IMPLANTS
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Implants Versus FPDs for Single Anterior Tooth Replacement

By Frank Spear (/spear-review/author/frank-spear/) on October 29, 2018 | (/bookmarks/bookmark/38625) SHARE

It's important to identify what variables need to be evaluated in making a decision, recognizing that ultimately there will be times where either choice is acceptable.

I find it helpful when evaluating different treatment modalities, to break the assessment down into the same categories used in the Facially Generated Treatment Planning process: Esthetics, Function, Structure and Biology.

The category of **Esthetics** deals with fundamental issues such as: Tooth position, gingival levels, papilla levels, tooth arrangement, contour and color.

The category of **Function** assesses: joint issues, muscle issues, occlusal relationships, tooth wear, mobility, fractures and looking for an occlusal etiology.

Structure refers to how we restore or replace teeth, and understanding the existing condition of all teeth, which teeth need restorations or replacement, and what options exist for the restoration or replacement.

Biology refers to assessing all soft tissues, including gingiva, for health or disease, and the treatment options necessary for correcting soft tissue problems. The same is done for bone as well.

All of these categories must be evaluated when making a decision between single tooth implants and fixed partial dentures **(FPD)**.

Although I will list each category in a specific order, the key is to evaluate each of the points, not necessarily follow the exact order. Soft tissue and osseous requirements for an acceptable single tooth implant (https://www.speareducation.com/spear-review/category/implants) are more demanding than an FPD so I usually start my decision process with a biologic assessment.

Biology 1

Facial bone: Is the available bone adequate in width and height for implant placement? If not, is augmentation a realistic possibility? If augmentation is possible, will the patient be willing to go through the necessary surgeries? If not, an FPD will be the best treatment (See Fig. 1).

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Fig. 1

While a single tooth posterior molar implant can be acceptable if there is adequate bone for placement and integration, there are much greater demands for an esthetically excellent single anterior implant. In fact, significant facial recession is one potential complication of a single tooth anterior implant when the facial bone and soft tissue thickness is not adequate [1].

Biology 2

Interproximal bone on the teeth adjacent to the potential implant: An esthetically excellent single tooth anterior implant is dependent upon the interproximal bone on the adjacent teeth for its papilla height, and on the facial bone level and soft tissue thickness for a pleasing gingival margin.

Research reports an average papilla height of 4.5mm above the bone on the adjacent teeth as a predictable papilla level following implant treatment [2], this means if there is interproximal bone loss on the adjacent teeth, the papilla between the teeth and implant may be esthetically unacceptable.

In this case, an ideal result will require orthodontic eruption of the adjacent teeth to move the interproximal bone to a more coronal position. The eruption may result in the adjacent teeth needing subsequent facial crown lengthening and restoration (See Figs. 2, 3 and 4).

Fig. 2

Fig. 3

Fig. 4

In these cases a connective tissue graft and FPD, or an FPD using pink ceramic or composite to replace the inadequate papilla height may be a more predictable esthetic (/spear-review/2013/08/evaluating-facial-esthetics-facial-profile) option than the compromised single tooth implant unless the patient considers the orthodontic eruption.

Biology 3

Space for the implant, specifically between the contacts of the adjacent teeth, at the crest of bone and between the roots near the apex: Maxillary laterals and mandibular incisors are the most difficult teeth to manage for adequate space, but with modern 3-3.3mm implants, a space of 5-5.5mm is typically adequate for placement.

If adequate space doesn't exist, orthodontics will be necessary to create it or else an FPD is indicated (See Fig. 5).

Fig. 5

Biology 4

Age and facial growth: We know if an implant is placed it will not erupt over time like natural teeth. For this reason, especially on single anterior implants, it is necessary for facial growth to be complete prior to implant placement. If not, as vertical facial growth continues, the teeth will erupt and the implant will appear to intrude (See Fig. 6).

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Fig. 6

There is no specific age that everyone stops growing, but rather a range of ages. My team has traditionally used serial cephalometric radiographs done one year apart to monitor facial growth. If the two radiographs were identical, we would consider implant placement. If the newer radiograph shows vertical facial growth, we would wait a year and do another radiograph.

There are also large differences between when growth stops for females as opposed to males [3]. We would do the first radiograph in a female around age 17 or 18, but in a male not until age 20 or 21.

If growth is not complete, a conservative bonded FPD is an excellent interim restoration until growth is complete (See Figs. 7, 8, 9, and 10).

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Fig. 7

Fig. 8

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Fig. 9

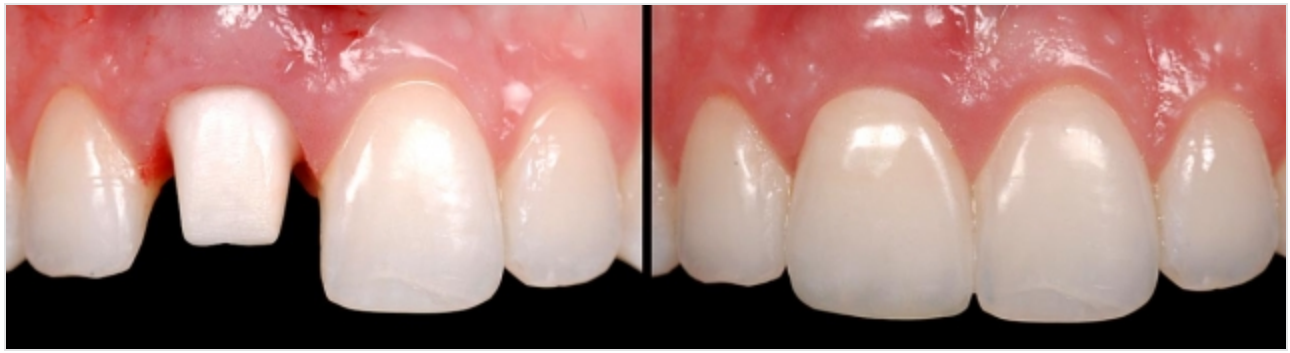

Fig. 10

Biology 5

Size of the pulp is an issue when replacing single anterior teeth in young patients. If the pulp is extremely large, a conservative bonded FPD is an excellent alternative to prepping a tooth for an aggressive restoration.

The biologic assessment is heavily weighted in determining the viability and acceptability of placing a single tooth implant. The next category that's important to look at is **Structure**, the condition of the adjacent teeth next to the potential pontic or implant site. Structural issues frequently suggest or diminish the option of choosing an FPD as opposed to the implant.

Structure 1

Are the adjacent teeth restored, or do they need restoration? If the adjacent teeth are not restored and don't need a restoration, it represents one of the major advantages of a single tooth implant—the ability to replace the tooth without involving unrestored teeth.

If the adjacent teeth aren't restored, and it is necessary to use an FPD due to the patient's growth status, lack of bone, or inadequate space for an implant, a conservative bonded option is generally a better choice than one with full coverage retainers. This is especially true if the lateral incisor is being restored as it can often be cantilevered successfully from the canine [4].

Even if the patient is in their 20s and requires single tooth replacement but won't consider an implant, I prefer to use a bonded FPD if the adjacent teeth are unrestored. It won't have the same lifespan as a conventional FPD, but it can always be replaced with a more definitive form of tooth replacement in the future; our methods of tooth replacement continue to improve with time.

If the adjacent teeth are restored and the restorations need to be redone, or if the teeth need restoration, the advantages of the implant are reduced. However, one could argue that having all single units is still enough reason to choose the implant (See Figs. 11, 12 and 13).

Fig. 11

Fig. 12

Fig. 13

Structure 2

The condition of the adjacent teeth are compromised to act as abutments for an FPD. There have been excellent clinical studies comparing the longevity of FPDs with and without non-vital abutments. These same studies have evaluated the longevity of single crowns on vital or non-vital teeth. For the single crowns there is very little difference in estimated 20-year survival rates, 75 percent versus 79 percent.[2] However, the presence of a non-vital abutment does significantly decrease the estimated 20-year success of three-unit FPDs: 83 percent versus 60 percent [5]. The numbers even get worse for more than three-unit FPDs, or cantilever FPDs with a non-vital abutment (See Figs. 14, 15 and 16).

Fig. 14

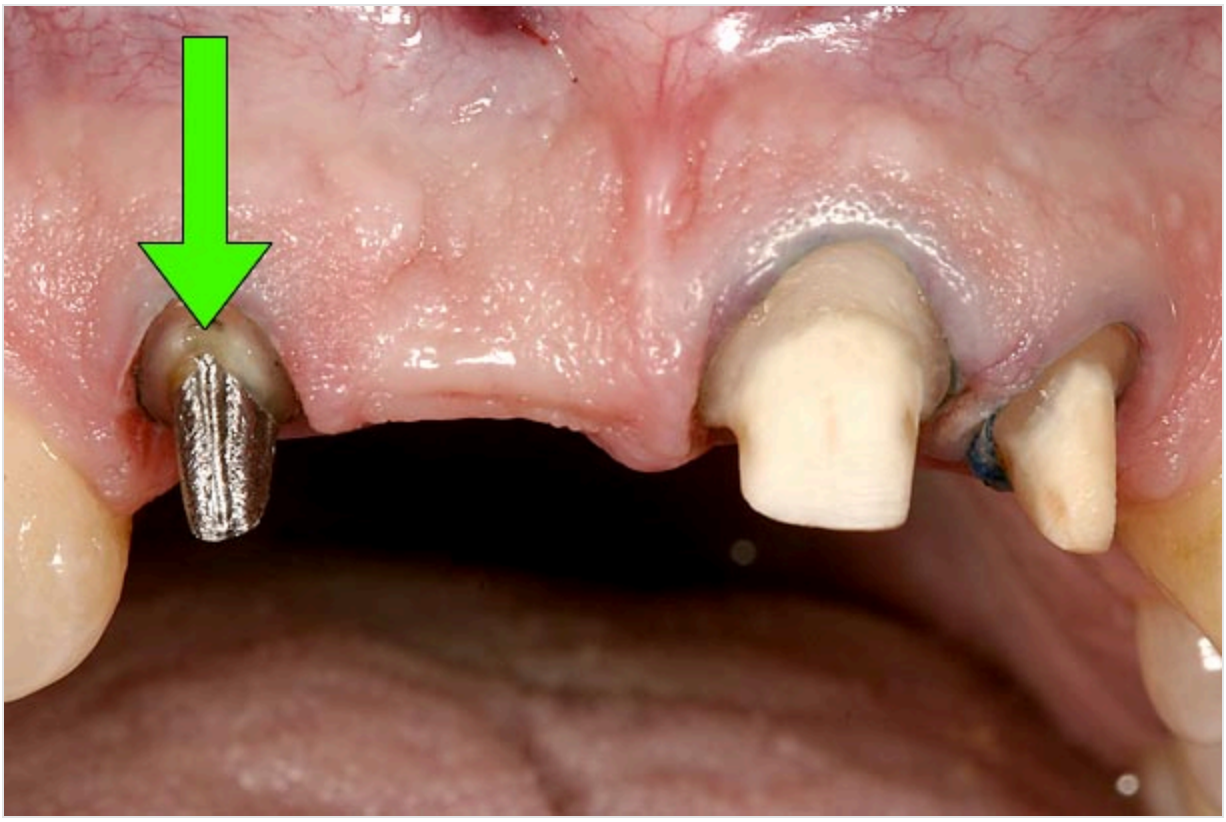

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Fig. 15

Fig. 16

Structure 3

Which tooth is being replaced? If the lateral incisor is the tooth being replaced, it is well supported by the literature that a cantilever FPD is a highly successful option, even using a conservative bonded retainer. Dr. Kern reported a 94 percent, 10-year success rate with such restorations (See Figs. 17, 18, 19, 20 and 21). If on the other hand the centrals or canines are being replaced, a cantilever FPD is probably not a good option.

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Fig. 17

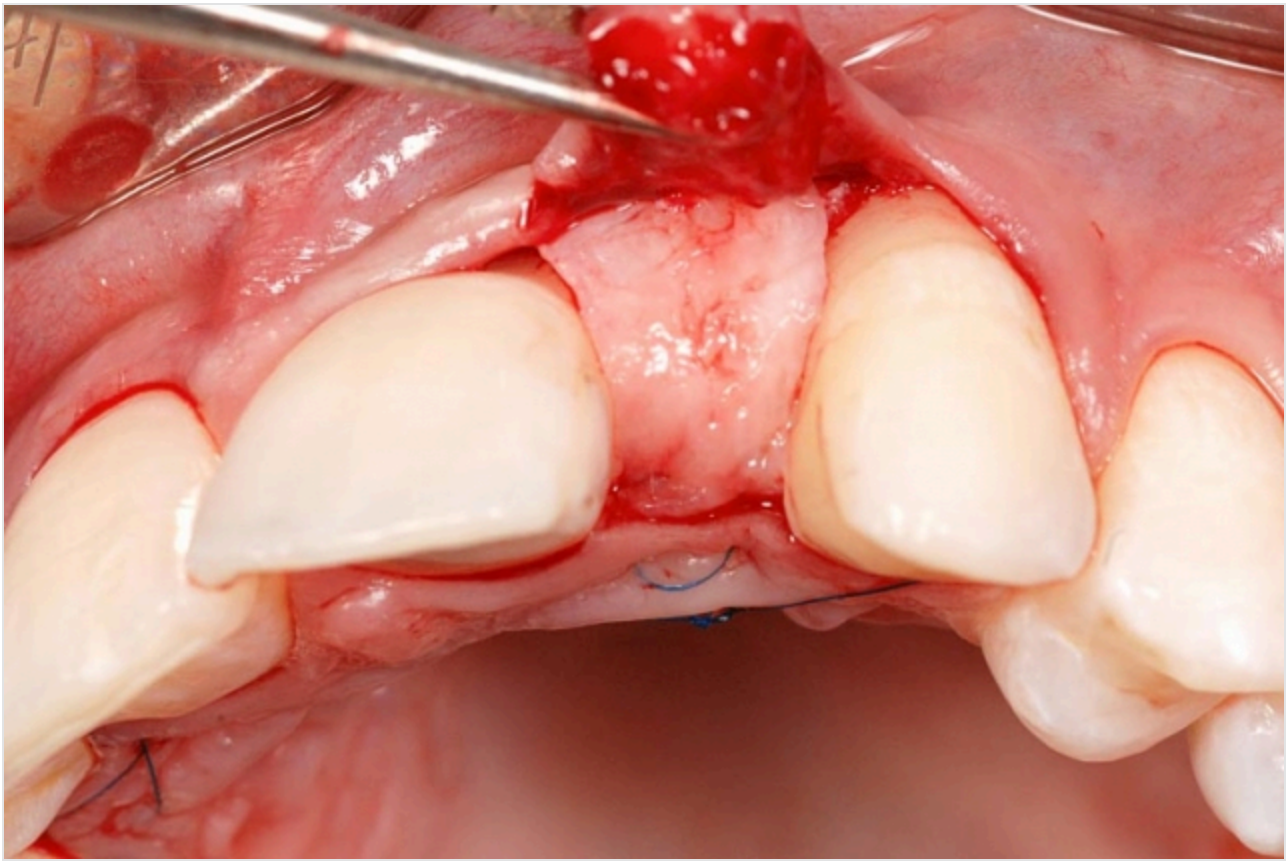

Fig. 18

Fig. 19

Fig. 20

Fig. 21

Functional considerations and concerns for single anterior tooth replacement are overbite/overjet relationships, mobility and parafunctional habits.

Function 1

Overbite/overjet, (deep bite): The concerns about the anterior relationship related to both the occlusal forces applied to the restoration, as well as, the room available for the restoration.

There are deep bite relationships that are almost impossible to gain space for an implant, abutment and final restoration. Additionally, if an implant is placed it will make any future orthodontic correction of the occlusal relationship extremely difficult because the position of the implant would be related to the existing less than ideal tooth position. As a general rule, especially in younger patients, I would avoid single tooth implants in extremely deep bite situations.

Deep overbites also make doing bonded bridges extremely difficult because there is no room for the lingual wings without significant tooth preparation. Also, a deep overbite has been shown to significantly reduce the lifespan of resin bonded FPDs [6].

The best alternative for patients with a missing anterior tooth and a deep overbite is orthodontics to correct the occlusal relationship, following orthodontics the single tooth implant or bonded bridge become more predictable (See Fig. 22).

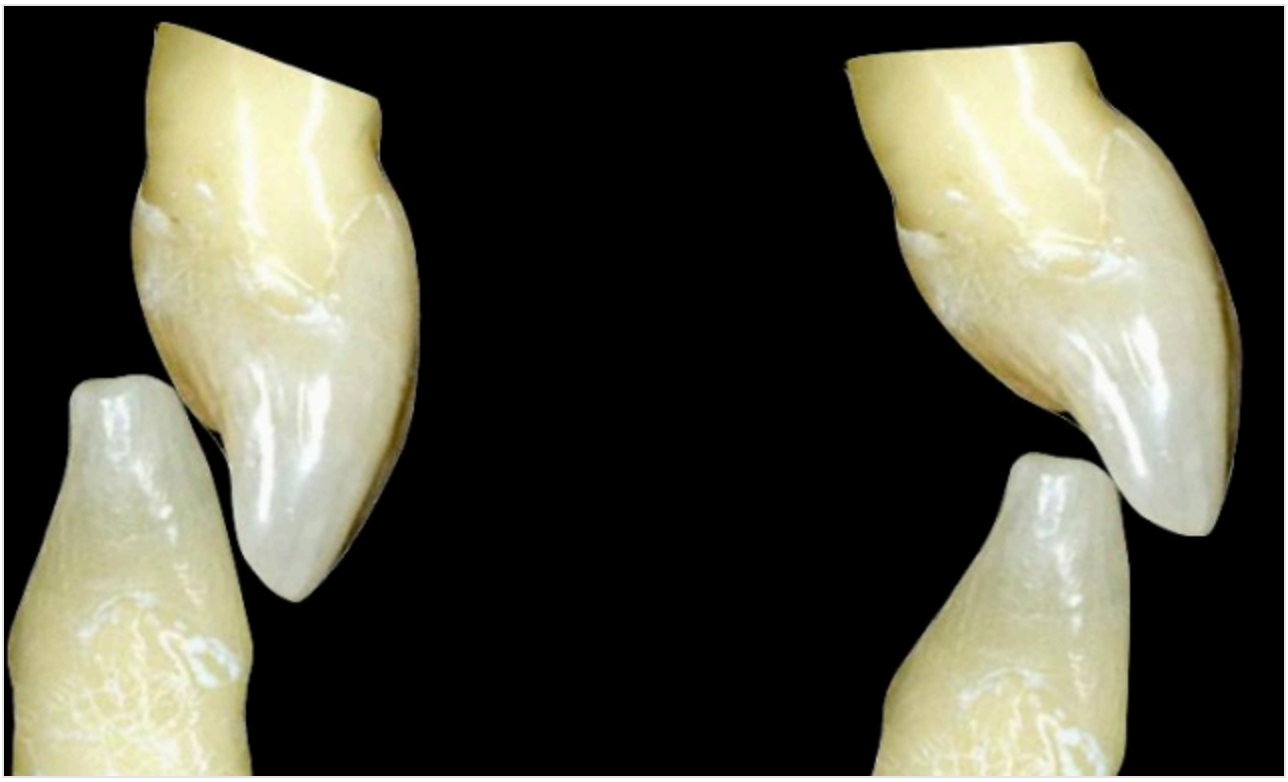

Fig. 22

If the patient won't consider orthodontics at this time, a full coverage FPD may be the most predictable option, but preferably out of a material that has adequate strength in thin sections to minimize lingual tooth reduction, such as metal, or Zirconia (https://online.speareducation.com/course/adjusting-and-polishing-zirconia-restorations).

Function 2

Mobility: Tooth mobility levels can significantly affect the success of the different tooth replacement options. Mobility can be the result of excessive occlusal forces, inadequate root length, or unfavorable occlusal relationships. If the source of the mobility can be identified and controlled, then mobility is no longer an issue. If the mobility cannot be controlled, the clinician needs to know how the mobility impacts the choice of tooth replacement.

Differential mobilities can be a recipe for a disastrous bonded FPD experience. If we chose to replace a missing lateral using a canine with a normal level of mobility as one abutment, and the central abutment was excessively mobile, the least mobile tooth—in this case the canine—will almost always be the one that de-bonds. In these cases a cantilever off the canine is a much better choice than involving the central, whether it is a bonded or conventional retainer on the canine.

When replacing a central using central and lateral abutments that are slightly mobile for a conventional three-unit FPD, the outcome is much better. When both abutments are equal in mobility, and when the direction they move under load is similar, as it is with a central and lateral, these restorations can be very successful long term. In fact, tying them to non-mobile canines only complicates the prosthesis and puts the canines at risk (See Fig. 23).

Fig. 23

Mobility's impact on implants is a more complex story. If we replace a single central with an implant, and the adjacent anterior teeth are mobile, it means they will simply move out of the way under load and all the occlusion will now be on the implant. If you use a single anterior implant in a patient with mobile anterior teeth, it is beneficial to be sure the teeth still provide most of the occlusal contacts during excursions to avoid the implant handling all the contact.

Function 3

Future tooth position changes: As mentioned above when discussing deep overbite, anytime you believe a change in anterior tooth position would benefit the patient from a functional perspective you must be careful about using a single anterior implant because it will be positioned relative to the existing teeth. Any future orthodontic corrections will almost always be compromised by the placement of the implant. In these patients an FPD is often a better alternative.

Esthetics is the last area of concern, but relates heavily to the already analyzed area of **Biology**. The esthetic outcome of a single tooth implant can be exceptional, but is completely dependent upon the surrounding soft tissue, which is dependent upon the underlying bone.

Esthetics 1

Patient demands: If the patient desires a structurally sound tooth replacement that leaves their adjacent teeth untouched, and is not critical esthetically, a single tooth implant is a great choice even if the final soft tissue result is an esthetic compromise.

If the patient has a high lip line, is esthetically demanding, and won't accept compromise, the bone and soft tissue will need to be excellent for an acceptable single tooth implant (See Figs. 24 and 25).

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Fig. 24

Fig. 25

Esthetics 2

Predict a realistic esthetic outcome and present it prior to treatment. As much as implants have impacted dentistry over the last 30 years, they have their limitations. Even with many of today's newest techniques for bone and soft tissue augmentation, we still can't achieve ideal in many patients [7].

When I discuss this with patients I often talk about what is surgically possible, as opposed to what is surgically predictable. As a general rule, when bone and soft tissue are compromised, it is much easier to produce an acceptable FPD from an esthetic perspective, even if it requires pink ceramic or composite, than a compromised single tooth implant.

The goal of this article isn't to provide a cookbook as to whether a single tooth implant or FPD would be the correct choice, as that isn't possible when we are dealing with patients and their highly individual behaviors and preferences. In fact, all treatment decisions are influenced by a variable I didn't discuss: human emotion.

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