

BEYOND MASTICATION: ROLE OF PROSTHETIC REHABILITATION IN AEROPHAGIA- A CASE REPORT

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ABSTRACT

Oral Cavity has always been considered as the mirror of our body. With that in consideration, persistent hiccups that don't resolve with conventional medical management remain a diagnostic puzzle for clinicians. Although typically gastrointestinal or neurological issues have been found as contributing factor, compromised oral anatomy should also be considered. This case report explores a clinical presentation in which edentulism and reduced jaw support appeared to play a contributing role in recurrent hiccups and associated abdominal symptoms. When standard investigations and specialist consultations failed to identify a systemic cause, attention was redirected toward the patient's marked oral functional impairment. Prosthetic rehabilitation, specifically the restoration of posterior occlusal support, led to the unexpected and complete resolution of both the persistent hiccups and gastrointestinal complaints. The findings suggest that restoring oral function through prosthodontic intervention may offer relief in selected patients with aerophagia where conventional approaches have proven ineffective.

KEYWORDS- Aerophagia; Partial edentulism; Prosthetic rehabilitation; Removable partial denture; Vertical dimension

INTRODUCTION

Hiccups, also known as singultus, are sudden, involuntary spasmodic contractions of the diaphragm and intercostal muscles, followed by closure of the glottis. Although usually transient and self-limiting, persistent hiccups may significantly affect quality of life and warrant clinical evaluation, as they may be associated with various gastrointestinal, neurological, or metabolic disorders.¹ Severity of such episodes can be assessed using tools such as the Numeric Rating Scale (NRS), where patients rate the intensity of their symptoms on a scale of 0 to 10.²

Aerophagia is one such functional gastrointestinal disorder, characterized by excessive swallowing of air, leading to symptoms such as abdominal distension, bloating, and frequent belching.¹ Epidemiological data on aerophagia remain largely confined to paediatric populations; a systematic review and meta-analysis of over 40,000 children and adolescents reported a pooled prevalence of approximately 3.66%, with no significant difference between sexes.³ In contrast, adult aerophagia remains comparatively understudied, in part because it was removed from the Rome IV diagnostic criteria for adults and is now classified only under pediatric functional gastrointestinal disorders.⁴ Consequently, reliable estimates of its prevalence and any sex-based predisposition in adult populations are currently lacking. This gap in adult-specific epidemiological data underscores the value of individual case documentation, such as the present report, in furthering clinical understanding of the condition beyond childhood.

Although a direct association between aerophagia and edentulism has not been well established in the literature, anatomical and functional alterations within the oral and pharyngeal regions may influence swallowing dynamics and airway patency.⁵ Edentulism, particularly when associated with loss of posterior occlusal support and reduced vertical dimension, may alter mandibular posture and tongue position, thereby compromising the upper airway space and affecting normal oral functions such as mastication and swallowing.^{5,6} These changes may predispose susceptible individuals to excessive air intake.

Restoration of posterior occlusal support and vertical dimension using prosthetic rehabilitation may improve oral function and airway dynamics, thereby possibly alleviating such symptoms. Thus, this case report is an attempt

to bridge the gap in the literature by highlighting the possible role of prosthetic rehabilitation in improving oral function and potentially reducing excessive air intake.

CASE PRESENTATION

A 64-year-old female presented with a complaint of persistent hiccups since 1 year. The patient was apparently alright 1 year ago when she started experiencing hiccup episodes, occurring approximately 8–10 times per day. Over time there was a gradual increase in the frequency of the hiccups, reportedly 20–25 times per day, which were aggravated post meals and temporarily relieved on intake of water. The episodes were recurrent and progressive in nature, interfering with routine social activities and intake of food. On a Numeric Rating Scale (NRS)², the patient rated the severity of the hiccups as 8/10. She also gave a history of gastrointestinal discomfort associated with abdominal bloating, for which she had been on proton pump inhibitor therapy (pantoprazole 40 mg) with minimal symptomatic relief. Additionally, she reported abdominal bloating and gastrointestinal discomfort of unspecified duration, for which she had been receiving proton pump inhibitor therapy (pantoprazole 40 mg) with only minimal relief of symptoms. No history of nausea, vomiting, dysphagia, fever, altered bowel habits, or neurological symptoms was elicited. Her medical history was significant for type 2 diabetes mellitus, for which she had been on metformin 500 mg for 4 years.

The general examination was noted to be unremarkable. Upon intraoral examination, multiple missing teeth were noted in both the maxillary and mandibular arches, along with generalized attrition, resulting in loss of posterior occlusal support and a reduced vertical dimension. (Figure 1) No mucosal lesion or signs of acute infection were evident. On examination of the oropharynx, the uvula appeared normal in size and position. Tongue movements were within normal limits, and the palatopharyngeal arches appeared normal in morphology, with no evidence of tonsillar enlargement or any other significant abnormality. The patient was referred to the Department of Otorhinolaryngology to rule out any posterior pharyngeal or laryngeal pathology, and no significant abnormality was noted.

Routine haematological investigations were within normal limits, except for an elevated glycated haemoglobin level of 7.1% and elevated total cholesterol and triglyceride levels. Considering the history of abdominal bloating and persistent hiccups in the presence of compromised oral function, aerophagia was considered as the working diagnosis.

In the view of compromised oral function and reduced vertical dimension, the patient was referred to the Department of Prosthodontics for rehabilitation.

Owing to the near-edentulous state, the poor prognosis of the remaining teeth from multiple carious lesions, and the need for comprehensive restoration of posterior occlusal harmony, full-mouth rehabilitation was planned, comprising a complete denture for the lower arch and a partial denture for the upper arch.

Owing to their poor prognosis, the remaining mandibular teeth were extracted atraumatically, and the patient was given adequate time to heal. Primary impressions were subsequently made, and all clinical and laboratory procedures were completed in standard fashion. The patient was then rehabilitated with a complete denture for the lower arch and a partial denture for the upper arch, following which she was placed under regular follow-up to monitor symptom remission. The patient was rehabilitated with a complete denture for the lower arch and a partial denture for the upper arch (Figure 2). After this, the patient was kept under regular follow-up to assess remission of symptoms.

Follow-up was conducted twice weekly for the first month, weekly for the following two months, and then monthly for four months thereafter. At the first follow-up visit, the patient reported requiring some time to adapt to the denture; however, she noted a slight reduction in hiccup frequency, from 20–25 episodes per day to 10–15 episodes per day, with the NRS score decreasing from 8/10 to 6/10. At the one-month follow-up, she reported a significant reduction in hiccup frequency to 4–5 episodes per day, with the NRS² score further decreasing from 6/10 to 2/10, along with improved mastication and reduced abdominal discomfort. By the end of the second month of follow-up, the frequency of hiccups had decreased further to occasional episodes, occurring once every 1–2 days. By the end of four months, the patient reported near-total resolution of hiccup episodes as well as resolution of bloating and gastrointestinal discomfort. Her quality of life improved remarkably, as she no longer experienced social embarrassment or difficulty eating due to incessant hiccups.



FIGURE 1- Intraoral view showing partial edentulism with multiple missing posterior teeth, generalized attrition, and reduced vertical dimension of occlusion.



FIGURE 2- Occlusal view of the mandibular arch demonstrating the complete mandibular denture following prosthetic rehabilitation.

DISCUSSION

In this patient, persistent hiccups occurring in the setting of near-edentulism and aerophagia-related bloating — with structural causes excluded on ENT evaluation — point toward a mechanistic link between compromised oral function and the hiccup reflex, discussed below.

The hiccup reflex is governed by a three-part neural arc: afferent signalling via the vagus and phrenic nerves, central integration in the brainstem, and efferent output to the diaphragm.⁷ Gastric distention, oesophageal irritation, or intrathoracic pressure shifts can activate this arc, producing the characteristic abrupt diaphragmatic contraction and glottic closure.⁷ In persistent hiccups, gradual accumulation of swallowed air is a well-recognized trigger⁸ air trapped in the stomach distends the gastric wall, directly irritating the diaphragm and provoking the reflex.^{2,8} This patient's clinical pattern fit neatly into that framework — her hiccups worsened after meals and were accompanied by bloating that remained largely unresponsive to proton pump inhibitor therapy, a combination more consistent with aerophagia-driven gastric distention than with a primary acid-related process.

Edentulism compounds this risk through its effects on airway and pharyngeal anatomy. Loss of posterior occlusal support and reduced vertical dimension can compromise airway patency,⁹ while mandibular retrusion displaces the tongue and soft palate posteriorly, narrowing the oropharyngeal airway and disrupting swallowing coordination.^{10,11} In dentate individuals, the mandible, tongue, hyoid bone, and larynx operate in tight synchrony during swallowing¹²; in edentulous patients, this coordination breaks down, and laryngeal penetration occurs with greater frequency.¹² The resulting loss of an effective oral seal opens the door to unconscious, habitual air swallowing. This patient's near-edentulous state, generalized attrition, and substantially reduced vertical dimension offered a clear anatomical substrate for exactly this kind of impaired oral seal and disrupted swallowing coordination — strengthening the case for aerophagia as the mechanistic bridge between her oral findings and her hiccups.

If edentulism creates the anatomical conditions for aerophagia, prosthetic rehabilitation offers a logical route to reversing them. Restoring posterior occlusal support and vertical dimension can reposition the mandible more anteriorly, allowing the tongue to resume a more physiological forward posture and enlarging the oropharyngeal airway.^{5,13,14} This, in turn, improves bolus formation and facilitates smoother swallowing,¹⁵ while restored vertical dimension may additionally enhance pharyngeal muscle tone — together narrowing the window for unconscious air intake. The present case tracked this proposed mechanism closely: hiccup frequency fell in a stepwise fashion from 20–25 episodes daily at baseline to 10–15 at first follow-up, then to 4–5 at one month, and ultimately to near-total resolution by four months, with NRS severity scores declining in parallel from 8/10 to 2/10 alongside resolution of bloating and gastrointestinal discomfort. This progressive, sustained improvement occurring without any other change to her medical regimen offers meaningful clinical support for prosthetic rehabilitation as a viable therapeutic strategy in aerophagia-induced hiccups among edentulous patients.

These findings should nonetheless be interpreted with caution. As a single case report, this observation cannot establish generalizability or prove causation; the temporal link between rehabilitation and symptom resolution, while compelling, does not exclude spontaneous remission or other unmeasured contributing factors. The absence of objective pre- and post-rehabilitation measures of swallowing mechanics or gastric air content is a further limitation, leaving the proposed mechanism inferential rather than directly confirmed. Larger prospective studies, incorporating standardized swallowing assessments and direct measurement of air intake, are needed to validate this association and clarify its broader clinical relevance.

CONCLUSION

This case highlights an uncommon link between edentulism and a seemingly idiopathic persistence of hiccups and gastric discomfort. The progressive resolution of symptoms following prosthetic rehabilitation suggests a possible relationship between the patient's compromised dental anatomy and the manifestation of her persistent hiccups and associated aerophagia-related symptoms. However, larger prospective studies are needed to validate these observations and establish the prevalence of the association between edentulism and aerophagia.

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