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TECHNICAL NOTE

Self-Retaining Decompression Stent

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Abstract
Background Decompression of odontogenic cysts is valuable in large cysts involving vital structures and cysts in pediatric and geriatric age-groups. The use of red rubber catheters, nasopharyngeal airways, intravenous tubing, nasal cannula tubing, and tuberculin syringes has been reported in catheterization of odontogenic cysts. These methods require some means of securing them to the tissues, like suturing or the use of screws.
Materials and Methods We propose a new technique of making a self-retaining decompression stent from pediatric endotracheal tube.
Conclusion The technique is simple and effective.

Keywords Decompression · Cyst · Stent

Introduction

Marsupialization of odontogenic cystic lesions has been described by various investigators since 1892, with decompression being described by Thoma in 1958. Marsupialization is the specific procedure in which the cyst lining is everted and sutured to the surrounding mucosa to form a cavity that can remain open. The term decompression includes marsupialization and is any technique that decreases the intraluminal pressure of a cystic cavity by maintaining an opening into the oral cavity [1].

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Decompression of odontogenic cysts is valuable in large cysts involving vital structures and in pediatric and geriatric age-groups. The use of red rubber catheters, nasopharyngeal airways, intravenous tubing, nasal cannula tubing, and tuberculin syringes have reportedly been used in catheterization of odontogenic cysts [2].

A catheter should satisfy at least the following criteria: (1) have a design that prevents it from falling into the bone cavity or coming out from it at the end of the procedure; (2) be small enough and not interfere with daily mastication; (3) be fixated easily to the soft tissue around it with sutures; (4) provide easy daily cleaning of the cystic cavity through its opening by the patient or staff; and (5) be hygienic and not accumulate food particles over the time of its function [3].

Failure of sutures and dislodgement of the stent during the 6–12-month follow-up period are common complaints by many surgeons. Failure of the stent has been attributed to inflammation of the soft tissue surrounding the stent, daily mastication, and daily manipulation for irrigation in combination with a decrease in tensile strength of the suture over time. This can be frustrating to the surgeon and the patient, leading to multiple operating room visits and a higher risk of postoperative morbidity [4].

Materials and Methods

A decompression stent is made using the endotracheal tube of an inner diameter of approximately 4.5 mm, which allowed adequate space for daily irrigation and prevented the accumulation of large food particles. The endotracheal tube is cut to approximately 3 cm. The end is slit into four equal parts (Fig. 1), and the edges are bent outward to form flanges. The flanges of the tube are pressed against the flat end of a heated instrument to get the desired flare (Fig. 2).

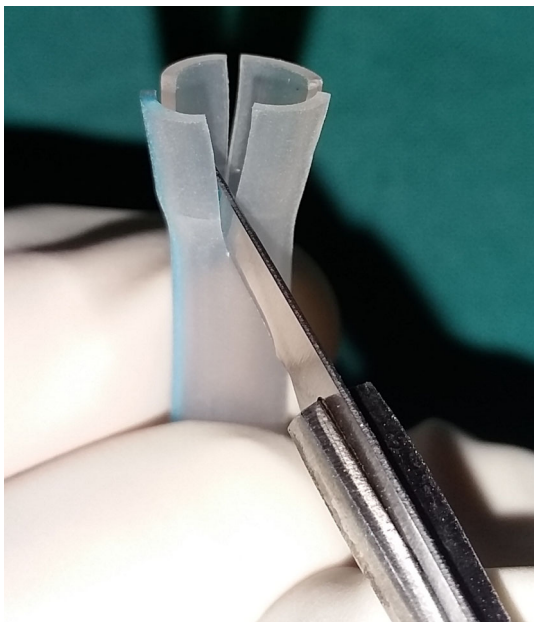

Fig. 1 End of the endotracheal tube is slit into four equal parts

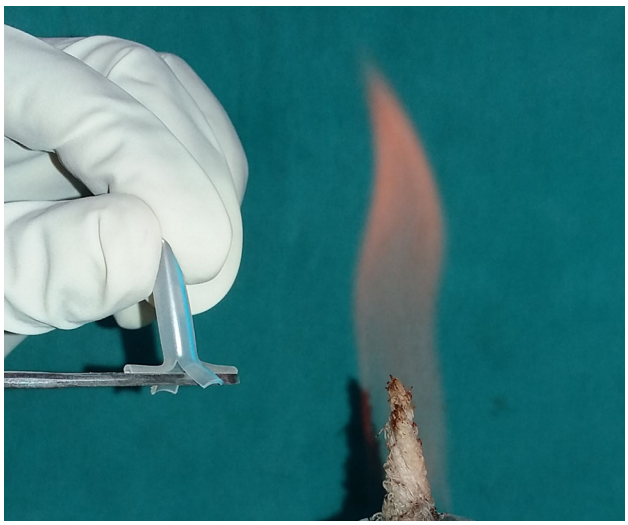

Fig. 2 Flanges of the tube are pressed against the flat end of a heated instrument to get the desired flare

The procedure is repeated on the other side (Fig. 3). This flange allows for fixation of the stent and prevention of dislodgement and also makes it self-retaining.

At the time of surgery, once the cyst has been accessed and an adequate-sized osteotomy window has been made, the stent is inserted (Fig. 4). The flanges are straightened and inserted using an artery forceps, and they open up once inside the cystic cavity. The proposed decompression technique does not require suturing or screw fixation. It also allows for adequate access and daily irrigation of the cyst during treatment. In the reported case, the patient was

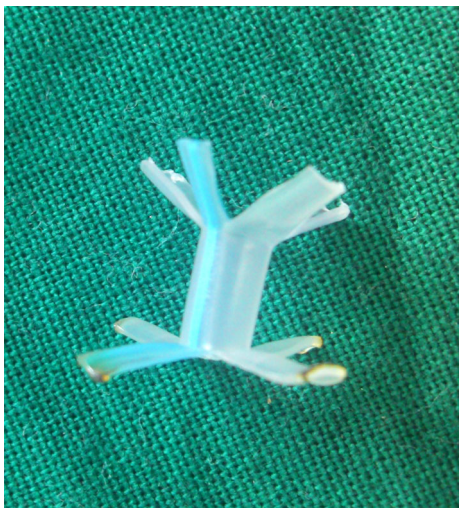

Fig. 3 Self-retaining decompression stent

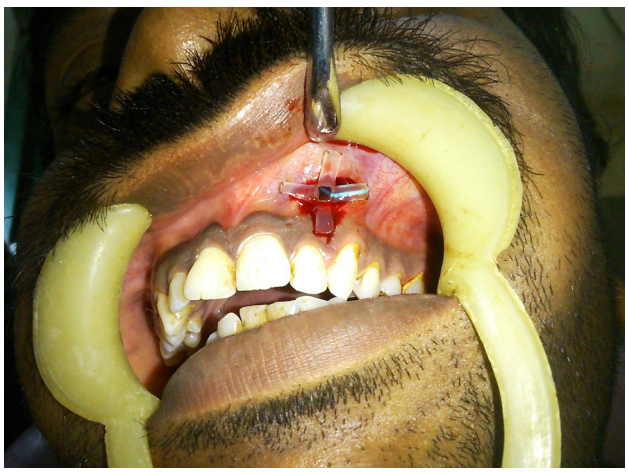

Fig. 4 Self-retaining decompression stent placed inside the cystic cavity

followed for 1 year with regular follow-up visits. During the follow-up period, the stent remained exposed to the oral cavity; there was no problem of soft tissue overgrowth or loss of patency.

Discussion

Various materials and methods have been used for the purpose of decompression stents [2]. In our experience, we have also used other materials like disposable syringe caps, Ryles tube, and suction catheter. Patient compliance with syringe cap as decompression stent was poor due to repeated mucosal injury because of its hardness. Some authors made a decompression stent using the suction tubing plastic connector and fixed it using screws [4]. Although the proposed decompression stent did remain patent and

allowed for shrinking of the cyst, overgrown mucosa had to be curetted from the lumen multiple times. Procedures like screw fixation to bone and suture fixation of the mucosa were required [4]. In the technique that we propose, we overcome these disadvantages. We also did not face problems of tissue overgrowth or loss of patency in 1-year follow-up. Patient compliance also was very good with no reported soft tissue injuries or ulcers.

Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflict of interest.

Patient Consent Informed and written consent was taken.

Ethical Standard Institutional ethical board committee clearance was obtained.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards.

Human and Animals Rights This article does not contain any studies with animals performed by any of the authors.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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