

Methods of closure of oroantral fistula- A review

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Abstract:

An oroantral fistula is an abnormal pathological communication between maxillary sinus and oral cavity, which arise as a result of infections in the tooth, radiation therapy, osteomyelitis and iatrogenic exposure. It is mainly present in the region of maxillary bicuspids and molars. Oroantral communication is a common one faced by oral surgeons. This poses a risk between sinus and oral cavity, causing regurgitation of sinus contents into oral cavity. This article describes about the different methods and materials used for closure of oroantral fistula.

Key words: Oroantral fistula [OAF], buccal advancement flap, bio-oss Bio-gide sandwich

Introduction:-

An Oroantral fistula [OAF] is defined as the abnormal, epithelialized, pathological communication between oral cavity and maxillary sinus. A canal lined by epithelium, filled with granulation tissue and polyposis of sinus membrane is called as fistula. It is common between third and sixth decades of life, with strong male predilection. The presence of oroantral fistula can be detected by Valsalva test, cotton wisp test, blunt probing test. This can be confirmed by taking computed tomography [CT] or a panoramic radiography. If acute condition is left untreated, this progresses to chronic oroantral fistula, characterized by generalized mucosal thickening. The healing time of fistula is 2-3 weeks. If not healed beyond three weeks, then surgery is preferred, which involves removal of diseased bone and to resect the involved epithelium along the borders of fistula. The prime etiological factor responsible for oroantral fistula are exodontia (48%), especially first and second maxillary molars, whereas, the other factors responsible are tumors, osteomyelitis, Caldwell-Luc procedure, trauma, cyst and septal perforation accounting for 18%, 11%, 8%, 7.5%, 3.7% and 3% respectively. If oroantral communication is left untreated, signs and symptoms like purulent discharge from fistulous tract, regurgitation of oral fluids through nose, hyper-resonance of voice are noted.

Now, we will discuss in detail, the methods used for closure of oroantral fistula.

Discussion:-

Methods of closure:-

The oroantral fistula can be closed by autogenous or allogeneous materials.

The autogenous flaps are buccal fat pad, buccal flap and palatal flap.

Autogenous:-

The buccal advancement flap was first described by Rehrmann in the year 1936. Rotation of gingivovestibular flap for closure of oroantral fistula by Krompotie and Bagatin^[1], which is a modification of vestibular flap, which aims in preventing from lowering of vestibular sulcus due to its simplicity, reliability and versatility. A broad based trapezoid mucoperiosteal flap was created with two vertical releasing incisions of adequate dimensions to be sutured over the defect, with the advantage of better blood supply over the flap. Closure of oroantral fistulas with the help of buccal sliding flap was discovered by Moczair, thereby producing negligible change in buccal vestibular depth, its drawback being requirement of large dentogingival detachment, resulting in recession of gingiva and periodontal disease.

Closure of oroantral fistula using palatal flap as a full thickness flap was described by Von Ashley. Advantages being greater vascularity, thickness and quality of tissue. Disadvantage being flap necrosis, exposed bony surface, pain. The palatal flap can be classified based on thickness namely, mucoperiosteal, by direction of movement as straight advancement flap, rotation advancement flap, hinged flap, anteriorly based flap, submucosal connective tissue flap, submucosal island flap. Palatal mucoperiosteal rotation flap is used for late repair of oroantral fistula. A full-thickness palatal flap is typically performed lateral to vascular supply and 3mm apical to marginal gingiva of teeth. The advantages being thickness, excellent vascularity and easy accessibility. The use palatal straight advancement flap is limited due to inelastic nature of palatal tissue, reducing the lateral mobility, used in minor palatal defects. The palatal hinged flap is used to close small fistula of hard palate. The advantage being only a small raw area left behind for granulation to take place following closure of OAF. Palatal pedicled island flap is a single stage local flap, which provides advantages like greater vascularity, adequate bulk and mobility. This is preferred by many surgeons due to its versatility, simplicity and mobility. Buccal advancement flap is employed for the closure of oroantral fistula, which is trapezoidal in shape, sutured over the defect. Owing to its broad base, ensures good vascularity of flap with 93% success rate under local anesthesia. Free mucosal grafts or connective tissue grafts are suitable for the closure of small to moderate defects in the bicuspid area as well as small to medium sized persistent defects. According to Struder, palatal flap is the favorable donor site in the premolar area. Free mucosal grafts are used for closing the OAF in the maxillary second bicuspid region. The pedunculated sub-epithelial connective tissue graft is well suited for covering defects over molar region. The tongue is said to be the excellent site for soft tissue defects of oral cavity due to pliability, position and abundant vascularity. The flaps of tongue can be created by lateral, ventral and dorsal part of tongue, dictated by the location of defect. Complications include hematoma formation, which compresses the pedicle leading to necrosis of flap. The disadvantages of tongue flap are the requirements of general anaesthesia and multiple operations. The autogenous bone grafts have been used to close the defect measuring more than 10mm or in case of failure of closing the defect using conservative methods. Autografts have been harvested from sites like iliac crest, retromolar area, chin, extraction socket for repairing bony defects present in maxilla. Iliac crest is recommended for closure of large defects due to factors like prolonged postoperative pain and possible sensory disturbance. More recently, auricular cartilage has also been used for the closure of OAF. A full thickness flap is raised at the defect site. A semicircular incision is made posteriorly over conchal cartilage. The conchal cartilage with perichondrium is exposed with a blunt dissection. It is then adapted over the defect and sutured with surrounding tissue. The technique is biocompatible and easy to harvest. Disadvantage being a formation of potent defect at donor site.

Allogeneous:-

Multiple techniques have been described for the closure OAF using allografts like lyophilized fibrin glue of human origin. In this method, fibrin glue is prepared and injected into the socket, together with collagen sheet. Advantage being, no need to raise flaps, keeping the anatomy intact. Kinner and Frenkel have reported use of lyophilized dura for the closure of OAF, by placing in saline solution to regain pliability and the dura is exfoliated after 2 weeks. Disadvantage being transmission of pathogens.

Xenografts:-

Lyophilized porcine dermis has also been employed for the closure of OAF. The area was covered with buccal and palatal flaps. According to Mitchell and Lamb, closure of the defect using buccal and palatal flaps are not necessary. Advantage being, incorporation of granulation tissue and no need to remove prior to complete healing. Bio-Gide and Bio-Oss were used to close the oroantral defect, wherein the Bio-Oss was sandwiched between two sheets of Bio-Gide membrane for hard tissue closure the oroantral defect. Bio-Oss is a safe and effective bone graft material. It is similar to human bone under electron microscope, which is successful in forming new bone. Advantage being safe to use and no allergic reactions were detected.

Conclusion:-

Oro antral fistula being a serious entity, should be treated with greater caution and needs experience. Closure with autogenous grafts and xenografts have produced good results. Success of closure of fistula depends upon the selection of graft material.

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