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Betel quid, chewing habits and difficult intubation: A case report and critical appraisal of evidence for practice

[P. L. Narendra](#), [Harihar V. Hegde](#),¹ [T. K. Vijaykumar](#), and [Samson Nallamilli](#)²

Department of Anesthesiology, Shri B. M. Patil Medical College Hospital and Research Centre, BLDE University, Bijapur, India

¹Department of Anesthesiology, SDM College of Medical Sciences and Hospital, Dharwad, Karnataka, India

²Department of Anaesthesia and Intensive Care, Queen Elizabeth Hospital, London, England

Corresponding author: Dr. Narendra P. L., Department of Anesthesiology, Shri B. M. Patil Medical College Hospital and Research Centre, BLDE University, Bijapur - 586 103, Karnataka, India. E-mail: purohit72@gmail.com

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Abstract

Betel quid is used by 10–20% of world of population. Oral submucous fibrosis (OSF) is a chronic premalignant disease common in South Asian countries where betel quid is chewed. It is characterized by juxtaepithelial fibrosis of oral cavity and limited mouth opening, which can cause difficult intubation. A recent study in Taiwan has revealed long-term betel nut chewing is not predictor of difficult intubation. We describe two cases of OSF and critically analyze this study and its implications for clinical practice. OSF is now seen in Saudi Arabia and western countries with use of commercial betel quid substitutes. Although betel quid without tobacco is used in Taiwan, available evidence suggests rapid and early development of OSF where commercial chewing products like Pan Masala are used in India. Effects of betel quid may vary depending on the composition of quid and chewing habits. Studies where personal habits are involved must be analyzed carefully for external validity. Even though, Taiwan study is controlled, its validity outside Taiwan is highly questionable. Since OSF can cause unanticipated difficult intubation, thus during preanesthetic assessment, history of betel quid chewing, more importantly use of commercial chewing products is more likely to give clues to severity of OSF and possible difficult intubation. Further controlled trails in populations where commercial chewing products are used is necessary to detect association of chewing habits and difficult intubation.

Keywords: Betel quid, chewing habits, difficult intubation, evidence, fibrosis

INTRODUCTION

Betel quid use and other chewing habits are common in South Asian countries. In India, an average of 30% of men chew betel quid and globally up to 600 million users chew areca nut.[1] Oral submucous fibrosis (OSF), associated with betel quid chewing, is characterized by juxtaepithelial fibrosis of the oral cavity and limited mouth opening which can cause difficult intubation.[2,3] Earlier limited to India, OSF is now reported in Saudi Arabia, South Africa and western countries such as UK and USA.[2,4] The incidence of OSF is likely to increase in western countries due to increasing immigrant population. Until date, there is only one controlled study on betel quid and difficult intubation. This study in Taiwan has revealed long-term betel nut chewing is not a predictor of difficult intubation.[5] We describe two prototype cases of OSF manifesting with difficult intubation and critically analyze this study and its implications for clinical practice with specific reference to chewing habits.

CASE REPORTS

Case 1

The 28-year-old male was scheduled for diagnostic laparoscopy. His mouth opening was one finger breadth with Mallampatti class IV airway and was planned for fibreoptic intubation. Airway anesthesia was achieved with 4% lignocaine nasal sponges, 3 mL lignocaine viscous 2% gargle and 2 mL transtracheal lignocaine 2%. Awake intubation was performed via 4.1 mm fiberoptic bronchoscope (Pentax[®]) with supplemental propofol 30 mg. General anesthesia was induced with propofol 90 mg, vecuronium 4 mg intravenous (IV) and maintained with O₂/N₂O/isoflurane. Extubation was uneventful.

Case 2

A 25-year-old male was scheduled for emergency laparotomy. He had Mallampatti class II airway with mild restriction of mouth opening. Rapid sequence induction was done with propofol 100 mg and suxamethonium 100 mg IV. Direct laryngoscopic view was Cormack–Lehane Grade III, epiglottis small, stiff, transversely folded. Both 8.0 mm and 7.0 mm endotracheal tubes failed to pass with a bougie. Finally, he was intubated with 6.5 mm tube over a bougie passed blindly below epiglottis. Anesthesia was maintained with O₂/N₂O/isoflurane and extubated uneventfully.

Review of literature

For anticipated airway difficulty in OSF (case 1), fiber optic intubation is the technique of choice.[3] Unanticipated difficult intubation (case 2), is reported with submucous fibrosis involving epiglottis and fixation of left hemilarynx.[6] Preoperative indirect laryngoscopy has been suggested, but history of chewing habit is important to undertake this. Eipe has reviewed anesthetics of 44 patients with oral malignancies, and 8 had OSF. All had limitation of mouth opening before the diagnosis of oral malignancy. Four cases of OSF with IID of 30 mm, 30 mm, 10 mm and 5 mm respectively required preliminary laryngoscopy without muscle relaxants, nasal intubation with severe external laryngeal manipulation, awake fiberoptic intubation and tracheostomy under local anesthesia. Patients with oral malignancies and OSMF had increased requirement for fiberoptic endotracheal intubations (62.5%) compared with those without OSMF (44.4%).[3]

In another series 52 cases of fiberoptic intubations, OSF was the commonest cause of difficult intubation accounting for 24 of 52 cases (47%).[7]

Originally confined to India, OSF is now seen in other developed countries like UK, USA, South Africa and Saudi Arabia.[2,4] In a recent study in Saudi Arabia, chewing tobacco and betel nut was associated with potentially malignant lesions, including OSF. Premalignant lesions were associated with male gender, lower level of education, and a chewing tobacco habit. Prevalence of OSF was 0.5% of this study population similar to that in India.[4] Among Bangladeshi women, immigrants in UK, betel quid and other chewing habits were common in up to 30–90% and Gutka use in Indian immigrants in USA up to 24%. [1] OSF has been reported among South Asian immigrants in Canada, the United Kingdom, South Africa and Germany. [8] The incidence of OSF in USA is likely to increase due to rising in immigrant population.[9]

DISCUSSION

Both our patients used chewing products like Pan Masala/Gutka for more than 2–3 years. The only controlled study on betel quid and difficult intubation by Tsai *et al.* In Taiwan reveals that long-term betel nut chewing is not a predictor of difficult intubation.[5] 105 patients in betel nut chewing group (daily for more than 5 years) were compared with 113 in no betel nut chewing group. Cormack–Lehane Grade \geq III was found in 19% and 25% in betel nut chewing and no betel nut groups. Grade IV was found in 2.8% and 4.5% respectively.[5] Authors did not note composition of the quid. In a study of 1000 OSF cases from central India, mean frequency of chewing was 1.28 ± 4.03 /day and mean duration of chewing 1.4 ± 3.59 years [Table 1].[10] 48.3% of cases were Grade III OSF (20–29 mm) with average mouth opening of 24.62 mm while for direct laryngoscopy mouth opening of at least 30 mm is required.[3]

Although only two prototype cases are cited in this report, authors had the experience of 6 OSF cases causing either anticipated or unanticipated difficult intubation in the last 2 years. In another series of 20 OSF patients, mean preoperative inter incisal mouth opening for direct nasotracheal intubation (nine patients) was 15.44 mm, fiberoptic laryngoscopy (six patients) was 9.0 mm and blind nasal intubation (five patients) was 5.2 mm.[11]

The three types of quid used in Taiwan are lao-hwa quid, betel quid and stem quid which do not contain tobacco.[1] In India, tobacco and commercial chewing products like Gutka and Pan Masala are commonly used and these are exported from India to over 50 countries around the world.[1,12] Products like Gutka and Pan Masala have high concentrates of areca nut per chew and cause OSF more rapidly than by conventional betel quid.[13] In a South Indian study, all patients who developed OSF within 1 year were Pan Masala/Gutka chewers.[14] While some studies identify tobacco as a risk factor for OSF, others do not.[1,15] However, chewing tobacco plays a modifying role on the malignant transformation of OSF.[10] Despite a ban on products like Gutka, ingredients of tobaccoless products like betel quid and Pan Masala contain constituents that can still cause OSF or oral cancer. Furthermore, a “Gutka like” quid can be made by combining separately available tobacco less and tobacco products [Figure 1].

Arecoline, catechu and lime have been implicated in the pathogenesis of OSF. Commercial chewing products contain high copper, produce high reactive oxygen species (ROS) and lack protective effect of betel leaf in scavenging ROS.[12] In a recent case–control study, the odds ratio for developing OSF was higher in subjects with chewing frequency more than 2/day and odds ratio was higher for Pan Masala consumers than for tobacco/betel quid consumers (For tobaccoless Pan Masala 17.67 vs. 2.64 for betel quid on multivariate analysis, 6.88 vs. 4.24 on univariate analysis).[16] In a case–control study, the cut-off points for occurrence of OSF was 2 years for females and 3 years for males and in frequency of chewing, five and two quids per day respectively. Receiver operating curve analysis has revealed daily frequency to be the most important factor than other dose-response relationships like duration or cumulative effect.[17]

The studies of 1000 OSF cases and airway evaluation OSF in India reveal rapid, severe OSF in India. Thus, effects of betel quid on the airways may vary geographically depending on the composition of the quid and chewing habits. External validity of Taiwan study is highly questionable. Further controlled studies are required to assess chewing habits and difficult intubation in countries where betel quid substitutes are used.

Certain clinical clues might assist in diagnosing OSF during airway assessment. Early lesions appear as blanching of the mucosa, imparting a mottled, marble-like appearance whereas later lesions demonstrate palpable fibrous bands rendering the mucosa pale and thick and stiff.[18] Initially, most OSF patients present with a burning sensation or intolerance to spicy food, and they may have vesicles, particularly on the palate. Ulceration and dryness of the mouth is later followed by fibrosis of the oral mucosa. The most obvious clinical signs include blanched, opaque oral mucosa with palpable fibrous bands.[2]

Current preanesthesia assessment forms do have questions on tobacco, but not on betel quid use and tobacco chewing. Tobacco use, during the preanesthesia assessment, is invariably implied as smoking. Preoperative history of betel chewing may be useful to anesthetist in any part of the world.[19] However, use of commercial chewing products is more important to detect OSF. Thus, specific questioning on frequency, duration and use of commercial products like Gutka/Paan Masala must be routinely asked during pre assessment in all adults in asia and asian immigrants in the west.

CONCLUSION

Studies where personal habits like chewing are involved must be analyzed carefully for external validity. Since OSF can cause unanticipated difficult intubation, betel quid and chewing habits must be routinely asked during preassessment in all adults in Asia and Asian immigrants in the west. Specific questioning on frequency, duration and use of commercial products like Gutka/Pan Masala is more likely to give clues to the severity of OSF and possible difficult intubation.

Footnotes

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Conflict of Interest: None declared.

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Figures and Tables

Table 1

Habits	Frequency (per day)			Duration (years)		
	Malignant (n=33)	Nonmalignant (n=967)	P	Malignant (n=33)	Nonmalignant (n=967)	P
Areca nut	2±3	1.8±4.1	0.901	3.6±7.3	2.85±6.0	0.507
Tobacco	2.3±4.1	1.9±3.7	0.544	4.2±7.1	2.23±5.2	0.033
Kharra	3±3.1	2.8±6.8	0.995	4.2±5.9	2.50±3.4	0.015
Betel quid	1.2±2.7	0.3±1.3	0.001	2.4±6.2	0.74±3.2	0.006
Gutkha	4±8.4	3.6±6.3	0.752	2.6±4.6	2.35±3.6	0.731
Snuff	0.4±0.9	0.2±0.9	0.181	1.8±4.31	21±4.1	0.384
Smoking	3.4±6.9	1.0±3.6	0.001	2.9±7.3	1.07±3.5	0.005

Note early occurrence of non malignant OSF within one year of betel quid chewing and malignant transformation with of tobacco containing Gutka . More than 77% of these subjects had multiple habits. Also in this study posterior one third of tongue and retromolar area was predominantly affected. Average mouth opening in these cases was 24.62 mm .For direct laryngoscopy mouth opening of atleast 30 mm is required. Reproduced with permission from Hazarey et al. Journal of Oral Pathology and Medicine 2007;36:12-7. 2007 @2007 The Authors. Journal compilation @2007 Blackwell Munksgaard /E Copyright© John Wiley and Sons, Inc. All rights reserved. Values are given as mean±SD. SD=Standard deviation, OSF=Oral submucous fibrosis

Comparison of mean frequencies and durations of different habits in 1000 OSF cases from central India

Figure 1

Chewing products involved in Oral submucous fibrosis (OSF). Conventional betel quid (a) and commercial chewing products with tobacco, (b) now banned, without tobacco, (c) Commercial products contain more areca nut per chew. Note, separately available tobacco products, (d) that can be combined with conventional quid or other tobacco less products inset, (e) shows tobacco less products containing betel nuts, catechu and lime involved in OSF

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