

Exposed Dental Implant? Local Autograft A Saviour!

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Abstract:

Implant exposure due to faulty placement, poses as the most common reason for implant failure. The implant placed too close to buccal or lingual cortex have lead to such failure on numerous occasions. Also, anatomic variations like the thin buccolingual width of alveolar ridge predispose exposure of the implant. 25-year-old female patient had undergone surgical placement of implants in mandibular anterior region 2 months back in the private dental clinic. The clinician noted Grade I mobility in one of the implants placed. The case was referred to the author. Thin overlying gingiva depicted an entire buccal aspect of the implant, which suggested more than 90 % loss of buccal cortex. According to literature and review of similar case reports, the only way suggested was to surgically remove the implant and wait for 12-24 months for the bone to heal for subsequent placement. Rather than the removal of implants as suggested, the author followed a naval approach of reinforcing buccal cortex using an autogenous cortical block from mandibular symphysis. The reinforcement surgery had certainly saved patients time, money and most importantly limits a crucial period of edentulism, which may be enforced on a patient in case the implant was removed.

Key Words: Autogenous bone graft, osseointegration, platelet rich plasma

Introduction

Dental implant surgery is considered to be a safe surgical procedure. This aspect of clinical dentistry is having a much higher success rate. Complications of any surgical procedure should be taken into account prior to surgery. Dental implant surgery also had a list of considerable complications. These

complications range from failure to achieve proper placement to complete implant failure. Careful treatment planning based on accurate preoperative anatomic examination along with thorough knowledge of all aspects of oral implantology is the key to eliminating risk of complications.

Case Report

A 25-year-old female referred to the author by the private clinician. The patient had undergone surgical placement of 2 implants in mandibular anterior region 2 months back. No postoperative pain or swelling was mentioned in case sheet. No history of any trauma in immediate postoperative phase was noticed. Patient general status was healthy, and she was not suffering from any bone disorders. The clinician mentioned about mobility with a dental implant placed in the mandibular right central incisor region. Intraoral examination revealed no soft tissue dehiscence noted in the concerned area. Periodontal health of adjacent teeth was normal. Mucoperiosteum covering the dental implant in 41 regions was so thinned that implant outline can be easily appreciable in transmitted light (Figure 1). The implant was Grade I mobile. The marginal bone loss was seen in the adjacent implant.

The case discussed with the patient and depicted management options of implant removal or bone reinforcement to support the implant. The mandibular grafting technique was explained to patient and complications explained. The patient was ready for the surgery under local anesthesia.

Bilateral mental nerve blocks were given. Local anaesthesia with adrenaline administered in the mandibular vestibule. Crestal incision with two vertical releasing incisions placed. Full thickness mucoperiosteal Trapezoidal flap raised. Care was taken to raise mucosa in contact with the implant. Flap raised until the lower border of the mandible.

After hemostasis, the examination revealed completely denuded buccal aspect of the implant in relation to 41 (Figure 2). The defect measured to be about 18 mm mesiodistally. The thickness of the graft needed was assessed to be 2-3 mm, in order to compensate for the buccolingual loss of bone.

Using these measurements, the graft was marked 5-6 mm away from the apical margin of the implants. The safe distance of 5 mm from mental neurovascular bundle and inferior border of the mandible was maintained. The graft was marked using postage stamp method (Figure 3). The graft was procured

using chisel and a mallet and stored in sterile water. Some amount of cancellous graft was procured from the same site.

Ten milliliters blood was drawn from patient and sent for the preparation of platelet rich plasma. The graft was contoured from lingual aspect in order to fit according to implant contour. Margins of the graft were smoothened to prevent tearing of the flap. The graft was stabilised over the buccal aspect of implants using titanium screw away from implants (Figure 4). Cancellous bone was placed in between graft and implant. Platelet-rich plasma was placed over the graft. Gelfoam was packed at defect created at graft site. Periosteal scoring was done to achieve tension free closure. Hemostasis achieved and tension free closure was done using resorbable sutures.

Pressure dressing was placed over the chin to reduce edema. Antibiotics and analgesics were prescribed to the patient.

Wound healing found satisfactorily, and no any postoperative complications seen. Implant mobility was reduced to zero. Implants were loaded successfully after 6 months of surgery. No

prosthetic or esthetic problems observed. Most importantly, the patient was very happy and thankful after the prosthetic replacement!

Discussion

Implants have become a major mode of teeth replacement from past 30 years. Osseointegrated implants have high survival rates, but conditions like peri-implantitis or poor oral hygiene can lead to failure of the successful implant. The high survival rate of osseointegrated dental implants is well documented, but it is becoming increasingly clear that successfully integrated implants are susceptible to disease conditions that may lead to the loss of the implant.¹ Surgical complications during implant placement are not uncommon. According to a retrospective study by McDermott *et al.*, 677 patients (2379 implants) were investigated, and an overall frequency of complications was 13.9%. Operative complications made up a mere 1% of the overall, whereas inflammatory and prosthetic complications were 10.2% and 2.7%, respectively. Complications are expected and can lead to a number of poor treatment outcomes.² Most prevalent and disfiguring of these is implant failure.



Figure 1: Clinical examination depicts loss of buccal cortical bone showing implants under thin mucoperiosteum.



Figure 2: Mucoperiosteal flap raised to depict completely denuded buccal aspect of implant.



Figure 3: Graft marked using postage stamp method keeping same distance from implants.

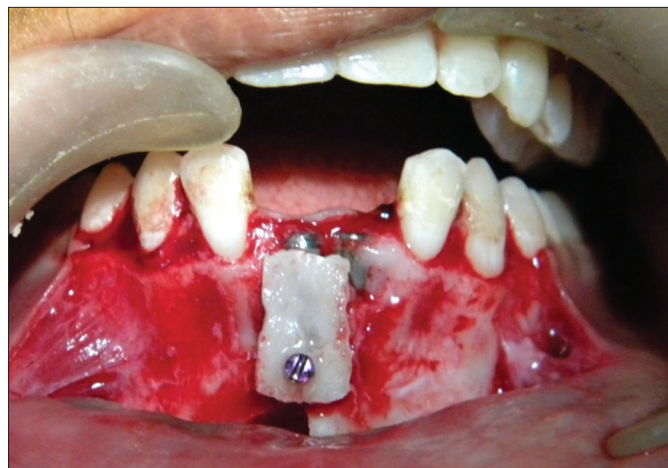


Figure 4: Symphysis block graft with cancellous bone chips placed and stabilised using single screw apical to implants.

Features and frequency

Peri-implantitis can manifest as saucer-shaped bone defect adjacent to the implant, vertical bone loss and pocket formation. Bleeding on probing, pus discharge can be the clinical signs for a diagnosis. Pain and swelling are usually associated to acute infection. The alveolar crest bone loss may also be seen on radiographic examination.

Management of such condition: What literature states

Various modalities have been used to cover the soft tissue loss around implant k/a dehiscence defect. These includes muscle flaps, barrier membranes.³ Non-resorbable barriers, mostly made of expanded polytetrafluoroethylene. The second surgery is almost inevitable for membrane removal. Bacterial colonisation is documented in cases with premature exposure of the membrane to saliva. This may be the reason for the loss of stability of the dental implant.

However, a second surgical procedure for their removal is needed. Their early spontaneous exposure to the oral environment is accompanied by bacterial colonization that demands premature retrieval, which causes less favorable results.⁵

What about hard tissue loss??

As a general rule, that was followed in most of the cases with implant exposure in last decade was to remove and replace the failed implant with longer or larger implants.³

This holds as a widely accepted treatment. This technique cannot be applied in cases where the complete buccal cortical plate is lost. Also in thin width alveolar ridge as in mandibular anterior knife edge ridge its impossible to place the wider implant. If implant removal is opted for in such cases, then the only options remain is to wait for the bony defect to heal and place implant subsequently. This will lead to the delay in treatment and also increase the period of edentulism.

Reinforcement of dental implants with bone loss using autografts with platelet rich plasma has been reported to yield positive results previously. They have used the cancellous bone chips obtained on a drill while drilling implant site, mixed with PRGF to cover the exposed part of the implant after placement. This cancellous bone achieved have provided a dense matrix to pack on exposed threads.⁴

Although the used technique have provided excellent option for hard tissue coverage for exposed implant during placement, the implant exposed after few months of placement with extensive bone loss as in the present case demands predominantly cortical graft to hold the implant.

Wilkes, Kernahan and Christenson (1985) showed that in onlay grafting the membranous bone survived twice as an endochondral bone. The membranous bone retains their bony

mass more than the endochondral bone which show the fibrous replacement. The intraoral donor sites provide close proximity of donor and the recipient site. Also, this precludes the need for skin incision and subsequent scar formation.

It was postulated that enriching the graft with growth factors would enhance the vascularization and hence increase the rate of the graft uptake. Some investigators were also able to demonstrate that growth factors stimulated new bone formation on their own. Hence, the use of growth factors for enhancing healing became increasingly popular. This concept was established in 1965, with heterotopic ossicle formation induced by the glycoprotein family of morphogens known as the bone morphogenetic proteins (BMPs). The highest concentrations of BMPs are measured in dense intramembranous transplants of the mandibular symphysis, ramus, and calvaria.⁵

Platelet-rich plasma enjoyed a great popularity after the publishing of an article by Marx and Garg in which had proven PRP as a concentration of platelets 4-7 times above baseline peripheral blood platelet levels.⁶

Various designs of bone traps were compared in literature in relation to bone particle size. Particle size of harvested bone is majorly associated with trap design. Saliva contamination always carries the risk of contamination irrespective to trap design. Bone particles harvested through low-speed drilling are not only less contaminated as they have very little contact with saliva, but also easy to harvest.⁷⁻⁹

Recipient site preparation for implant placement using drills carry a potential risk of thermal and mechanical damage to osteoblasts. This may have a destructive effect on peri-implantal alveolar bone.^{10,11} As a consequence, endogenous factors localized in a bone extracellular matrix having a key role in the success of processes such as bone regeneration and bone-implant integration may be damaged.

Thus, we conclude by denoting the use of symphysis bone graft with autologous platelet-rich plasma in dental implant surgery to combat the worst nightmare of any implantology: An exposed implant.

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