Unusual Presentation of Caustic Ingestion and its Surgical Treatment: A Case Report

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Abstract Treatment and reconstruction of oral scar contracture, is always a challenging procedure to restore structure and functions of the oral cavity. We present a case of a patient with limited mouth opening who sustained extensive oral scar contracture with complete adhesion of tongue to floor of mouth following ingestion of caustic soda without his knowledge 4 years back. We performed a surgical release of the scar contractures from buccal mucosa on both sides, along with a release of the tongue from the floor of the mouth, followed by reconstruction of all sites using split skin grafts. Adequate mouth opening and tongue movement was achieved. There was a follow up period of 1 month with excellent mouth opening and tongue function.

Keywords Caustic soda · Post-burn contracture · Microstomia · Ankyloglossia · Split-skin graft

Introduction

The ingestion of chemical agents can cause serious damage to oral mucous membrane, lips and tongue followed by oral contracture. Accidental ingestion of caustic soda is fortunately rare; however, the consequences can be devastating.

Due to the same reasons; literature regarding oral scar contracture reconstruction remains scanty. Moreover, a majority of the published literature relating to caustic

ingestion are concerned with return of function of the strictured esophagus and stomach [1–3].

In our case, due to caustic soda ingestion, contracture of tongue was so severe that it adhered totally to the floor of mouth preventing any movement of the tongue. For such conditions, restoration of tongue function after releasing it is a surgical challenge.

Case Report

A 28-year old female reported to the department of Oral and Maxillofacial Surgery, in January 2009 with reduced mouth opening and almost no tongue movement, following accidental caustic soda ingestion since 4 years (Fig. 1). The past medical and surgical histories were not contributory. Extraoral examination were normal with reduced mouth opening. Intraorally there was scar extending from lip to the faucial pillars injury to the oropharynx and oesophagus was prevented because the patient spit the chemical.

On examination, there were vertical and circular fibrous bands present on the buccal mucosa on both the sides. On palpation, these fibrous band extended from the corner of mouth to molar region with obliteration of labial vestibule.

Routine haematological and biochemical investigations were within normal limits.

Procedure

After taking informed consent, the patient was operated under general anesthesia. Fibre optic nasotracheal intubation was used to anesthetizing the patient. The contracted scar tissue on the buccal mucosa was incised extending

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Fig. 1 Pre-operative photograph (complete adhesion of tongue to floor of the mouth and 1 cm mouth opening)

from commissures to the third molar region followed by submucosal dissection on both the sides. With release of contractures, a mouth opening of around 35 mm was achieved. This was followed by a release of the adhered tongue from the floor of the mouth. Split skin graft was taken from the left thigh and was placed on the both sides of buccal mucosa, and on the ventral surface of the tongue (Fig. 2A, B).

The post operative course was uneventful, with nearly complete graft uptake and no donor site morbidity. Active physiotherapy was started on the third post operative day. The patient was taught active jaw physiotherapy and discharged on the fourth post operative day. All the wounds underwent uneventful healing. The follow up period was 1 year post operatively. There was no recurrence reported. Mouth opening of 30 mm was achieved with excellent tongue movements (Fig. 3A, B).

Discussion

Ingestion of caustic material, may result in tissue and organ damage leading to a wide range of complications, including loss functions.

In general, alkalis are particularly destructive because of their lytic action on tissues. Depending on the type of alkali ingested, the distribution of chemical burns varies. Solid alkalis produce deep burns where they adhere to the oral mucosa, but they tend not to be swallowed and are usually spit out. In contrast, liquid alkalis can be easily swallowed and thus enter the esophagus. They produce liquefaction necrosis, which exposes progressively deeper layers of tissue to the caustic agent and produces much more extensive injuries.

Caustic substances cause tissue destruction through liquefaction or coagulation reaction and the intensity of destruction depends on type, concentration, time of contact

Fig. 2 **A** Post operative photograph of skin graft placed at buccal mucosa after excision of fibrous bands. **B** Intra-operative photograph of skin graft placed at ventral surface of tongue after releasing of tongue adhesion with the floor of the mouth

[1] and amount of the substance ingested [3]. Our patient held a liquid in her mouth but spit it out without swallowing. This resulted in oral scarring and contracture without oesophageal injury.

A number of reports of chemical burns are available in the literature. However, most published reports deal with immediate management of the patient in the Burns and Accident ward [1–4]. Further, majority of publications deal with the actual ingestion of caustic substances and the resultant injuries, that have concentrated on the effects to the trachea and gastrointestinal tract, with little reference to the oral and perioral areas [1–3, 5, 6]. Very few published reports deal with chemical burns of the oral cavity, and even fewer, that deal with delayed presentation [7, 8]. A pubmed search of indexed literature using the keywords “Caustic burns of oral cavity” showed a total of 83 published articles. Of these, only 18 dealt with injuries of the

Fig. 3 **A** Post-operative photograph with improved mouth opening. **B** 1 year post-operative photograph showing improved tongue movement and satisfactory graft uptake

oral cavity alone. Further, 7 of these dealt with delayed management of contractures of the oral mucosa. Only 3 reports describing the use of skin grafts for oral reconstruction were found [9–11]. Our patient presented with chemical burns restricted to the oral cavity alone, as she was able to spit the liquid out, avoiding any injuries distal to the oral cavity.

Restoring the function of the oral cavity in this situation can be a difficult surgical problem and requires thorough planning and clinical dexterity to accomplish a good result and avoid surgical difficulties, during intubation, or the grafting technique. Various treatment options may be offered to these patients, like topical and intralesional corticosteroids [4], commissuroplasties, bilateral buccal mucosal flaps [7], free radial forearm flap [12] and free jejunal graft [8]. Surgical repair using skin graft, however, also seems to be a good option. It is inexpensive, and simple to perform, and yet provides satisfactory cosmetic as well as functional results. Although skin grafts

occasionally tend to slough and cause secondary contraction, in our case it was vascularised and taken up smoothly.

Conclusion

Accidental caustic ingestion may have an unusual presentation and severe complications, but can have a favorable outcome.

Although several other techniques may be advocated, each having its own advantages and disadvantages, the presented procedure can be useful in peripheral centers. It involves a minimum of expense for the patient, and requires a bare minimum of facilities.

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