Tissue Accommodation Matters: In Esthetic and Cosmetic Dentistry

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Summary

Cosmetic Dentistry is not durable, does not necessarily emulate pristine nature and always demands replacement. Dentistry will be considered cosmetic if it is temporary, not ideal and demands correction for healthy survival. Esthetic dentistry should be durable, have a natural appearance and survive all anticipated oral functions amongst the full range of healthy activity. Destruction, irritation or degeneration of soft or hard tissues from any dental procedure classifies the procedure as cosmetic. Cosmetic dentistry's main concern is for short term appearance modification, and is not ideal if CD induces unwanted, chronic destructive tissue-damage. Although cosmetic dentistry is temporary and is often selected for acceptable short term appearance modification, cosmetic dentistry should be reversible. This appraisal stresses the use of clinical crown preparation and the importance of selecting health-ensuring biologically determined moderators for durability in dental procedures. Impinging on the biological width for attachment is regarded as cosmetic dentistry, is spurious and not in the patient's best interests. Typical examples are presented.

Keywords: Cosmetic; Esthetic; Dentistry; Implant; Prosthodontics; Teeth; Osseo-integrated

Abbreviations

- CD = Cosmetic Dentistry
- ED = Esthetic Dentistry
- CCL = Clinical Crown Lengthening
- BW = Biological Width
- MFP = Metal Fused to Porcelain
- OIP = Osseo-integrated Implant

Provenance and background: All procedures done as dentistry may be classified as Elective and as Esthetic Dentistry (ED) or Cosmetic Dentistry (CD). Cosmetic dental decoration as Cosmetic Dentistry (CD) has existed for thousands of years. Fossil skulls from ancient civilization, like the Mayan, are known [1,2]. Some practiced tooth staining [3,4] decoration [4,6] or mutilation [5-8]. CD is used in modern dentistry with much circumspection and constraint. Cosmetic dentistry is not expected to be durable, is purposely temporary in nature, overlooks any local irritating physiological reaction (like major or minor bone resorption, or inflammation), does not emulate perfect natural form or function, and often is simply decorative [9]. Theatrical Dentistry is the peak of practice of Cosmetic Dentistry [10]. Esthetic Dentistry (ED) should not produce any short or long-term deleterious physiological reactions on soft tissues (gingival/mucosal/lingual) or hard tissue (bone and tooth enamel, dentin or cementum), must survive in health, and should replace oral and dental forms and functions, as close to ideal as possible [9]. Many dentists and other health care workers are indifferent to the fundamental differences between EC and CD, especially when it comes to rapid repair for appearance changes.

Aim

This appraisal reviews the criteria for classifying Cosmetic and Esthetic Dentistry, stresses the 'Biological Width' (BW) which embraces physiological principles inherent in clinical

crown preparation for optimal prosthetic dental therapy, and reiterates rationale for choosing esthetic dentistry.

Successfully placed prostheses should satisfy most of the stringent health sustaining physiological demands to be deemed esthetic dentistry. There are clear-cut differences between cosmetic and esthetic dentistry [9]. See Table 1 Well executed crowns for example demand minimal if any physiological accommodation or tolerance; there must be no tissue reaction other than realization of healthy tissue; they also last for most of the patients' life in health; they function optimally; the prostheses must emulate age-appropriate modifications; they should promote health; they are usually not frivolously decorative and will appear totally natural; the choice of materials is well accepted biologically and don't induce any immunity, inflammation or metabolic dysfunction [9].

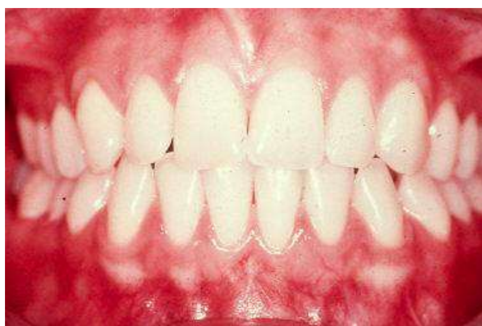

Figure 1: A natural healthy dentition; this is what ideal dentistry aspires to emulate.

Cosmetic Dentistry	Esthetic Dentistry
Reactive tissue accommodation or tolerance	No physical reaction and healthy physical accommodation
Consciously temporary	Long-term durable
Not ideally functional	Optimal good function
No natural emulation	Emulates natural state
No health enhancement	Promotes health
Superfluous decoration	No decoration
Compromised form	Form is ideal
Available technique and material.	Best technique and materials

Table 1: Differences between Cosmetic and Esthetic Dentistry. From:- TOUYZ LZG, Raviv E, Raviv, M Cosmetic and Esthetic Dentistry? Quintessence International 1999;30:227-3 [9].

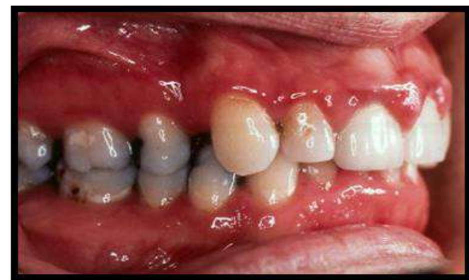

Figure 2A and Figure 2B: Cosmetic crowns. Theupper front central incisors (Tooth-18 and Tooth-19 ADA numerology) are restored with Fixed crowns. Notice the marginal gingival hyperplasia. This is deemed Cosmetic Dentistry and demands attention.

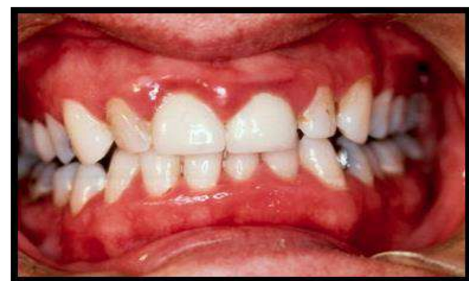

Figure 2A and Figure 2B: Cosmetic crowns. TheUpper front central incisors are restored with Fixed crowns. Tooth-18 and tooth-19 (ADA numeration) impinge on the biologically width (BW) sub-gingivally, and the adjacent surrounding gingivae are swollen, changed in color, and show inflammatory hyperplasia. Bleeding on probing (BOP) is positive [9].

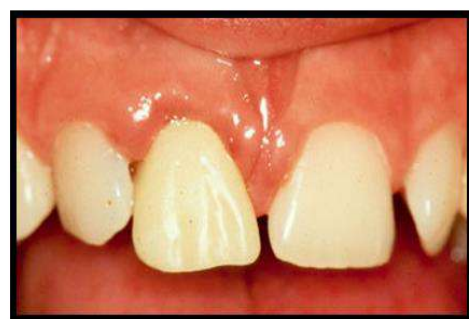

Figure 3A: A cosmetic crown placed on Tooth-18 (ADA numerology). The surrounding gingivae are inflamed, swollen and bleed easily on probing. This reactive tissue response derives from the subgingival crown margins impinging on the BW,the space needed for healthy stable dento-gingival attachment.

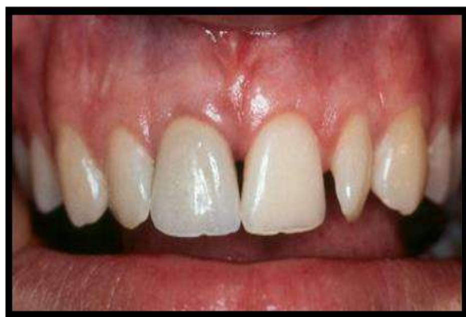

Figure 3B: An esthetic crown placed on same Tooth 18 as in 3-A above.The gingivae and underlying dentoalveolar bone were prepared with a 'Clinical Crown-lengthening' (CCL) periodontal surgical procedure. There is no inflammation of the gums, no BOP, and the result has resolved toa healthy stable,pericoronal, durable gingival architecture. Th new crown does not impinge on the BW. Healthy tissue is present.

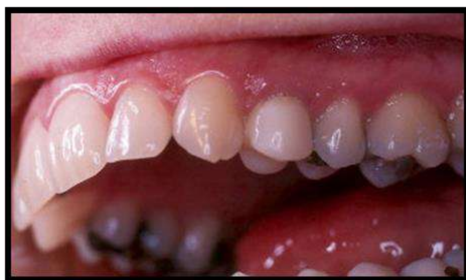

Figure 4A: A Cosmetic temporary Crown placed on tooth-12 (ADA numerology). Note marginal swelling and inflammation.

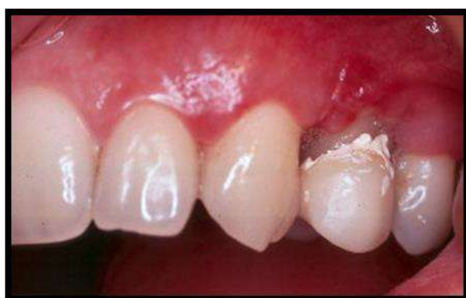

Figure 4B: Tooth-12 One week after a Clinical Crown Lengthening (CCL) periodontal surgical procedure. The sutures have been removed and the poor marginal-fit and temporary cement is visible. Enough biological width (BW measured as 3-4m between the bony alveolar margin and prepared coronal edge during the surgery) has been created on the tooth root,that allows for a healthy durable gingivo-dental attachment.

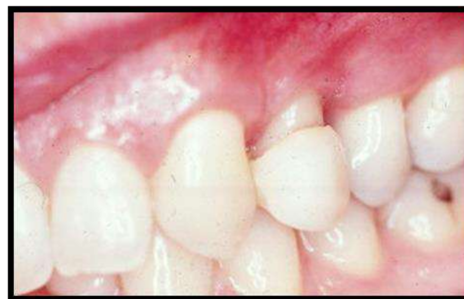

Figure 4C: Tooth 12 Six weeks after the CCL. The gingivae have healed and the excess temporary cement has washed away. There is healthy healing of the surrounding gingivae.

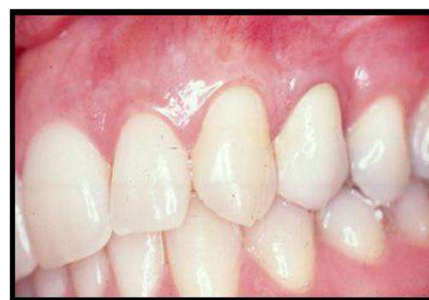

Figure 4D: Tooth 12 restored with esthetic crown. There is no peri-coronal inflammation, and healthy gingival architecture is re-established. There is no BOP.

Discussion

Clinical crown preparation as a therapeutic goal can be accomplished surgically, orthodontically, or by a combination of both. Clinical Crown Lengthening (CCL) is defined as 'those surgical procedures that aims at exposing sound tooth structure for restorative purposes through apical repositioning of the gingival tissue with or without removal of alveolar bone'. (AAP Glossary of Terms 2001). The Biological Width (BW is measured as 3 mm to 4 mm between the bony alveolar margin and prepared coronal edge during the surgery) on the root and allows for a healthy durable gingivo-dental attachment [11-18]. This allows for a healthy durable gingivo-dental attachment and placing the crown margins in the gingival-sulcus or at the gingival-margin.

The great challenge of Prosthodontics crown preparation is to ensure that there is enough 'Biological Width' available for healthy tissue adaptation around fixed coronal prostheses [12-15]. This happens if the dento-gingival fibers, as the coronal part of the intact periodontal ligament, establishes a fibrous link between the gingivae and crest of the alveolar

marginal bone. Consequently, scrutinizing radiographs, careful visual inspection of the gums, periodontal probing (using a probe with 20 Grams pressure) full occlusal analysis and soft-tissue assessment becomes part of recognizing, correcting and sustaining acceptable durability of a placed prosthesis [15-18]. There should be no Bleeding on Probing (BOP) of successfully placed prostheses [10-12]. Although some CD uses ED, such as placing a temporary crown for social appearances, if any dental therapy is not permanent or does not emulate pristine nature, it is regarded as cosmetic, even if the prostheses may be regarded as fixed and durable. Gold crowns and/or diamonds set in gold crowns is such an example [10,22].

Pre-operative presentation (Figure 5A). Esthetic post operative, full mouth rehabilitation using esthetic dental techniques. Note healthy recovery, adaptation and resolution of inflammation of gingiva (Figure 5B) [9,10].

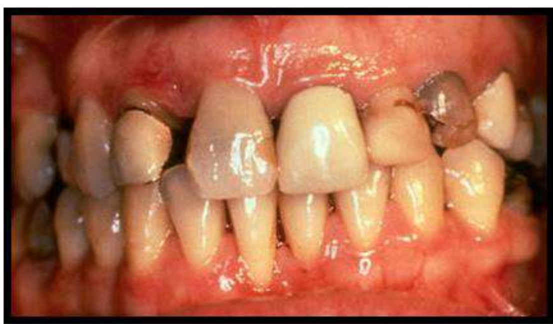

Figure 5A: Cosmetic Dentistry: pre-operative presetation.

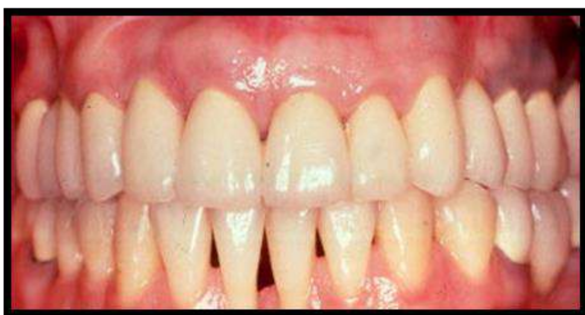

Figure 5B: Esthetic postoperative, full mouth rehabilitation using esthetic dental techniques. Note healthy recovery, adaptation and resolution of inflammation of gingival [9,10].

Successfully placed implants are regarded as esthetic [19,20]. Should an OIP induce inflammation or progressive bone resorption, it fails as ED, must regarded as CD. It becomes a temporary prosthesis and it will be destined for replacement to procure sound health, good stability, and long-term durability. In one sense, OIPs are a form of body piercing, but this Surgical (OIP) procedure is performed to procure optimal replacement of form and function for missing teeth, as opposed to body piercing for other, possible spurious, psycho-social reasons [10,19,20]. Successful OIP's must satisfy the stated properties in Table 1 to be deemed esthetic dentistry.

Concluding Remarks

Placing of any restoration on a tooth must not impinge on the BW. Fixed dental prostheses are generally preferred to removable devices. Optimal form and function are primary aims in dentistry. The appearance impact should be deemed to be visually harmonious. Successful permanent prostheses can be moderated for appearance with esthetic principles to promote health, durability and survival. OIP may be regarded as 'Body piercing" but should not be confused with Tattooing or body piercing for cosmetic reasons [21]. Permanent gold restorations are also deemed cosmetic because their color is not natural [21,22]. The acme of Cosmetic dentistry would be deemed 'Theatrical Dentistry [10].

Conclusion

All successful prostheses well placed, functioning in health, with hard and soft tissue stability, in the long-term ensures survival. The biological width must be available for peri-coronal dento-gingival attachment to function in health. Pristine emulation of nature in dentistry, without any deleterious effect on hard and/or soft tissues, is deemed desirable esthetic dentistry.

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