

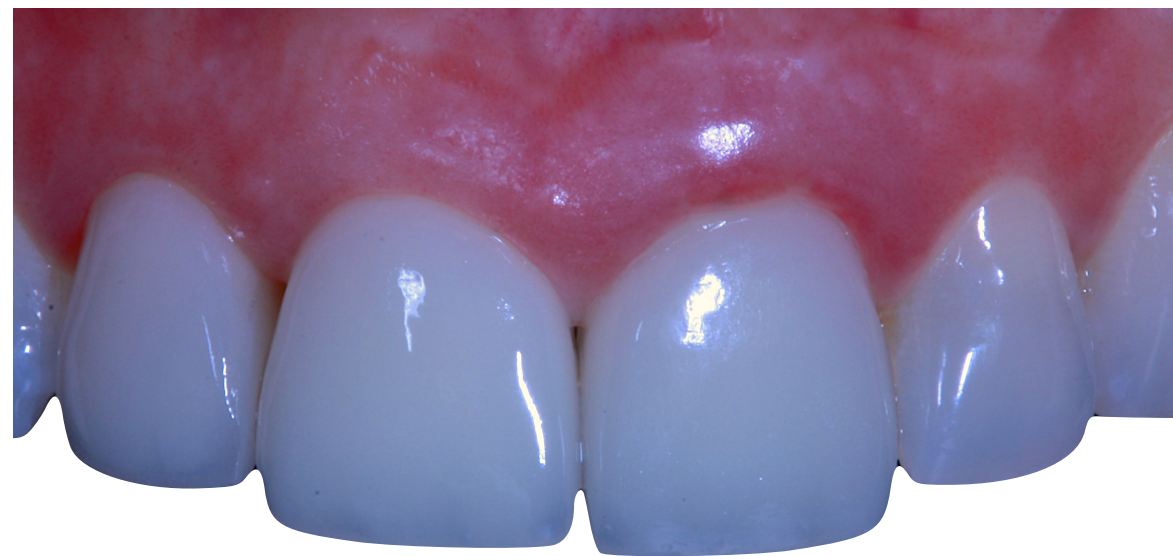
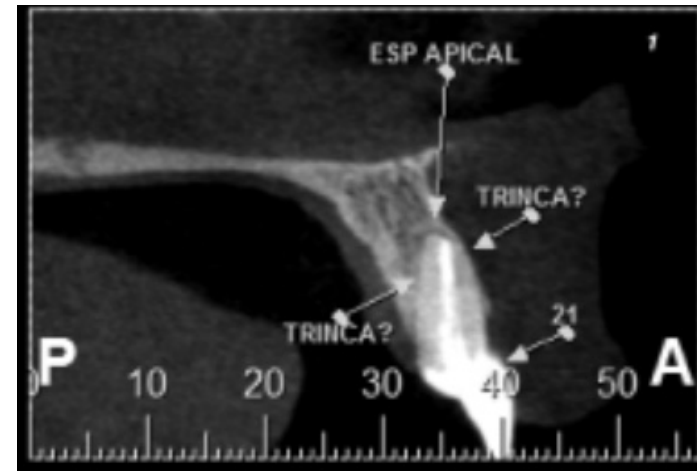
Is the facial bone wall critical to achieving esthetic outcomes in immediate implant placement with immediate restoration?

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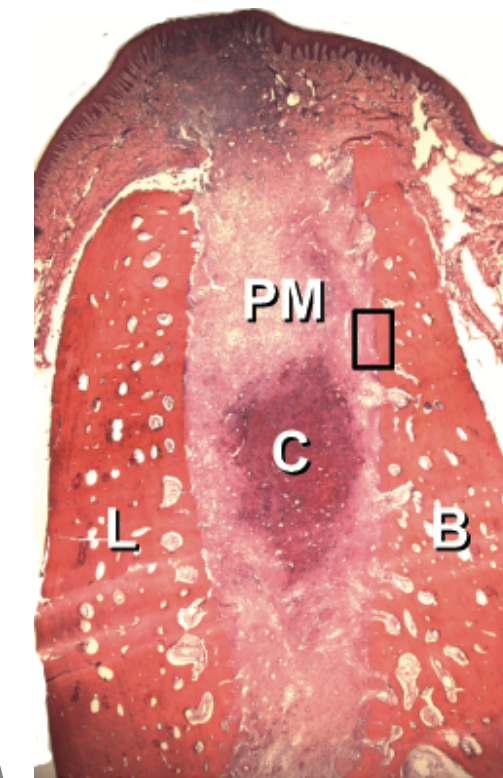
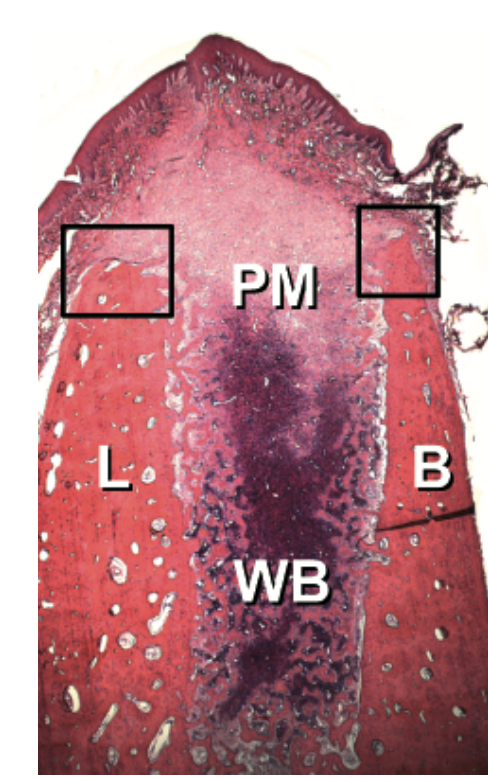
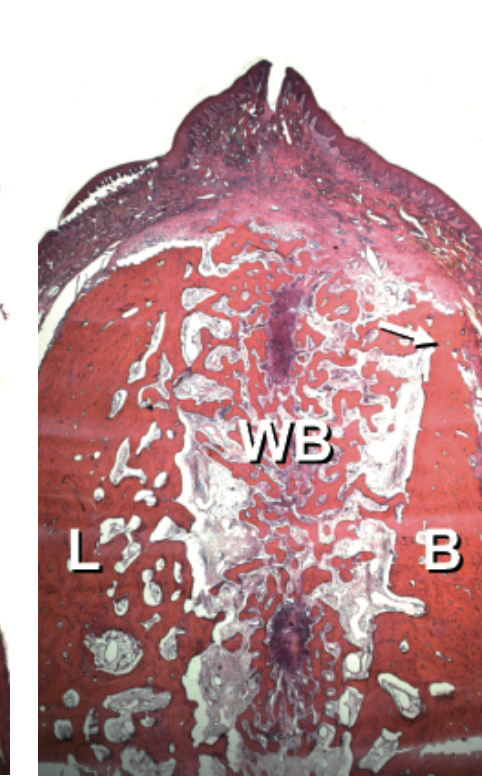
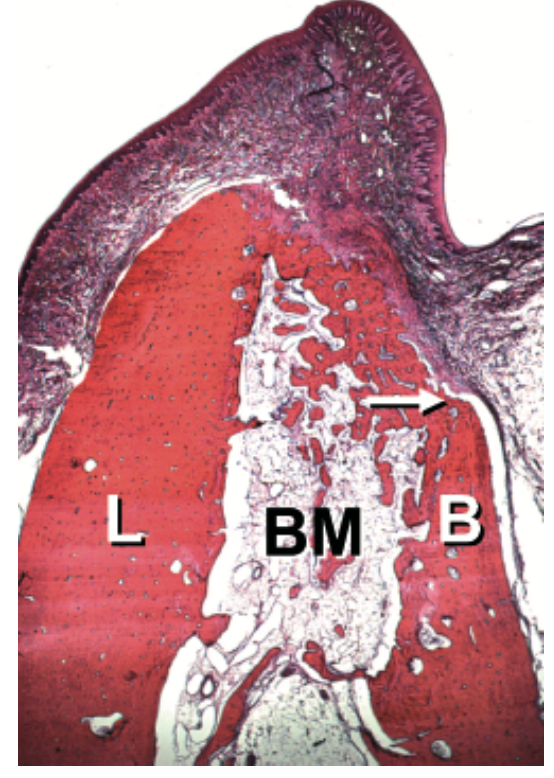
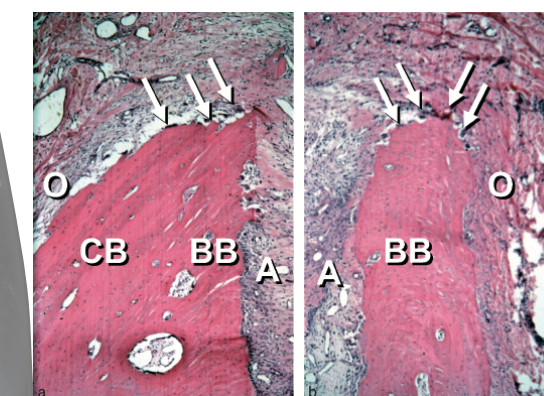
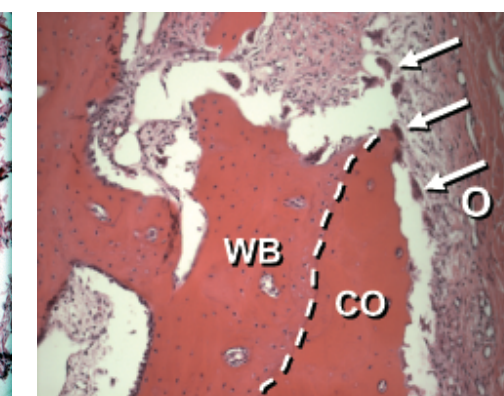
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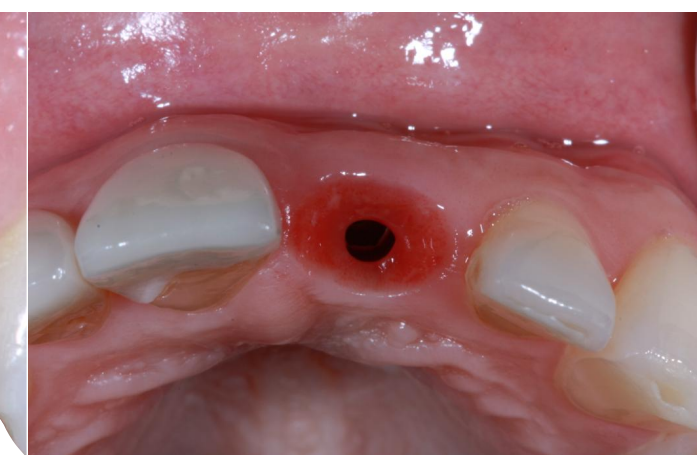
Introduction: Rehabilitation in the anterior region requires specific conditions for success, such as the presence of papilla, emergence profile of the prosthesis, and balance between pink and white esthetic. During long time until nowadays immediate implant and immediate restoration should only be done when favorable conditions is present, such as integrity of the alveoli and minimal or none gingival alterations. Otherwise, there is a minimum rate of patients that shows this condition when losing a tooth, and even worse when this tooth is in the anterior region of the maxillae.



Bone alterations after tooth loss: the inner aspect of the alveoli is surrounded by a bone called fasciculated bone which is fully dependent of the periodontal ligament. This bone will be totally remodeled after the tooth extraction. When the width of the buccal plate is thick the fasciculated bone is associated with a cortical plate, which remains, maintaining the architecture of the ridge. This differentiate the type of healing when facing different gingival phenotypes: one suffer less resorption and minimal alterations - thick phenotype, while other will remodel more and can lead to gingival recession - thin phenotype.



Araujo & Lindhe, 2005: Histological analyses of the ridge healing after tooth extraction. After 8 weeks the fasciculated bone was totally remodeled and the bone resorption diminish it intensity when in presence of cortical bone. The cervical region in at the buccal plate was absent after 8 weeks, leading to a apically margin migration.



Buccal plate vascularization: there are three main blood supply to the buccal plate: from the periodontal ligament, which will be lost after tooth removal; from the periosteum that can be lost if were made flap release; and from the harvesian system, which will be absent in thin phenotype, due to the thin buccal plate, that show no dimension for the blood vessels2. This can explain why there is more bone resorption in the central area of the buccal plate when compared with the interproximal area3.

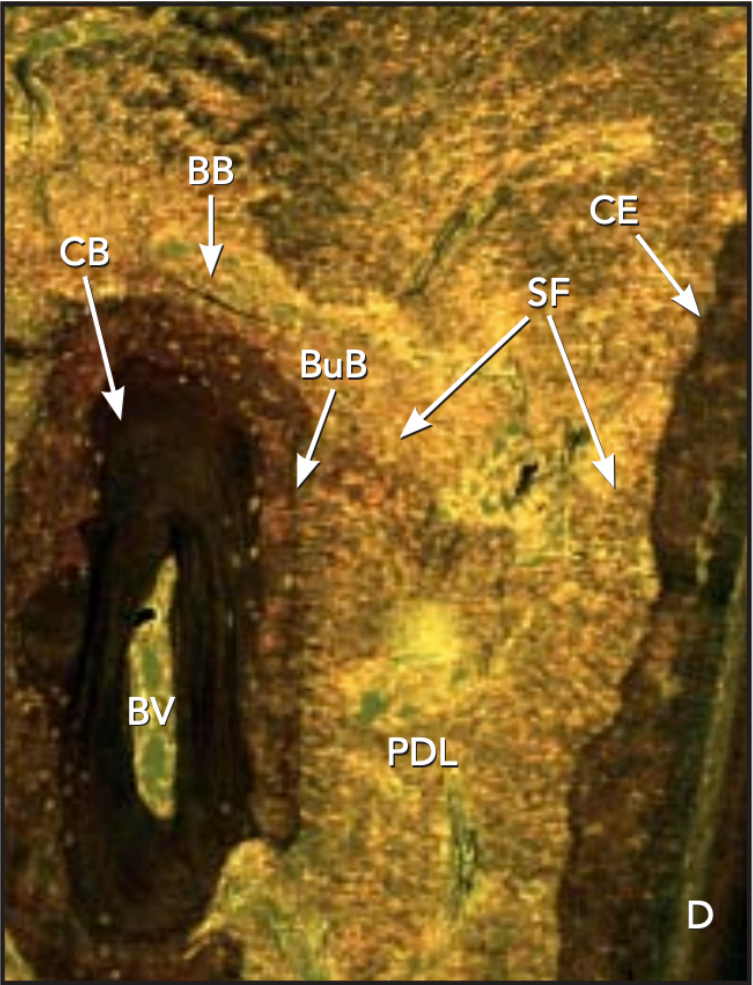


Fig 1 Photomicrograph showing the buccolingual section of a tooth with the surrounding buccal bone, which has a large Haversian blood vessel (retic stain, magnification ×4). BB = buccal bone; CB = cortical bone; BuB = bundle bone; PDL = periodontal ligament; CE = cementum; SF = Sharpey fibers; BV = blood vessel; D = dentin.

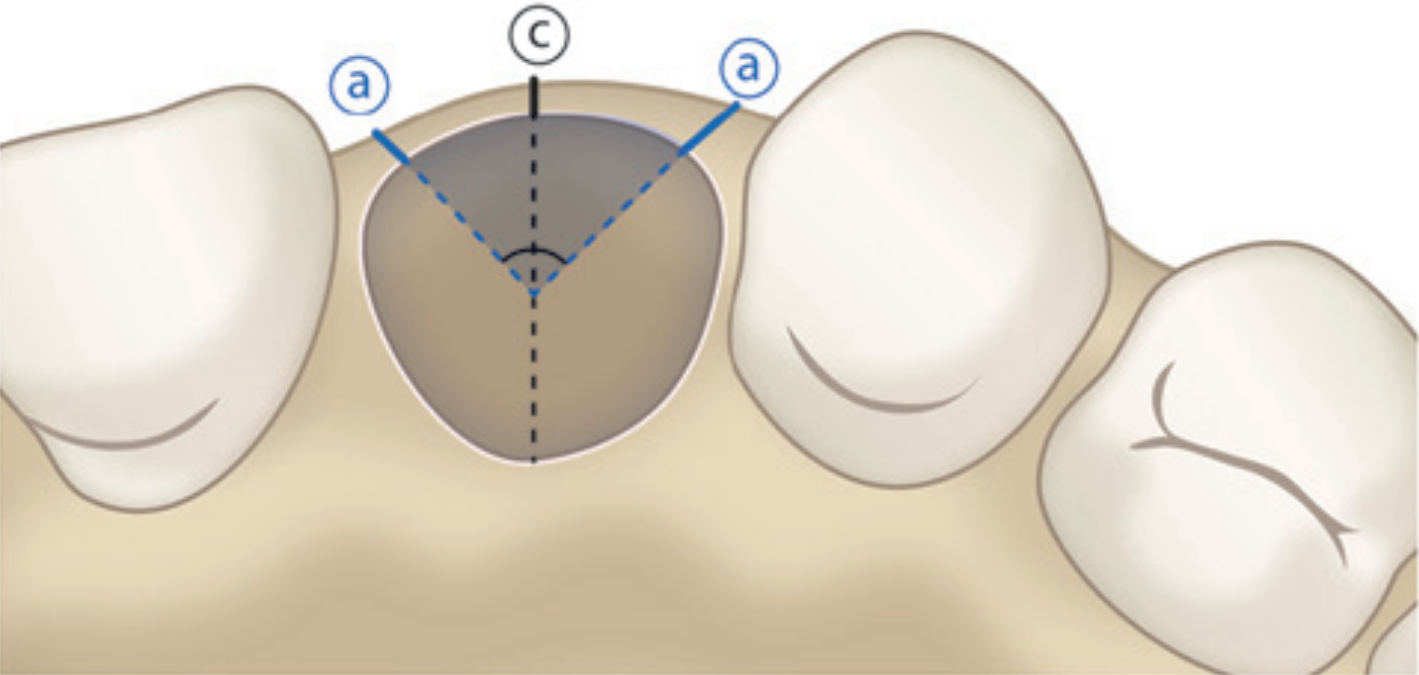
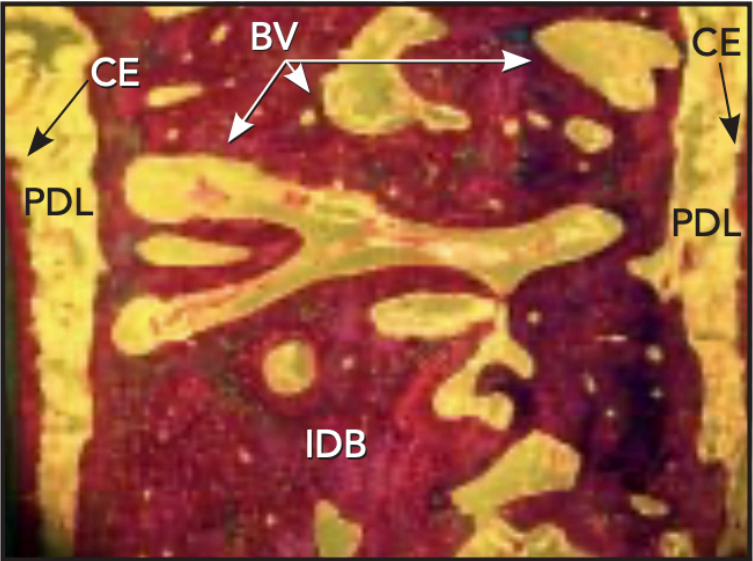


Fig 2 Photomicrograph of the interdental bone (IDB) in the mesiodistal direction showing the large Haversian system (retic stain, magnification ×4). CE = cementum; BV = blood vessel; PDL = periodontal ligament.

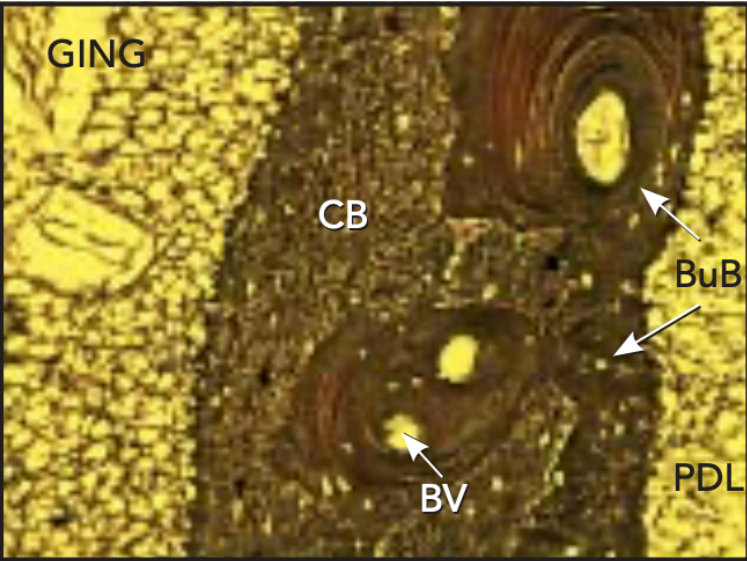
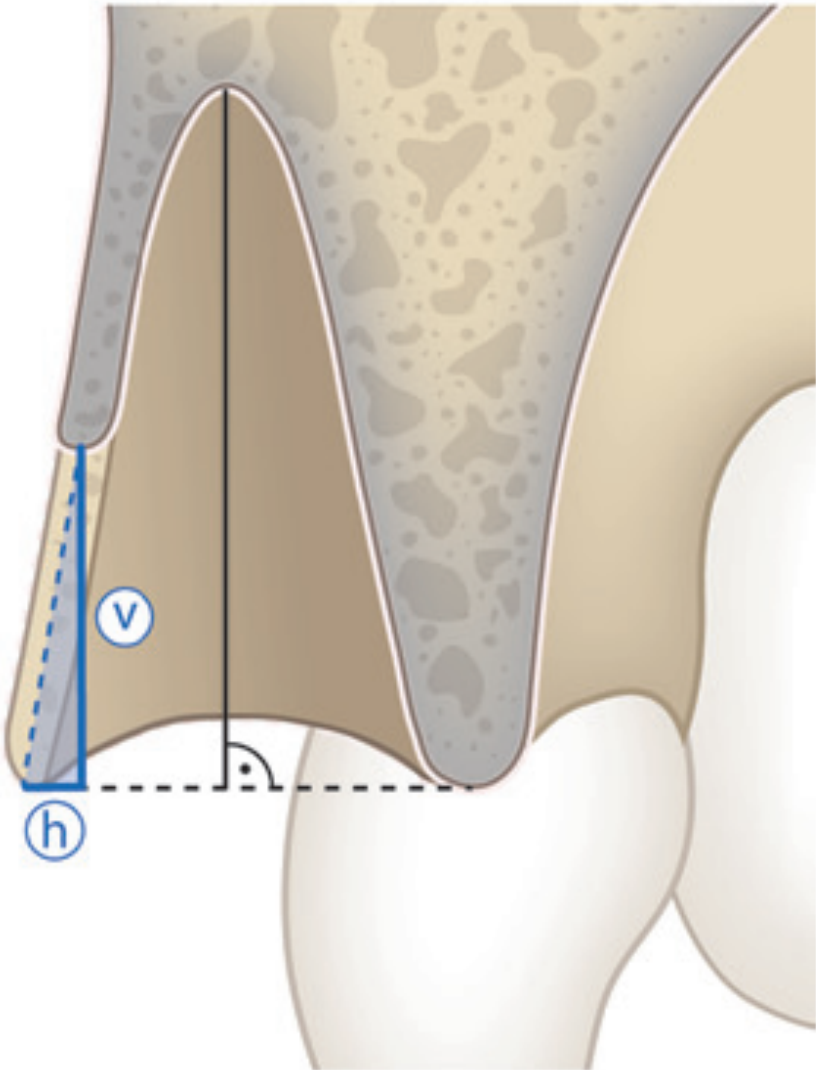


Fig 3 Photomicrograph of the buccal bone in higher magnification showing the thickness of the bundle bone adjacent to the blood vessel in the Haversian system (retic stain, magnification ×60). GING = gingiva; CB = cortical bone; BuB = bundle bone; PDL = periodontal ligament; BV = blood vessel.



Question : if the buccal plate will be lost after tooth extraction, why do I have to concern if it is present or not? Does the buccal plate is necessary in achieving esthetic results in immediate implant and provisionalization?



Is the facial bone wall critical to achieving esthetic outcomes in immediate implant placement with immediate restoration? A systematic review

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A – research concept and design; B – collection and/or assembly of data; C – data analysis and interpretation; D – writing the article; E – critical revision of the article; F – final approval of the article

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Abstract

Background. Rehabilitation in the anterior region requires specific conditions for success, such as the presence of papilla, emergence profile, and balance between pink and white esthetic.

Objectives. This systematic review aimed to evaluate the esthetic risk associated with immediate implant placement with immediate restoration in the anterior superior area, where the facial bone plate may be absent or deficient.

Materials and methods. The search was done in PubMed, Embase, Cochrane, Lilacs, Scopus, Scielo, and Google Scholar databases. The investigation involved clinical studies and observational studies published between January 2012 and July 2023. Studies were excluded if there was less than 12-month follow-up, no immediate restoration or facial defect, heavy smokers, or systemic disease. The risk of bias was assessed through the ROBINS-I and Modified-Cochrane RoB tools.

Results. Twelve studies were included in this systematic review. The thinner the facial plate, the higher the alveolus's risk of gingival recession or shrinkage. There was an increased interproximal recession when the thin phenotype was associated with flap surgery. An increase in PES was reached when IIP and immediate restoration were done. Soft tissue augmentation achieved more gingival-level stability. Regardless of the initial phenotype, an esthetic outcome was delivered. The risk of bias was high in 1 study and moderate in 3 studies.

Conclusions. It is possible to conclude that esthetic results and increased **final pink esthetic score (PES) or patient satisfaction index in immediate implant placement (IIP)** treatments associated with immediate restoration could be obtained even in buccal bone wall defects or gingival recession, regardless of their extension.

Key words: esthetic region, facial bone plate deficiency, immediate implant placement, immediate restoration, peri-implant recession





The role of the soft tissue:

Even though no recession was detected, the palatal position of the implant associated with a subcritical prosthetic contour allowed tissue growth. Therefore, soft tissue depression or color change was observed when the autogenous soft tissue was not used. (Implant used: Black fix Profile 4.0x13 - titanium fix, SP. Brazil)



Conclusion

Considering the limitations of this systematic review, the consensus was that an esthetic result and increased final PES or patient satisfaction index in IIP treatments associated with immediate restoration could be obtained even in the presence of buccal bone wall defects or gingival recession, regardless of their extension. Thus, there is no absolute contraindication for this type of treatment, but extreme attention to the treatment plan is recommended.



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