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Customizing a Custom Abutment: When a Custom Abutment Is Not Custom Enough

By John Carson (/spear-review/author/john-carson/) on February 15, 2024 | (/bookmarks/bookmark/40070) SHARE

Are you confused by the title of this article? I can see how you might be because logic dictates that you should not need to further customize a custom abutment. But, as with many things, there can be more than meets the eye.

So why would you need to customize a custom abutment? Well, unless you are doing an old-school custom cast abutment — often called a UCLA abutment (https://www.speareducation.com/spear-review/2016/05/the-abutment-option-most-dentists-overlook) — your abutment is likely milled out of zirconia (https://online.speareducation.com/course/adjusting-and-polishing-zirconia-restorations) or titanium (although I am sure there are folks out there still bonding or gluing lithium disilicate mesostructures to pre-manufactured Ti-bases.)

All these methods have a size limit that is determined by the size of the blank. If you are saying, “Yeah, but shouldn’t the size of these blanks allow for any size I might need?” The answer is yes, they should — at least in a perfect world. But as we all know, we live in a far-from-perfect world, and these blanks are not always large enough. As a result, sometimes we have to make things work, “think outside the box,” and maybe even bend some rules.

Customizing a Customizable Abutment: A Case Study

So, let’s look at a case that illustrates this. This is a periapical radiograph that represents how the case came to me.

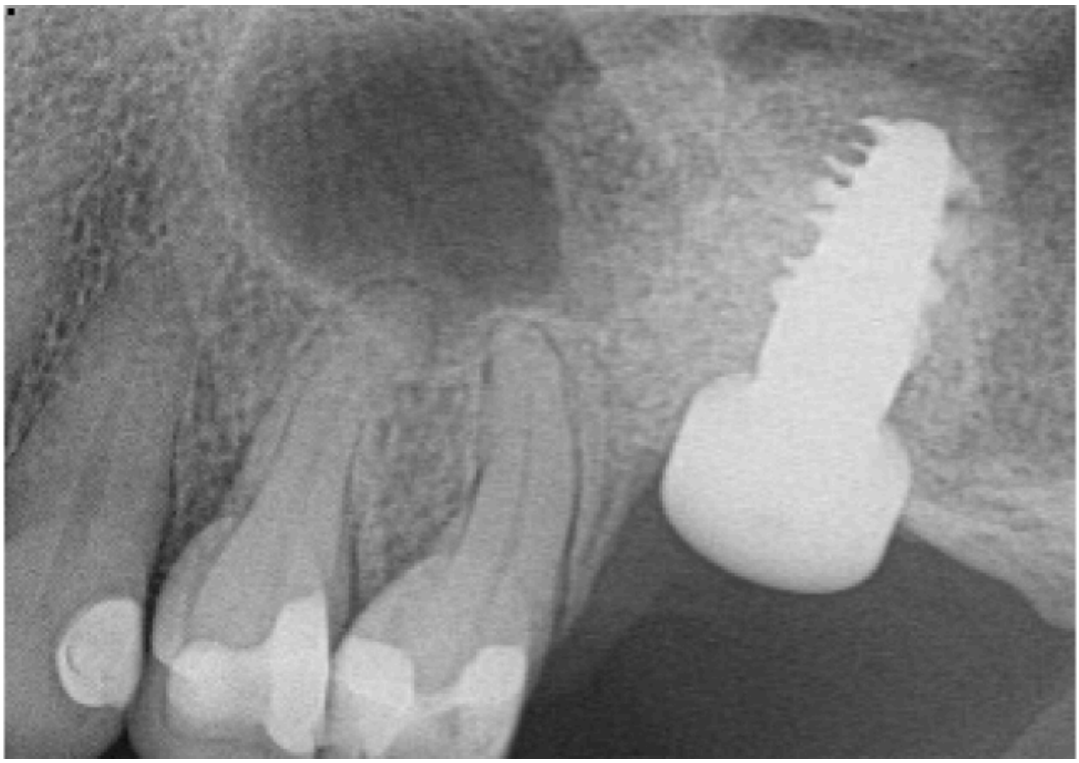

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Figure 1: How the patient presented.

Do you see anything that concerns you? Do you see more than one thing that concerns you? I hope your answers are yes and yes.

For starters, the amount of interocclusal space is *huge,* which means you have a lot of space to fill with your restoration and also means you are going to have a less-than-ideal restoration-height-to-implant (https://www.speareducation.com/spear-review/category/implants)-length ratio. While I am sure we could all list more concerns, let's focus for now on that large interocclusal space.

I don't know about you, but in my practice, I see way more issues relating to a *lack* of interocclusal space than the issue we have here, which, as we have established, is a whole heap of *excess* interocclusal space. I think it is important to note before we go further that I do not see a lot of issues with interocclusal space (https://bmcoralhealth.biomedcentral.com/articles/10.1186/s12903-019-0907-1), whether it be too much or too little, or frankly chronic issues of any kind relating to implant placement, as I and the specialists I work with make a point of planning things out well and being on the same page with each other. In other words, we work in an interdisciplinary fashion instead of a multidisciplinary fashion. I can't overemphasize how important this is.

Multidisciplinary vs. Interdisciplinary Approaches

If you are not familiar with the difference between multidisciplinary and interdisciplinary planning and treatment, here it is briefly: "multidisciplinary" describes a situation in which each clinician involved is doing what they do, with maybe some consultation with the others, but there is no real collaboration. Each party does their "thing," the others are left with whatever the others do, and everyone "gets what they get." "Interdisciplinary" is working and planning together and then conducting that plan while working together.

Which one sounds better to you? I hope your answer is "interdisciplinary." Which one sounds better for your patient? The only answer (unless they enjoy gambling with their outcomes) is also "interdisciplinary." If you are experiencing multidisciplinary planning and treatment rather than interdisciplinary planning and

treatment (https://campus.speareducation.com/workshops/treatment-planning-with-confidence/details/syllabus/), my best advice is to figure out how to change that. It will improve your life — and the outcomes for your patients.

Custom Abutment for Excessive Interocclusal Space [2]

Okay, back to the main topic here: the huge excess interocclusal space and how to deal with that. Here are a few images of the printed models for this case with the soft tissue removed.

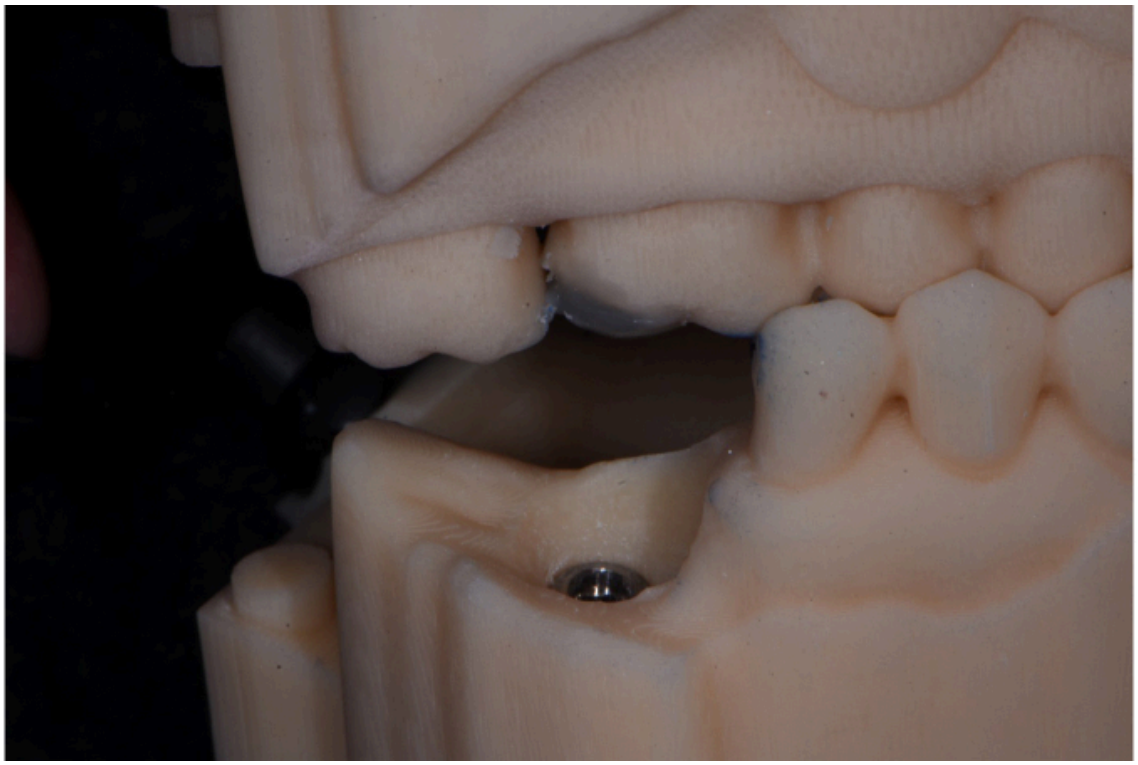

Figure 2: Printed models showing occlusal space.

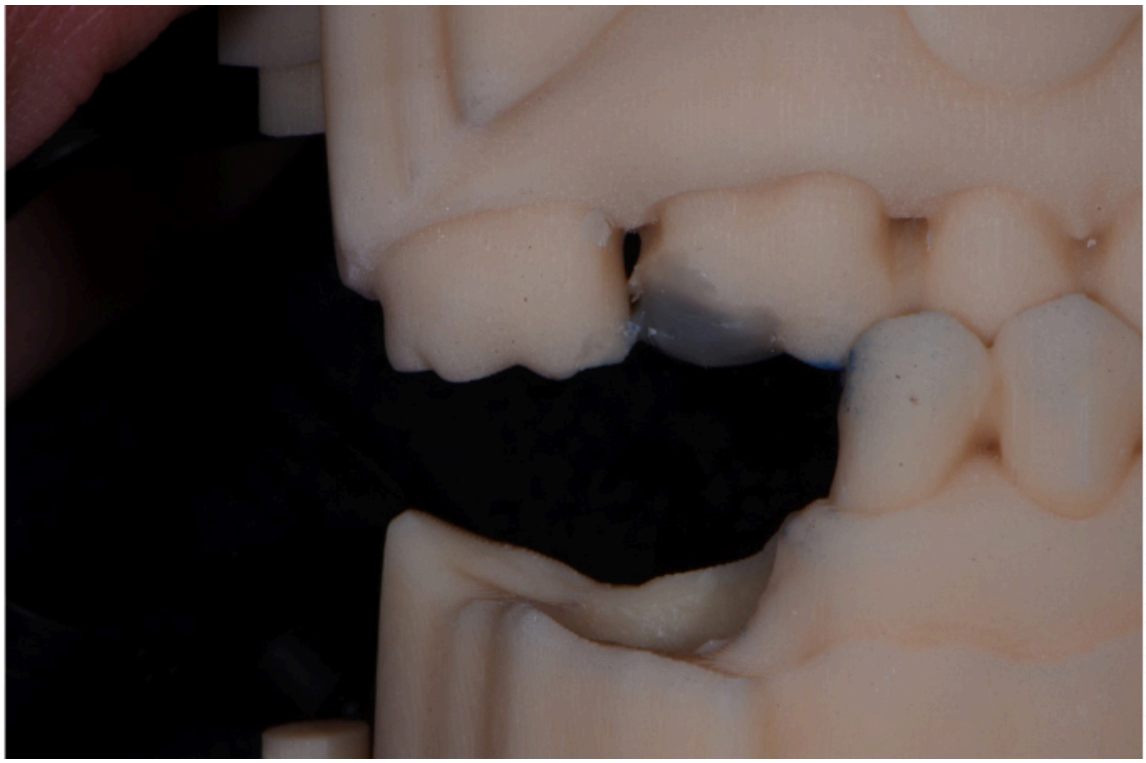

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Figure 3: Printed models showing occlusal space.

Crazy, huh? I mean, that is a *ton* of distance we have to cover. Well, it gets even better. I have yet to show you an occlusal view. So, let's look at that view on the printed models, and yes, as you can see, the soft tissue is also not present in these photos either.

Figure 4: Printed model, occlusal view.

Notice anything else you did not notice the initial PA — something I showed you and was also not apparent in the other photos of the model? The implant is placed to the lingual, isn't it? So, while the lingual extent of the implant placement was not ideal, at the end of the day, it was not as big of an issue for us as the extreme excess of the interocclusal space was. That's because the abutment manufacturer (Straumann in this case, since we always prefer to use an abutment made by the manufacturer of the implant whenever possible) could not make an abutment as tall as we would have liked (or, frankly, needed), they could help with the lingual placement and minimize that issue. If you are shocked, we were too.[2]

So, what was the solution my ceramist and I arrived at? Well, my ceramist came up with the idea of using the titanium custom abutment from Straumann as a "custom base," if you will, to support a lithium disilicate mesostructure. Doing this would not only allow us to increase the axial height of the final abutment, but it would also allow us to set the margins on the titanium custom abutment at a very subgingival level that would, of course, never be acceptable for a cemented restoration as there is no way you would have a chance at removing the excess cement. And we all know the negative ramifications of leaving behind cement on implant restorations (https://campus.speareducation.com/workshops/implant-fundamentals/details/syllabus/) after cementation, as the margins would be well beyond the recommended 1.0 mm maximum depth, which has been established in the literature.

A lithium disilicate mesostructure was then pressed to place the margins at an ideal level to allow us to easily remove any excess cement and gain the needed axial height for the definitive crown's retention onto the custom abutment. There was no other way my ceramist and I could think of to have both an acceptable margin level and axial retention if we did not make our final abutment as we did here since acceptable margin levels would have meant poor retention for the crown due to a lack of axial height. If you are wondering, "Why did you not just do a screw-retained crown," well, one reason is the access and patient cooperation were less than ideal. Also, potentially having to screw a screw-retained restoration in and out several times for adjustments was an absolute no-go for me.

So, what did our results look like? Check it out! Let's first look at the abutment itself. This image is a straight occlusal view.

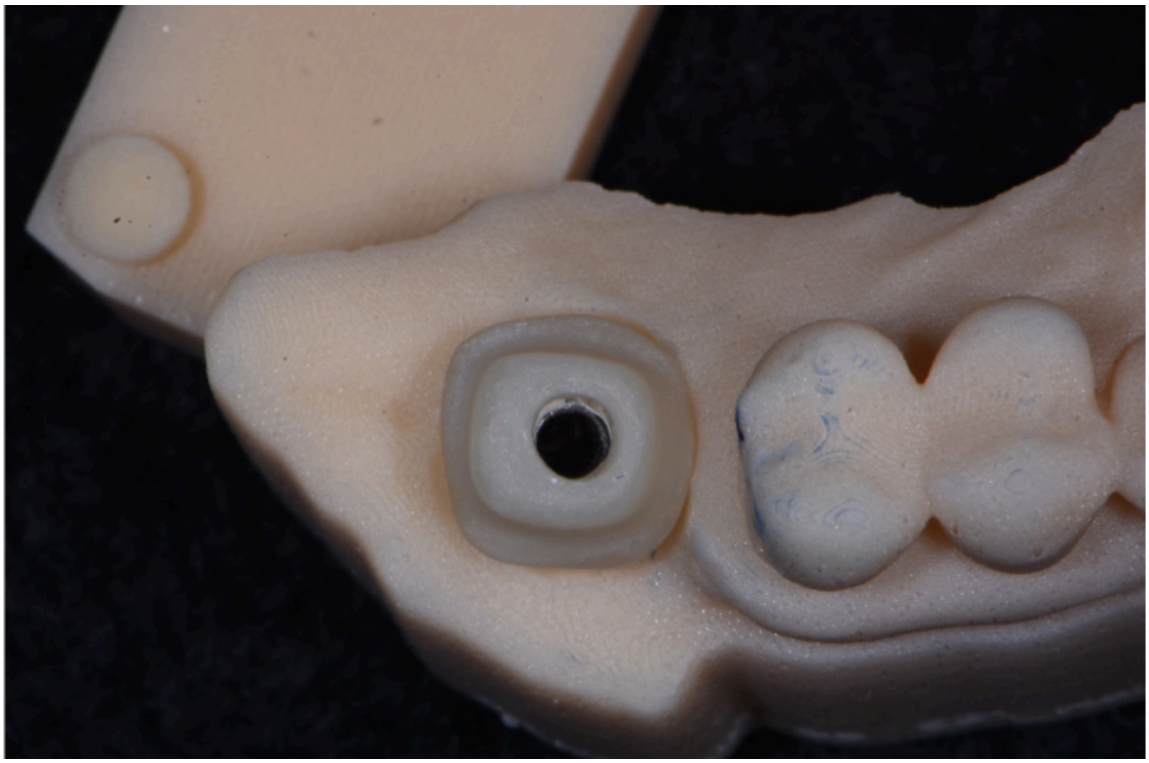

Figure 5: Abutment in place, occlusal view.

Next, let's look at an angled view from the buccal to show our gained height. You can see the custom titanium abutment and then the height we gained via the e.max mesostructure.

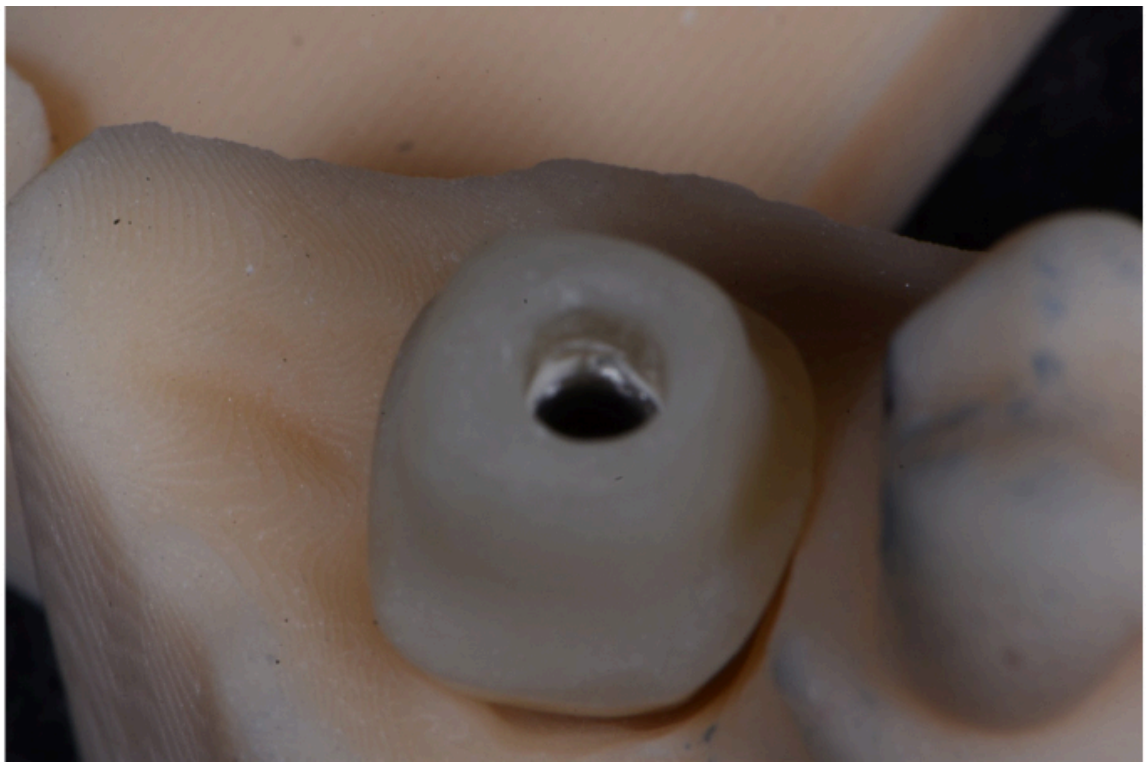

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Figure 6: Abutment in place, angled view from the buccal.

And, of course, now a view from the lingual to illustrate the amount of height we were able to gain from the angle.

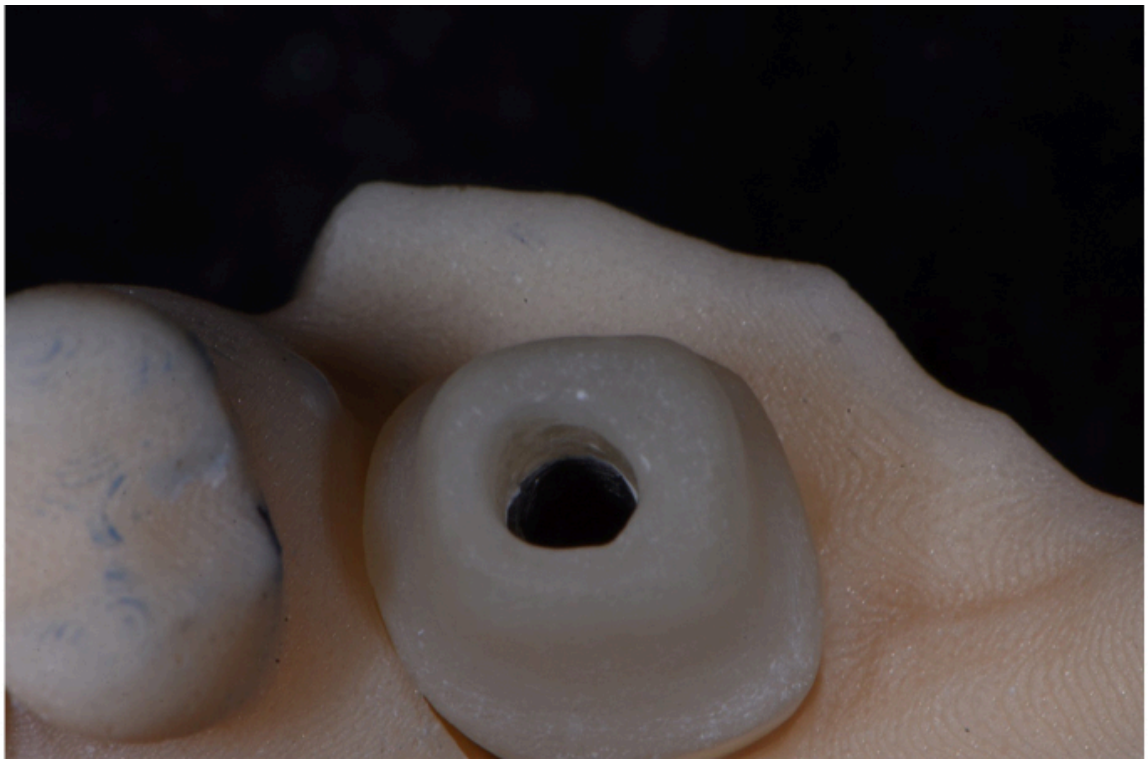

Figure 7: Abutment in place, lingual view.

Next, let’s look at the entire restorative complex (the “customized custom abutment” with the definitive crown seated on it) on the model. First, an occlusal view.

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Figure 8: Complete restorative complex, occlusal view.

And here is a buccal view.

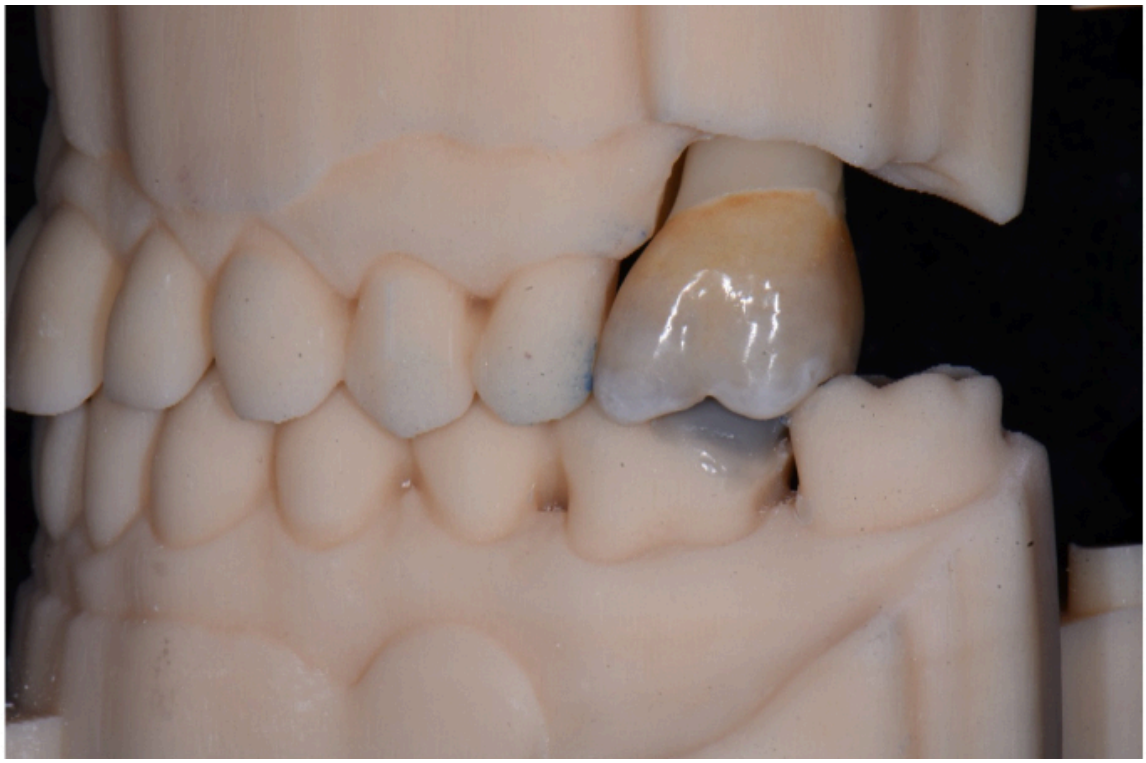

Figure 9: Complete restorative complex, buccal view.

So, I have a question for you. Does that view make you think, “Wow, looking at this image with both the “customized custom abutment” and crown in place, I realize the height that had to be closed is even crazier than I first thought”? I hope it does. It did for me — and still does when I look at these images. Oh, and if you are wondering what is on the lower first molar, we added composite to it to replicate changes that were needed to a failing crown, which is planned to be replaced.

Lastly, these are some images I took of the entire restorative complex off the model: 2

Figure 10: Complete restorative complex, off the model.

Figure 11: Complete restorative complex, off the model.

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Figure 12: Complete restorative complex, off the model.

Figure 13: Complete restorative complex, off the model.

Was this a “textbook case”? No way! Was there a better way to solve it once it was presented to my office as it did? I don’t think so. Could things have been done differently prior to it arriving as it did in my office? Maybe. However, given the amount of grafting that would have to have taken place to effect a significant difference, I am not sure — and frankly, I think the odds of that are low. And with the patient being counseled and accepting the risks (as I know they did both before implant placement and implant restoration), I can’t think of a better, less invasive, lower risk fixed solution to replace the tooth.

I hope you have found this case study of customizing a custom abutment interesting. If you have any questions or other ideas on this, please respond in the comments. I would love to hear your thoughts.

John R. Carson, D.D.S., is a member of Spear Visiting Faculty and a contributor to Spear Digest.

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