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TREATMENT MODALITIES OF OROANTRAL COMMUNICATION AND FISTULA

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Abstract
The oroantral communication and fistula is an epithelialized pathological communication between the maxillary sinus and the oral cavity (antrum; oral) which may be located iatrogenically or of any pathological origin. This may occur as complications after tooth extraction, due to the presence of oroantral communication, or may be present due to a hole in the sinus floor and antrum, which may occur after extraction due to an infected root, due to carious process in the second premolar or first molar teeth, or may be due to severe periodontitis and mobility of these teeth within the affected quadrant of the maxilla, or due to trauma and dentoalveolar injury. Usually, the congenital or pathological oroantral communication occurs without the patient's knowledge and the patient seeks treatment only when he gets symptoms of sinus infection. This condition may cause an oroantral fistula to form and the patient may feel a salty taste in the mouth. Blowing of the nose may cause the development of sinus or may aggravate the sinusitis on the same side. This condition is clearly explained by the history given by the patient and by symptoms of constant runny nose (rhinorrhea) and positive findings in the affected sinus in the case of X-ray or transillumination. (Bhalla et al.2021)

Keywords: Oroantral communication, Oroantral fistula, Treatment modalities, Surgical closure, Conservative management.

1. Introduction
Oroantral communication (OAC) and subsequent oroantral fistula (OAF) is an uncommon but significant condition that arises as a result of an epithelial lined antral perforation with the oral cavity. Anatomically, the boundaries of the communication may range from a superiorly positioned OAC when the maxillary sinus extends into the canine fossa and infratemporal region, to an OAF that occurs along the alveolar process. OACs are more common as the increased vascularity of the oral cavity relative to the maxillary sinus can often hinder self-healing of antral perforations. They often

arise post dental extractions, especially of maxillary molars and premolars, or as a result of maxillofacial trauma. OAFs will tend to present with a watery discharge from the affected side, particularly when blowing the nose. This usually presents considerable time after an incident affecting the sinus. A common occurrence today is secondary to oral dental procedures, occurring in around 0.5-6% extractions of the first and second maxillary molars. If it is managed improperly, acute symptoms may be ignored by the patient and potentially return with antral infection, foreign body formation in the antrum and development of a chronic oro-sinus fistula. This paper discusses the management of OACs and OAFs with a systematic review of the literature on treatment modality over the last 40 years. This considers the type of closure required, relative timing to the initiating event, materials used for closure, and adjunctive treatments to aid successful management. (Bhalla et al.2021)

2. Diagnosis of Oroantral Communication and Fistula

2. Diagnosis of OAC and Oroantral Fistula Early diagnosis of OAC and Oroantral Fistula is of utmost importance to prevent the case from being continual and chronic. Therefore, when there is suspicion of OAC and Oroantral Fistula, patients should be referred to a specialist at an early stage, preferably within 48 hours, to allow swift and timely diagnosis and treatment. If diagnosis is unclear, referral to an Ear Nose and Throat Specialist or a Radiologist for further investigation should be considered. Simple diagnosis can be made by a dye test. This can be achieved by placing some normal saline in the patient's mouth and adding some dye, then asking the patient to force the liquid into the maxillary sinus by holding their head over the back of a chair. Flow of the dye from the nose indicates an OAC or Oroantral Fistula. Usually, the patient will have noticed the dye and saline mix in their nose before the test is completed. A more preferable method of dye testing is achieved by using a nasal endoscope to observe the placement of the dye in real time. Further diagnosis can be made using plain film x-rays, although many clinicians prefer to use a CT scan to accurately gauge the size and position of the OAC or Oroantral Fistula. Most useful are images taken after the Valsalva maneuver, that is bearing down results in a raise in intra nasal and intra oral pressure. This will show the real-time movement of oral fluids into the sinus. Dynamic imaging using such techniques as video fluoroscopy and the use of a dental x-ray film placed in the nose at the site of the OAC can also be useful. Magnetic resonance imaging is unadvised as patients who have OAC or Oroantral Fistula may inhale the contrast medium during the examination. (Manuel, 2021)

3. Non-surgical Treatment Options

Oroantral communication that has no signs of infection or symptoms which has been present for more than 24 hours is considered acute. Early detection and treatment will have a better prognosis. These cases can be managed by compressing the socket together with a gauze pack to control bleeding, then placement of an appropriate clot promoting material (surgicel, gel foam) followed by a resorbable suture to prevent clot displacement. If sealing of the OAC is successful, secondary healing will occur. The gauze pack and suture should be removed after a week and the patient should be reviewed to ensure no recurrence of OAC. This method has a good prognosis for less than 9mm OAC, but may not be successful in larger communication or if there is tension of the surrounding soft tissue. In attempting to seal the OAC with soft tissue adhesive (cyanoacrylate), results are less predictable and success may lead to removal of the adhesive material which can result in early OAC recurrence. (Bhalla et al.2021)

Patients suffering from oroantral communication and fistula may not be good candidates for surgery due to poor health, mentally disabled individuals, or patients with an unrealistic expectation of dental treatment. Simple or small post tooth extraction communication which is less than 24 hours old may resolve on its own once the socket starts to heal, hence it can be monitored through time without any invasive treatment for several weeks. In addition, patients should blow their nose and sneeze with an open mouth to prevent further damage. (Bhalla et al.2021)

4. Surgical Treatment Options

Following the failure of an OAF to close by secondary intention technique or by prosthetic obturation, the most commonly adopted treatment is surgical closure. Attempt such surgical closure. Primary wound closure with saline irrigation and hydroxyapatite has shown to be successful in 85% of cases. A more alarming method, initially resembling primary dental extraction, involves elevation of a periosteal flap to access the margin of the defect. A combination of buccal sulcus incision and elevation of the mucosal flap is initiated to gain access to the rim of the defect. The bridge of tissue between the two openings is then undermined and sutured to achieve primary closure. Successful adaptations and outcomes of this technique have been reported. An unexposed defect may close by layers simply apposing the periosteum and the buccal flap utilizing underrunning sutures of dissolvable material. Where the defect is exposed, an absorbable packing material or silicone can be used to effect closure. The use of alloplastic materials such as Teflon or surgical stainless steel wire has been used to effect closure by means of foreign body tissue reaction forming a granulomatous plug which will then be replaced by fibrotic tissue. The increased success of endoscopic sinus surgery in treating chronic sinusitis has led to its use in treating some OACs and OAFs; however, there is little evidence that indicates it as a suitable alternative for traditional methods. (Nagmode et al.)

5. Postoperative Care and Complications

The most common complication following closure of an OAC is recurrence of the OAC or development of an OAF. Recurrence of an OAC occurs in approximately 10% of cases. If this occurs, a further buccal flap or other surgical method can be used. OAF formation tends to occur when the OAC has closed primarily. The site of the OAF is generally more posterior than the original OAC and is due to unnoticed damage to the sinus lining. An oroantral or oronasal fistula may also form as a complication of other surgical methods, especially if mucoperiosteal flaps have been raised. Successful closure of these fistulae is often more difficult than primary OAC closure and usually requires referral to an oral surgeon with special interest in OMF. (Fox et al.2020)

Postoperative care following closure of an OAC is imperative in preventing further complications and recurrence. The patient should be instructed not to blow their nose or sneeze through the mouth as this creates positive pressure in the antrum. Any nasal decongestants should be avoided. The patient should be kept on a soft diet and have nasal packing in place. The nasal packing absorbs secretions and also blocks the communication between the mouth and nose. It should be left in place for 1-2 weeks. Oral antibiotics and antifungal agents are also useful. Patients should be reviewed weekly until the OAF has closed and then monthly for the next 6 months. A further maxillary sinus x-ray should be taken at the end of this period to ensure complete healing has taken place. (Thomas2022)

6. Conclusion

Oroantral communication has significant implications on both dental health and patient wellness. All authors disapprove of the simple closure of OAC with or without a mucoperiosteal flap. The relapse rate with this method is very high. This method should be avoided. The most critical factor in repairing an OAC is to ensure a well vascularized flap is moved from the donor site to the receptor site. Advances in surgical technique have moved towards a more conservative approach that yields reliable results. The use of a buccal or palatal sliding flap is technically easier than other methods and has a high success rate. Most lesions are small and do not require extensive surgery. The Caldwell-Luc antrostomy is indicated for larger lesions in which antral patency needs to be confirmed. The defect is closed with a mucoperiosteal flap in layers. This repair may also be completed endoscopically with two-handed surgery or uncinectomy/microdebrider techniques using a Silastic plug to seal the communication. RP has also been successfully repaired endoscopically using septal or septal olfactory grafts to repair the defect. Autogenous bone grafts have also been used with high success rates. (Pohl et al.2020)

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