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“Monday Morning Pearls of Practice by Bobby Baig”

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Teeth versus Implants: Mucogingival Considerations and Management of Soft Tissue Complications. **Part 1**

Introduction:

The mucogingival considerations and soft tissue complications that can occur around teeth and implants are somewhat similar.

Extractions and Soft Tissue Complications:

- A good number of soft tissue-related implant complications can be attributed to physiologic changes that occur following tooth extraction as opposed to the actual placement of an implant.
- Loss of bone and soft tissue can occur before tooth extraction due to periodontal disease, periapical pathoses, and trauma.
- Loss of bone and soft tissue can also occur during the tooth extraction process.

Extraction and Soft Tissue Healing Process:

- It is well documented that extraction sites undergo three basic phases of healing, beginning with the inflammatory phase, followed by the proliferation phase and culminating with the modeling/remodeling phase.
- In the modeling phase, there is reduction in the alveolar ridge dimension, both in height and width that can challenge soft tissue esthetics and long-term maintenance around dental implants.
- Most of these changes occur during the first year following tooth extraction, where the width of the residual ridge may decrease by more than 50 percent.
- Clinicians must therefore consider this issue when deciding to replace a natural tooth with an implant. Adjunctive procedures are often necessary to compensate for these alveolar bone changes and ideal restoration of the hard and soft tissue complex is often not attainable, which is critical in the esthetic zone.
- The decision to retain or to replace a tooth with a dental implant is often complex because the decision is multifactorial and evidence-based guidelines are limited and vague.

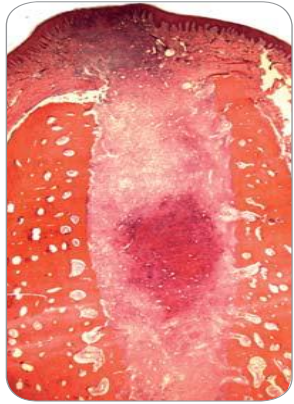


FIGURE 1A.

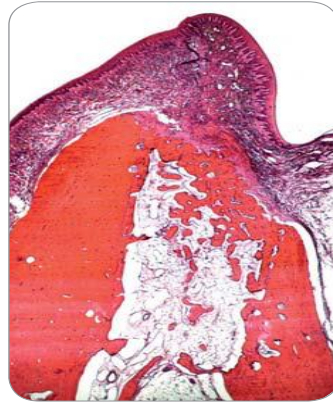


FIGURE 2.
Eight weeks.

FIG 1 and 2. Extraction defect histology after one and eight weeks demonstrating loss of bone height and width due to bone remodeling. (Photos courtesy of Maurício Araújo, DDS, MSc, PhD.)

- It must be recognized that implants are associated with both short- and long-term complications that often require additional surgical intervention to resolve.
- Treatment of these complications is poorly understood, especially in the case of peri-implant diseases. It is also unpredictable, as in the case of gingival recession repair and peri-implant bone repair.
- Peri-implant tissue loss and further alveolar ridge resorption can lead to metal exposure of the abutment or implant, unsightly interproximal spaces, food impaction, embarrassing escape of saliva and air, and compromised speech.

Teeth and Tissue Biotype:

The periodontal or gingival biotype has been recognized as an important factor in predicting outcomes following periodontal surgery.

Thick biotype: Is characterized by a dense gingival tissue, wide zone of attached gingiva, flat gingival topography suggesting a thicker alveolar architecture and short, blunted interproximal papilla surrounding a square tooth form. (Fig 3 to 5)



Fig 3



Fig 4



Fig 5

Thin biotype: Is defined by a delicate and friable gingival tissue that is almost translucent in appearance. It has a more pronounced scallop shape suggesting thin underlying alveolar bone often with underlying bone fenestration and dehiscence defects, a small zone of attached gingiva and long, pointy interproximal papilla surrounding a tapered tooth form. (Fig 5 and 7)



Fig 6



Fig 7



Fig 8

- The gingival biotype is influenced by the shape, size, and location of teeth as well as gender and age. Gingival biotype appears to be genetically determined.
- Recognition of the biotype allows the clinician to better predict soft tissue behavior and avoid unexpected outcomes associated with various disease conditions following surgical procedures.
- It is important to recognize that patients may present with a mixed thin and thick biotype with regional differences influenced by the shape, size, and location of the teeth.
- The biotype assessment is generally site specific. For example, the biotype could be considered thin over a prominent maxillary canine root and thick around the adjacent incisors.

Biotype and Periodontal Disease:

Thick biotype: Associated around teeth with periodontal disease tends to lead to periodontal pocketing in conjunction with intra-bony defect formation with minimal recession.

Thin biotype: Tends to exhibit less pocket formation and more recession.

The biotype can influence diagnosis of disease because progressive attachment loss can manifest as recession often with only slight-to-moderate periodontal pocketing. The biotype also has implications with periodontal therapy where it is believed that scaling and root planing is generally more effective around teeth with thin biotypes whereas thick biotypes more often require pocket elimination surgery.

Biotype and Tissue Rebound after Surgery and Orthodontics:

Thick biotype: Studies have shown a greater rebound of tissue growth following crown-lengthening, often dictating more aggressive tissue resection during surgery. A thick biotype has also shown to be beneficial with less tooth recession occurring during orthodontic tooth movement. (Fig 9 to 11)



Fig 9



Fig 10



Fig 11

Thin biotype: Is associated with less favorable outcomes following mucogingival surgery to achieve root coverage.

Implant and Tissue Biotype:

- It is well accepted that soft tissue esthetics around implants can be managed more predictably in thick biotype environments.
- A thin biotype is usually associated with thin buccal plates.
- Following tooth extraction, sites with thin biotypes, defined as thin gingival tissues and thin buccal plates, exhibit more buccal bone loss than sites with thick biotypes. This results in increased gingival recession that may diminish soft tissue esthetics around implants.
- A greater prevalence of papilla presence around single-tooth implants adjacent to natural dentition is often seen with thick biotypes and a decreased prevalence of papilla. Generally more recession is found with thinner biotypes. (Fig 12-15)

Implant planning and biotype: The biotype should always be taken into account when planning for implants, especially in the esthetic zone.



Fig 12



Fig 13



Fig 14



Fig 15

In a patient with a high smile line where a thin biotype is present in the esthetic zone, all attempts should be made to retain teeth as opposed to removing and replacing them with implants. When teeth cannot be retained in thin biotype situations, adjunctive procedures, such as the addition of an interpositional connective tissue graft, may be beneficial to modify the phenotypic expression of the biotype and decrease the risk of recession and papilla loss.

Continued in next issue.....

Reference:

1. Millennium research group — U.S. markets for dental implants 2013.
2. Amler MH. The time sequence of tissue regeneration in human extraction wounds. *Oral Surg Oral Med Oral Pathol* 1969;27(3):309-318.
3. Araujo MG, Lindhe J. Dimensional ridge alterations following tooth extractions. An experimental study in the dog. *J Clin Periodontol* 2005;32:212-218.
4. Tan WL, Wong TL, Wong MC, Lang NP. A systematic review of post-extraction alveolar hard and soft tissue dimensional changes in humans. *Clin Oral Implants Res* 2012;23 suppl 5:1- 21. doi: 10.1111/j.
5. Caplanis N, Lozada JL, Kan JY. Extraction defect assessment, classification and management. *J Calif Dent Assoc* 2005;33(11):853-863.
6. Zitzmann NU, Krastl G, Hecker H, Walter C, Weiger R. Endodontics or implants? A review of decisive criteria and guidelines for single tooth restorations and full arch reconstructions. *Int Endod J* 2009 Sep;42(9):757-74. doi: 10.1111 Epub2009 Jun 22.
7. Donos N, Laurell L, Mardas N. Hierarchical decisions on teeth versus implants in the periodontitis-susceptible patient: The modern dilemma. *Periodontol 2000* 2012; 59(1): 89-110.
8. Torabinejad M, Anderson P, Bader J, Brown LJ, Chen LH, Goodacre CJ, Kattadiyil MT, Kutsenko D, Lozada J, Patel R, Petersen F, Puterman I, White SN. Outcomes of root canal