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Review Article

A Focus on Soft Tissue Changes Around Implant vs Natural Tooth

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Abstract

Replacement of missing tooth marks the dawn of dentistry. Digging into the ancient times, man is persistently been working on the replacement of natural body parts, missing due to any congenital defect, any disease or injury, so as to regain a proper form and function. In the general population, dental implants have recently become established as a standard treatment protocol for replacing missing teeth. This article aims at sharing the knowledge about the difference between natural tooth and dental implants in an attempt to focus on the dilemma of using dental implants as an assured replacement to the natural tooth.

Key words: Implant, Natural tooth, Periodontium

INTRODUCTION

In daily practice, dental professionals routinely face the challenge of making difficult decisions in making a treatment plan for patients with compromised dentitions, the choice is often one of either building on the existing teeth or extracting teeth followed by restoration with implant-supported reconstructions.[1] To patients and practitioners alike, tooth extraction befits the final attempt when all other possible options fail. However, most recently dental implants have drawn practitioner's attention toward providing tooth substitutes, often hailed as equal or even superior to natural teeth, and many clinicians have been looking forward to embrace the placement of dental implant as the new standard treatment in the field of dentistry.[2] Thus, this review focuses on highlights on how soft tissues vary around implant and natural teeth and points out the anatomical and histological differences of the tissues.

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GINGIVAL EPITHELIUM AROUND TEETH

The gingival epithelium [Figure 1] is composed of three types of epithelium, namely, junctional epithelium (JE), oral epithelium (OE), and oral sulcular epithelium (OSE). JE is a non-keratinized epithelium having weak cell-cell contacts, making it more permeable to the inflammatory exudates, thus easily gets affected by exogenous factors.[3,4] The JE possess certain defense properties; (1) chemotactic activity leading to the endocytosis and decomposition of exogenous factors by neutrophils and JE itself, (2) self-cleansing and antibacterial action of gingival crevicular fluid, (3) exfoliation of JE cell layer.[3] Histologically epithelium attachment to the enamel is a complex structure and is composed of internal basal lamina and hemi-desmosome. Adhesion of epithelium to the enamel or cementum takes place mechanically through hemi-desmosomes while connective tissue possesses vertical mechanical and chemical attachment to tooth. JE is formed during the tooth eruption by the fusion of reduced enamel epithelium with OE, this primary JE gets replaced with secondary JE, similar in structure and function to primary JE.[3] OE being the thick mucosal epithelium forms a seal around the tooth protecting the soft and hard tissues. This seal extends from OSE to the top of alveolar bone comprising of both epithelial and connective tissues. This attachment structure is termed as biological width, usually ~2 mm in width. JE is approximately 0.5–1 mm in width and is a stratified squamous epithelium extending that attaches to the

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cervical layer of enamel in younger generations and extends gradually to the cementum layer around with patient's age.[4-14]

GINGIVAL EPITHEIUM AROUND IMPLANT

The peri-implant junction [Figure 1] is composed of three types of epithelium, namely, peri-implant epithelium (PIE), peri-implant sulcular epithelium, and OE. The peri-implant mucosa sealing the tooth is comparable to the natural teeth having a biological width of 3–4 mm, slightly longer than that around natural tooth.[3] According to the studies, the peri-implant mucosa resembles is well-keratinized from outer surface and its inner lining resembles the JE of the natural tooth.[4] Berglundh *et al.* in an experiment showed that the JE around implant extends 2 mm apically from the soft-tissue margin, facing the implant as result of wound healing with epithelial cells proliferating along the exposed implant surface until the restoration of epithelial continuity and integrity. The apical cells terminate nearly at 1–1.5 mm coronal to the bone crest, separated by collagen rich, cell poor connective tissue without any inflammation.[4] The PIE is 3–4 cell layer thin, formed from the cells OE within 2–3 weeks after implantation and mature barrier of epithelium is achieved after 6–8 weeks of healing.[15-17]

CONNECTIVE TISSUE AROUND TOOTH

According to the study of Berglundh *et al.*, connective tissue around tooth is a complex structure having fan shaped arrangement of supra-alveolar fibers projecting from root cementum into the soft and hard tissues of the marginal periodontium running in lateral, coronal, and apical direction. Schoreder *et al.*[18] in his study described about the presence of dentogingival, dentoperiosteal, alveologingival, and periostogingival fibers attaching gingiva to teeth and bone, interpapillary fibers connecting the vestibular and oral interdental papillae, and circular or semicircular transgingival and transseptal fibers connecting adjacent teeth to one another.[4]

CONNECTIVE TISSUE AROUND IMPLANT

In contrast to the natural tooth, connective tissue around implant is different in cellular composition and fiber orientation having a poor mechanical resistance as compared to natural tooth [Figure 2].[4,6] The difference includes the orientation of collagen fibers in parallel direction around implant/abutment which also depends on the quality of mucosa where fibers tend to be perpendicular in keratinized mucosa and parallel in alveolar mucosa whereas in natural teeth fibers are arranged in perpendicular direction and tend to adopt a circular pattern,[4,6,16] whereas perpendicular direction of fibers is seen in certain studies in implants harboring porous surface [Figure 3].[6] Collagen fibers around implant extend between alveolar bone to mucosal margin. Studies have reported increased number of fibroblasts arranged in long axis parallel to the adjacent collagen fibers and to the implant surface, and this fibroblast rich barrier tissue plays an important role in maintaining an adequate seal against external environment. According to the study done on canine model by Berglundh *et al.* did a study on canine model and stated that peri-implant mucosa is formed after 4–6 weeks of healing and tissue maturation occurs between 6 and 12 weeks of healing. Tomas *et al.* in his study concluded that the peri-implant mucosal seal occurs completely within 8 weeks of healing and tends to be approximately 1.5 mm high lying supracrestaly.[4,16]

BIOLOGICAL WIDTH AROUND TOOTH

Biologic width is the term which describes the dimensional width of the dentogingival junction and was first described by Sicher in 1959 as "dentogingival junction". [15] Biological width is normally composed of connective tissue attachment (CTA) extending up to the apical extent of JE which includes 0.97 mm JE and 1.07 mm CTA [Figure 4]. [4,7] This natural seal may be defined as 'the total of supracrestal fibers, junctional epithelium and sulcus', which is essential for the maintenance of periodontal health and its violation leads to a damaged periodontium.[15]

Kois proposed three categories of biologic width which were based on the total dimension of attachment and the sulcus depth following bone sounding measurements which have been described Table 1.[15]

VIOLATION OF BIOLOGICAL WIDTH

It is the inadequacies of the tooth transition zone which is characterised by chronic progressive gingival inflammation around the restoration, bleeding on probing, localized gingival hyperplasia with minimal bone loss, gingival recession, pocket formation, clinical attachment loss and alveolar bone loss [Figure 8].[15]

Biological width assement can be done by using bone sounding method which includes probing under local anesthesia to the bone level and if this distance is less than 2 mm at one or more locations, a diagnosis of biologic width violation can be confirmed.[15]

BIOLOGICAL WIDTH AROUND IMPLANT

The implant-epithelium junction is similar to that of natural dentition. The difference includes the implant- epithelium junction is shorter and thinner than the tooth epithelium

junction and due to the absence of a cementum layer around an implant, most connective-tissue fibers in supracrestal region are oriented in a direction parallel to the implant surface.[15]

According to the study of Berglundh *et al.*, biological width in peri-implant mucosa includes 2 mm of epithelial attachment and 1–1.15 mm of connective tissue attachment separating the epithelium from bone crest. According to the studies, similar mucosal barrier can be seen in submerged and non-submerged implants, making no difference in dimension and composition [Figure 5].[5] Difference between the biological width of implant vs natural tooth has been given in Table 2.

Considering the different characteristics; roughness, sandblasting, and polished, no difference was seen in healing pattern of peri-implant mucosa for three systems which was seen.[4,7] However, less bone loss was seen in roughened surface and has no impact on final location of most bone-implant contact.[4,7] Various studies concluded that titanium was the only material that showed consistent soft-tissue biocompatibility, zirconium and aluminum oxide demonstrated coronal favorable histological outcomes, whereas dental porcelain and gold were less biocompatible.[4,7] Types of implants include one piece and two piece implant including a horizontal mismatch (abutment is smaller in diameter as compared to implant diameter) and a horizontal match (implant and abutment having same diameter). Various studies prefer using horizontal mismatch pattern, as it leads to less marginal bone resorption as compared to the horizontal match pattern of implant abutment junction which leads to saucer-shaped bone defect[8]

BIOTYPE AROUND TOOTH

Gingival biotype signifies the thickness of gingiva which is basically of two types including thick biotype which means gingival thickness of >2 mm and thin biotype when gingival thickness is <1.5 mm. The term periodontal biotype introduced by Seibert and Lindhe categorizing the gingiva into "thick flat" and "thin scalloped" biotypes.[9] Thick biotype is characterized by broad zone of keratinized tissue and a thick flat bony architecture and is more prone to pocket formation due to inflammation of periodontium and showing more of the fibrotic changes, whereas thin biotype is characterized by thin band of keratinized tissue and a thin bony architecture and is more prone to gingival recession.[9,10] However considering the gingival thickness in various periodontal procedures which includes the following.[9,10]

- Root coverage procedures – thick biotype have shown to give more predictable results
- Extraction – thick biotype shows minimal ridge atrophy whereas thin biotype is likely to result in fracture of the labial plate and traumatic ridge resorption in the apical and lingual direction.
- Crown lengthening procedures – post-operative tissue rebound has been seen in thick biotype as compared to thin biotype.
- Orthodontic therapy – thin biotype shows more chances of recession with fenestration and dehiscence formation with tooth movement.
- Prosthesis esthetics – thin biotype is more prone to recession thus more caution should be exercised while planning subgingival margin.

BIOTYPE AROUND IMPLANT

According to variety of studies done, the mucosal biotype is mainly classified as thick biotype with high scalloping mucosa and a thick biotype with low scalloping mucosa [Figure 6]. Significance of biotype in implant selection suggests that – immediate implant – thick biotype is more preferable as thin biotype is mostly associated with more of the recession with increased risk of unfavorable outcomes.[8] Table 3 describe various studies related to the biotype with peri-implant mucosa.[14]

Delayed implant – more preferable for thin biotype gingiva.[8,9]

Flapless implant – includes thin biotype patients as according to studies, flapless implant has shown to decreases the papillary recession and bone loss.[8,9]

PAPILLA HEIGHT IN NATURAL TOOTH

Topographically gingiva is divided into three categories free, attached, and interdental gingiva which varies depending on the adaption of gingiva around tooth (Schroeder and Listgarten, 1997).[18] Interdental gingiva occupies the space interdentally, coronal to the alveolar crest. In the incisor region, papilla is pyramidal shape with the tip located immediately beneath the contact point, which is narrower, referred to as dental papilla. In the posterior region, it is broader, having a concave col or bridge shape (Cohen, 1959).[19] The interdental gingiva gains the attachment to the tooth by connective tissue and JE (Gargiulo *et al.*, 1961),[20] lined in a coronal position by sulcular epithelium (Scrhoeder and Listgarden, 1997).[11] Table 4 describes the characteristics of different biotype.[14]

PAPILLA HEIGHT IN IMPLANT

The height of interdental papilla next to implant is one of the main parameters required for positive esthetic outcomes. Clinically, the presence of papilla between two teeth depends on the vertical distance between the alveolar and contact point of the adjacent teeth [Figure 7]. According to a clinical study:

- Vertical distance <5 mm – papilla present in 98% implant sites
- Vertical distance 6 mm – papilla present in 56% implant sites
- Vertical distance 7 mm – papilla present in 27% implant sites.

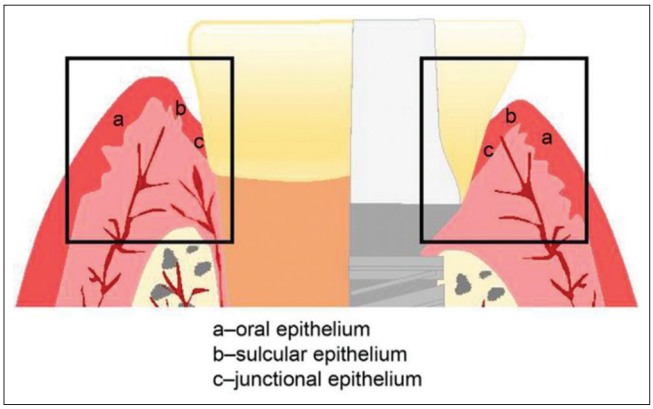


Figure 1: Epithelial components of dentogingival junction and peri-implant mucosa[5]

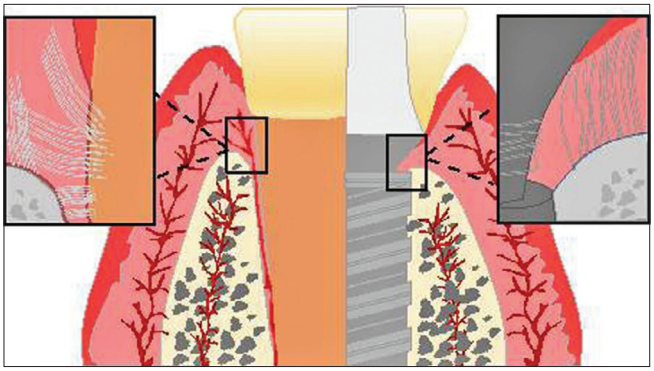


Figure 2: Connective tissue components of dentogingival junction and peri-implant mucosa. Perpendicular connective tissue attachment on tooth surface compared to longitudinal and circumferential fibers around the implant abutment surface.[5]

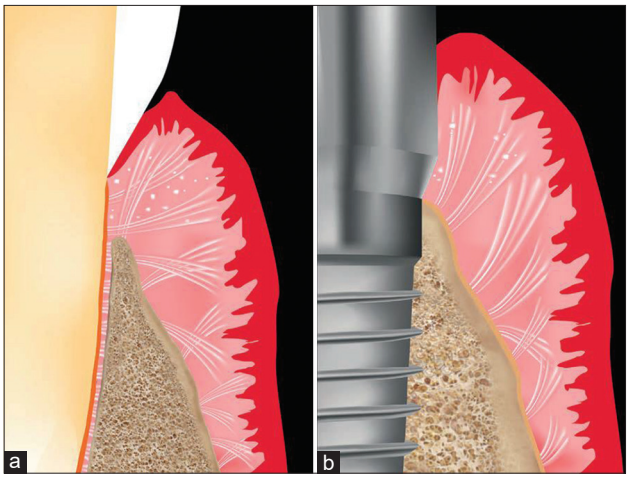


Figure 3: Illustrations of supracrestal tissues around a (a) natural tooth (b) titanium implant[16]

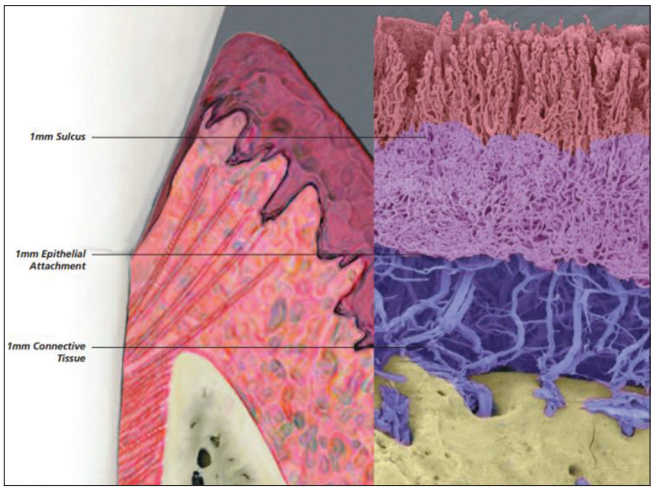


Figure 4: Biological width around natural tooth[12]

Figure 5: Illustration depicting the inherent thinning of the ridge following the development of the biologic width around standard two-stage implants. Note the increase in cortical bone and the reduction in cancellous bone[12]

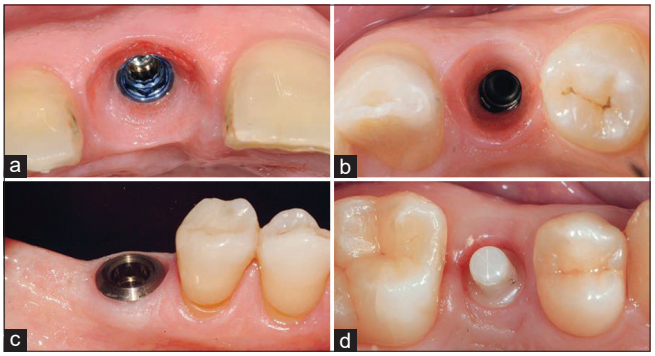


Figure 6: Physiologic appearance of peri-implant soft tissues around different implant types. (a and b) Bone level titanium implants. In these cases, the depth of the peri-implant mucosal tunnel, that is, the distance from the gingival margin to the implant connection, is greater. (c) Tissue level titanium implant. In these cases, the peri-implant mucosal tunnel is more shallow. (d) Single-component zirconia implant. With tissue level implants, the implant prosthetic platform is located closer to the surface in a juxtagingival or slightly subgingival position[16]

Table 1: Catergories of biological width

Crest	Mid facial measurement	Proximal measurement	Margins
Normal Crest (85%)	3.0 mm	3.0 mm to 4.5 mm	Margin of a crown should generally be placed no closer than 2.5 mm from alveolar bone.
High Crest (2%)	< 3.0 mm	< 3.0 mm	It is commonly not possible to place an intracrevicular margin because the margin will be too close to the alveolar bone.
Low Crest (13%)	>3.0 mm	>4.5 mm	These patients have been described as more susceptible to recession secondary to the placement of an intracrevicular crown margin.

Table 2: Summary of biological width around tooth versus dental implant[5]

Epithelial	Peri-implant epithelium Hemidesmosome attachment to Ti[21]	JE hemidesmosome attachment to enamel/cementum surface (Gargiulo *et al*., 1961)
Connective tissue attachment	Scar-like structure with abundant collagen but minimal vascularization, fibers run longitudinal, parallel, or circumferential fibers around the implant (Berglundh *et al*., 1994)	Well-organized perpendicular collagen fiber attach to root cementum[22]
Biological width	PIE=1.88 mm, CT=1.05 mm (Cochran *et al*., 1997)	JE=1.14 mm, CT=0.77 mm[23]

PIE: Peri-implant epithelium, JE: Junctional epithelium, CT: Connective tissue

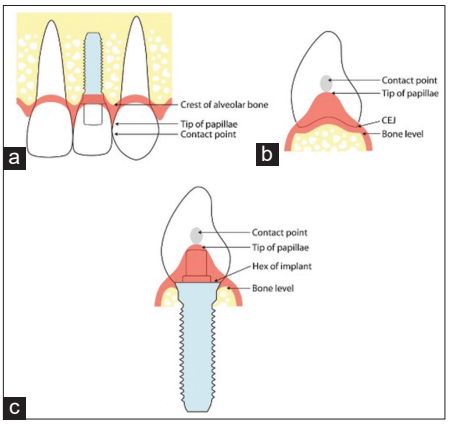


Figure 7: (a) Inter-dental/Inter-implant papillae; (b) inter-proximal view of inter-dental papilla in natural tooth; (c) inter-proximal view of inter-dental papilla in implant[12]

Compared to the natural teeth, the papilla height at implant site was reported to be shorter significantly and the mean papilla height between two implant was 3.4 mm, 1.5 mm less than a natural teeth, and an implant reported by an another study. However, a clinical study showed that for the presence of normal interdental paipilla, 3mm of interimplant distance is needed, as more crestal bone loss (1.04mm), was seen for interimplant distance <3mm and crestal bone loss was less (0.45mm) for imterimplant distant > 3mm.[8]

VASCULAR STRUCTURE OF GINGIVA AROUND TOOTH

Human gingival tissue is highly vascularized in nature.[4] In a clinical study, histological sections of the buccal periodontium in dogs showed that the oral surface of gingival tissue harbored a well-keratinized OE which was continuous with a JE that terminated at the cementoenamel junction. The connective tissue lateral to the JE was rich in collagen fibers and was devoid of accumulations of inflammatory cells.[13] The main source of gingival blood supply is large supraperiosteal blood vessels and vascular plexus of periodontal ligament (PDL) [Figure 7]. The vascular plexus of JE is rich in anastomoses anatomically extends from the coronal to the apical terminal ends of the JE, both vestibularly and orally including interdentally.[4] According to the study, the subepithelial oral plexus seems

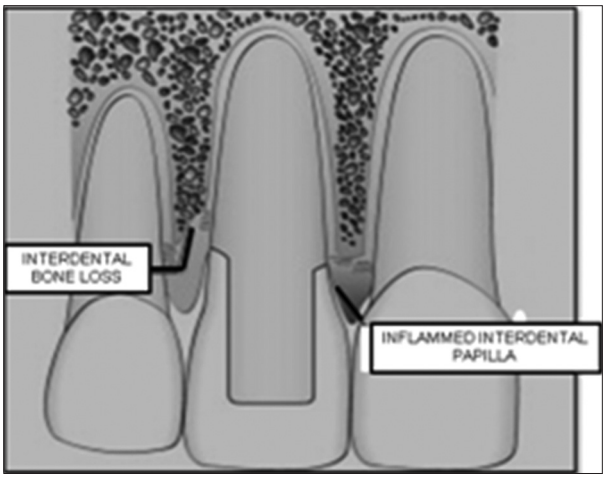


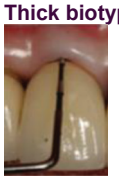
Figure 8: Ramification of biological width

to be as the terminal branches of the supraperiosteal plexus. The density of the vascular plexus was more in more in marginal gingiva and tends to increase all over during inflammation signifying the increase in capillary loops.[4,13] During inflammation, capillary venules of gingival plexus develop into high endothelial venules which proliferate, playing an important role against the selective entry of lymphocytes.[12] The vascular plexus consists of thin capillary loops projecting into the connective tissue papillae under the OE.

Table 3: Studies that correlated tissue biotype with peri-implant mucosa and the underlying bone[14]

Study	Study Design	N	Site	Definition of Biotype	Time of Measurement	Implant System	Observation Period	No. of Stages	Types of Prosthesis
Abrahamsson *et al*[34]	Animal Prospective	5 Beagle dogs 30 Implants	Mandibular premolars	Undefined	Abutment	Brånemark vs Astra Tech vs Bonefit	6 mo	1 and 2	Abutment connection and extension caps
Berglundh and Lindhe[41]	Animal Prospective	5 Beagle dogs 30 Implants	Mandibular premolars	Thin: 2.4 mm Thick: 3.3 mm	Abutment	Brånemark	6 mo	2	Abutment connection
Kan *et al*[21]	Retrospective	45 Patients 45 Implants	Maxillary anteriors	Thin: probe seen through tissue Thick: probe not seen through tissue	After prosthesis	Unknown	1 yr	2	Single crowns
Cardaropoli *et al*[38]	Prospective	11 Patients 11 Implants	Maxillary anteriors	Ultrasonic	Abutment connection	Brånemark	1 yr	2	Single crowns
Linkevicius *et al*[48]	Prospective	26 Patients 64 Implants	Unknown	Thin: ≤2 mm Medium: 2.1–3 mm Thick: >3.1 mm	Implant placement	BioHorizons	1 yr	1	Single crowns and fixed partial denture
Linkevicius *et al*[49]	Prospective	19 Patients 46 Implants	Unknown	Thin: ≤2 mm Thick: >2.5 mm	Implant placement	BioHorizons	1 yr	1	Single crowns and fixed partial denture
Linkevicius *et al*[50]	Prospective	4 Patients 12 Implants	Unknown	Thin: ≤2 mm	Implant placement	3i BioHorizons	1 yr	1	Splinted crowns and fixed partial denture
Blanco *et al*[39]	Animal Prospective	5 Beagle dogs 20 Implants	Mandibular premolars	Undefined	Unknown	Straumann	3 mo	1	Abutment connection

Table 4: Characteristics of different biotype[14]

Characteristics	Thin biotype	Thick biotype
		
Soft-tissue thickness	<2 mm	>2 mm
Facial height of peri-implant mucosa (equivalent biological width around tooth)	<3 mm	>4 mm
Impingement of peri-implant mucosa	Angular defect	Horizontal bone loss
Immediate implant placement in non-ideal position	More recession More papilla loss	Less recession Less papilla loss
Platform switching to minimize bone loss	No benefit	Potential benefit
Restorative components	Zirconium preferred	Zirconium preferred Titanium possible

The majority of these loops had a diameter which was about 7–10 μm.[13]

The vascular units coming as terminal branches of the supraperiosteal vessels, included vascular units consisting of thin vessels with a diameter of <7 μm and wider vessels with a diameter of 10 μm. The various vascular units formed in a mesiodistal direction a fine-meshed network of anastomosing structures; a "crevicular plexus." The vessels of the supracrestal connective tissue, lateral to the root cementum, were found to originate mainly from the vasculature of the PDL with a minor contribution from the larger supraperiosteal vessels. The vascular units close to the cementum were generally thin, but a few wider vessels could also be seen.[13]

VASCULAR STRUCTURE OF GINGIVA AROUND IMPLANT

The blood supply of peri-implant mucosa originates solely from the terminal branches of larger vessels of supraperiosteum from the vestibular border of alveolar ridge.[4] The peri-implant mucosa consists of JE facing the titanium abutment and a connective tissue present supracrestaly. This connective tissue is rich in supraperiosteal vessels which are similar to gingiva in location and configuration of arrangement. These vessels are present as thin capillary loops, having a diameter of 7–10 μm.[13] Lateral to the JE "cervical plexus" is present, at a distance of 50 μm from the basal layer of JE, suggesting the source of leukocyte migration and accumulation being same in both the tissues.[4,13] According to the dog study done by Berglundh, the root cementum of peri-implant mucosa is mainly devoid of vascular supply. However, the bone surrounding the fixture portion is richly vascularized

having vessels of varied diameter reaching the implant material, thus maintains the contact between the bone and implant material.[13]

CONCLUSION

These days, more and more patients are opting for dental implants after losing their teeth. Dental implants have made the life of patients easier as compared to other prosthetic restorations, in the following ways such as

- It is easier to eat with implant placement
- Gives a better alignment as each tooth relies on its neighbors to maintain proper alignment
- The body responds well to titanium as it gets easily osseointegrated to the bone
- Furthermore, implants are more durable, as results of various studies show 98% success rate for implant.

Moreover, the integrity of the tissue-implant interfaces can affect the success of dental implant treatment and success.

The integrity of the peri-implant soft-tissue seal is crucial for maintaining peri-implant tissue health. Although the transmucosal component of the restored implant shares some common features with teeth, namely, the presence of a JE and a connective tissue component, there are some important differences. A key difference is the nature of the relationship between the connective tissue and the implant surface, whereby there is "adaptation" of collagen fibers in a parallel orientation in relation to the implant, but insertion of fiber attachment perpendicularly into cementum in the case of teeth. This, combined with reduced cellularity and vascularity in the peri-implant connective tissue, may make them more susceptible to disease initiation and progression.[4]

In terms of disease etiology, dental plaque is the primary factor in both peri-implantitis and periodontitis. However, the presence of a subgingival connection between the implant and the abutment/ restoration poses some specific challenges, and the maintenance of the integrity of this connection is important in maintaining peri-implant tissue health. It should be noted that implant design features, such as the nature of the connection between the implant and the abutment, as well as the abutment and implant surface characteristics, may influence the maintenance of the soft-tissue integrity around implants. Iatrogenic factors, such as incorrect seating of the abutment and/or the restoration, and subgingival cement retention, will lead to loss of soft-tissue integrity and hence to peri-implant disease.[17]

REFERENCES

1. Pjetursson BE, Heimisdottir K. Dental implants are they better than natural teeth? Eur Int J Oral Sci 2018;126:81-7.
2. Rita C, Munni SK. Natural tooth versus implant: A key to treatment planning. J Oral Implantol 2012;38:95-10.
3. Ikiru A, Yasunori A, Ryosuke K, Wakana O, Yuri M, Akihiro F, *et al*. Soft tissue sealing around dental implants based on histological interpretation. J Prosthodont Res 2016;60:3-11.
4. Saso I, Ryan L. Comparison of peri-implant and periodontal marginal soft tissues in health and disease. Periodontol 2000 2018;76:116-30.
5. Wen LC, Masfueh R, Keyvan M, Muhammad SZ. The hard and soft tissue interfaces with dental implants. In: Dental Implants. Sawston, United Kingdom: Woodhead Publishing; 1969. p. 173-201.
6. Sangeeta D, Lanka M, Gregori MK, Vandana KL. Peri-Implant and Periodontal Tissues: A Review of Differences and Similarities. AEGIS Commun 2013;34:1-20.
7. Zeinab RE, Mahdi K, Parisan G, Reza A, Euloir P, Homayoun HZ. Biologic width around dental implants: An updated review. J Dent Mater Tech 2016;5:68-81.
8. Daniel S. Thoma, SM, Ronald EJ. Critical soft-tissue dimensions with dental implants and treatment concepts Periodontol 2000 2014;66:106-18.
9. Sangeeta D. Significance and clinical relevance of biologic width to implant dentistry. J Interdiscip Dent 2012;2:84-91.
10. Seba A, Deepak KT, Ambili R, Preeja C, Archana V. Gingival biotype and its clinical significance a review. Saudi J Dent Res 2015;5:3-7.
11. Zetu L, Wang HL. Management of inter-dental/inter-implant papilla. J Clin Periodontol 2005;32:831-9.
12. Kazuto M. Histologic comparison of biologic width around teeth versus implants: The effect on bone preservation. Int Dent SA 2009;12:52-8.
13. Berglundh T, Lindhe J, Jonsson K, Ericsson I. The topography of the vascular systems in the periodontal and peri-implanl tissues in the dog. J Clin Periodontol 1994;21:189-93.
14. Angie L, Jia HF, Hom LW. Soft tissue biotype affects implant success. Implant Dent 2011;20:e39-46.
15. Amit P, Abhishek Z , Sheetal S, Shikha G, Shashi P. Biological Width: The Silent Zone. Int Dent J Stud Res 2015;2:11-15.
16. Daniele C, Paolo C. Soft Tissues and Pink Esthetics in Implant Therapy. Lombardy, Italy: Quintessenza Publishing; 2017.
17. Stephen DC, Lyndon C, Helen C, Paul HT, Brian N, Sue HP, *et al*. Removable partial dentures: The clinical need for innovation. J Prosthet Dent 2017;118:273-80.
18. Schroeder HE, Listgarten MA. The gingival tissues: The architecture of periodontal protection. Periodontol 2000 1997;13:91-120.
19. Cohen B. Morphological factors in the pathogenesis of the periodontal disease. Br Dent J 1959;7:31-9.
20. Gargiulo AW, Wentz FM, Orban B. Dimensions and relations of the dentogingival junction in humans. J Periodontol 1961;32:261-7.
21. Chai WL, Moharamzadeh K, Brook IM, Emanuelsson L, Palmquist A, van Noort R. Development of a novel model for the investigation of implant-soft tissue interface. J Periodontol 2010;81:1187-95.
22. Vacek JS, Gher ME, Assad DA, Richardson AC, Giambarresi LI. The dimensions of the human dentogingival junction. Int J Period Restorative Dent 1994;14:54-165.
23. Cochran, DL, Hermann, JS, Schenk RK, Higginbottom FL, Buser D. Biologic width around titanium implants. A histometric analysis of the implanto-gingival junction around unloaded and loaded nonsubmerged implants in the canine mandible. J Periodontol 1997;68:186-98.

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