent, and the vocal cords were normal and mobile. Anesthesiology was also consulted to assess the airway.

During follow-up, the patient remained hemodynamically stable, and oxygen saturation increased to 99%. Swallowing improved after treatment, although some difficulty persisted.

3. Discussion

Upper airway reactions after intranasal use of *Ecballium elaterium* have been described in several reports, with presentations ranging from local nasal irritation to marked uvular and oropharyngeal edema [7,8]. Our patient developed nasal burning and dyspnea shortly after exposure, and examination revealed oropharyngeal hyperemia, uvular edema, and difficulty swallowing.

Cucurbitacins are thought to account for many of the biological effects of *E. elaterium*. Although anti-inflammatory properties have been demonstrated for some of these compounds [3–5], cytotoxic effects have also been reported [1,6,10]. This may partly explain the mucosal injury seen after intranasal exposure. The concentration and amount of the preparation are also likely to influence the severity of the reaction.

The exact mechanism of upper airway edema remains uncertain. Raikhlin-Eisenkraft and Bentur described pharyngeal edema, dyspnea, drooling, and dysphagia after *E. elaterium* exposure and suggested that undiluted juice may have a direct irritant effect on the mucosa [7]. Kloutsos et al., in a series of 42 patients, reported uvular and nasal mucosal edema as common findings. Positive allergy tests in some patients suggested that hypersensitivity may also play a role [8]. In contrast, the severe uvular edema and nasal mucosal necrosis reported by Eken et al. are more suggestive of direct tissue injury [9]. In our patient, the allergic secretions and uvular edema could indicate hypersensitivity, while nasal burning and mucosal hyperemia also favor a local irritant effect. Both mechanisms may have contributed.

The severity of airway involvement varies considerably. Life-threatening uvular angioedema has been reported following intranasal exposure to undiluted *E. elaterium* [11], while other cases have involved severe nasal obstruction and uvular edema [12,13]. Although our patient's airway remained patent and the vocal cords were normal and mobile, clear uvular and oropharyngeal edema was present. The initial oxygen saturation was 97%. This is clinically important because **normal vital signs and preserved oxygen saturation do not exclude clinically significant upper airway involvement**. Oxygen saturation may remain normal while substantial anatomical edema is already present. Persistent difficulty swallowing should also be taken seriously, as airway edema may progress over time.

In this case, otolaryngologic examination was useful in assessing the extent of edema and confirming airway patency and normal vocal cord mobility. Anesthesiology was also consulted because further progression might have required airway intervention. However, advanced airway management is not routinely necessary. None of the 42 patients reported by Kloutsos et al. required intubation or tracheotomy [8]. The decision to secure the airway should therefore depend on the clinical course and repeated airway findings.

Our patient was treated with nebulized epinephrine, intravenous pheniramine, corticosteroid therapy, and isotonic saline. Corticosteroids and antihistamines have also been used in previous reports [7,8,12]. Since the available evidence is largely limited to case reports and retrospective series, there is no established treatment protocol specific to *E. elaterium* toxicity. Careful observation and repeated airway assessment remain important regardless of the medical treatment given.

Several severe reactions have occurred after exposure to undiluted preparations [7,9,11], although the concentration and amount used by our patient were not known. Most previously reported patients used *E. elaterium* for sinusitis or related sinonasal complaints [3,5,8,11], whereas our patient used it to induce sneezing. This difference is noteworthy and shows that adverse

reactions are not limited to its traditional therapeutic use. Asking specifically about herbal remedies may be helpful when evaluating patients with otherwise unexplained acute upper airway symptoms.

The main limitations of this report are the lack of information on the amount and concentration of the preparation, the interval between exposure and symptom onset, medication doses, allergy history, duration of observation, laboratory findings, and final disposition. These missing data were not inferred.

4. Conclusion

Intranasal *Ecballium elaterium* exposure may cause clinically significant uvular and oropharyngeal edema through allergic and/or direct toxic-inflammatory mechanisms. In our patient, substantial upper airway edema was present despite hemodynamic stability and an initial oxygen saturation of 97%. **Normal vital signs and preserved oxygen saturation do not exclude clinically significant upper airway involvement.** Careful airway examination and serial reassessment are therefore important, with otolaryngology and anesthesiology consultation when clinically indicated. A history of intranasal herbal or traditional remedy use should also be sought in patients presenting with otherwise unexplained acute upper airway symptoms.

References

- 1 Anzano A, de Falco B, Grauso L, Lanzotti V. Squirting cucumber, *Ecballium elaterium* (L.) A. Ritch: an update of its chemical and pharmacological profile. **Molecules**. 2024;29(18):4377. doi:10.3390/molecules29184377. PMID:39339372.
- 2 Kültür S. Medicinal plants used in Kırklareli Province (Turkey). **J Ethnopharmacol**. 2007;111(2):341-364. doi:10.1016/j.jep.2006.11.035. PMID:17257791.
- 3 Yesilada E, Tanaka S, Sezik E, Tabata M. Isolation of an anti-inflammatory principle from the fruit juice of *Ecballium elaterium*. **J Nat Prod**. 1988;51(3):504-508. doi:10.1021/np50057a008. PMID:3404148.
- 4 Yesilada E, Ustün O, Sezik E, Takaishi Y, Ono Y, Honda G. Inhibitory effects of Turkish folk remedies on inflammatory cytokines: interleukin-1 α , interleukin-1 β and tumor necrosis factor α . **J Ethnopharmacol**. 1997;58(1):59-73. doi:10.1016/S0378-8741(97)00076-7. PMID:9324006.
- 5 Uslu C, Karasen RM, Sahin F, Taysi S, Akcay F. Effect of aqueous extracts of *Ecballium elaterium* Rich. in the rabbit model of rhinosinusitis. **Int J Pediatr Otorhinolaryngol**. 2006;70(3):515-518. doi:10.1016/j.ijporl.2005.07.020. PMID:16191438.
- 6 Jafargholizadeh N, Zargar SJ, Yassa N, Tavakoli S. Purification of cucurbitacins D, E, and I from *Ecballium elaterium* (L.) A. Rich fruits and study of their cytotoxic effects on the AGS cell line. **Asian Pac J Cancer Prev**. 2016;17(10):4631-4635. doi:10.22034/APJCP.2016.17.10.4631. PMID:27892675.
- 7 Raikhlin-Eisenkraft B, Bentur Y. Ecbalium elaterium (squirting cucumber)—remedy or poison? **J Toxicol Clin Toxicol**. 2000;38(3):305-308. doi:10.1081/CLT-100100936. PMID:10866331.
- 8 Kloutsos G, Balatsouras DG, Kaberos AC, Kandiloros D, Ferekidis E, Economou C. Upper airway edema resulting from use of *Ecballium elaterium*. **Laryngoscope**. 2001;111(9):1652-1655. doi:10.1097/00005537-200109000-00030. PMID:11568622.
- 9 Eken C, Ozbek K, Yildirim CK, Eray O. Severe uvular edema and nasal mucosal necrosis due to Ecbalium elaterium (squirting cucumber): an allergic reaction or direct toxic effect? **Clin Toxicol (Phila)**. 2008;46(3):257-258. doi:10.1080/15563650601158834. PMID:18344108.
- 10 Jafargholizadeh N, Zargar SJ, Aftabi Y. The cucurbitacins D, E, and I from *Ecballium elaterium* (L.) upregulate the LC3 gene and induce cell-cycle arrest in human gastric cancer cell line AGS. **Iran J Basic Med Sci**. 2018;21(3):253-259. doi:10.22038/IJBMS.2018.25175.6236. PMID:29511491.
- 11 Satar S, Gokel Y, Toprak N, Sebe A. Life-threatening uvular angioedema caused by Ecbalium elaterium. **Eur J Emerg Med**. 2001;8(4):337-339. doi:10.1097/00063110-200112000-00018.
- 12 Caiozzi G, Cabrera D, Mardóñez JM, Saldías F. Herbal medicines and severe adverse effects: uvular angioedema caused by Ecballium elaterium. **Rev Med Chil**. 2002;130(12):1407-1410. PMID:12611242.
- 13 Aydogan K, Yazici S, Turan H. A rare reason for uvular angioedema: Ecbalium elaterium. **Ann Dermatol**. 2012;24(3):358-359. doi:10.5021/ad.2012.24.3.358. PMID:22879724.