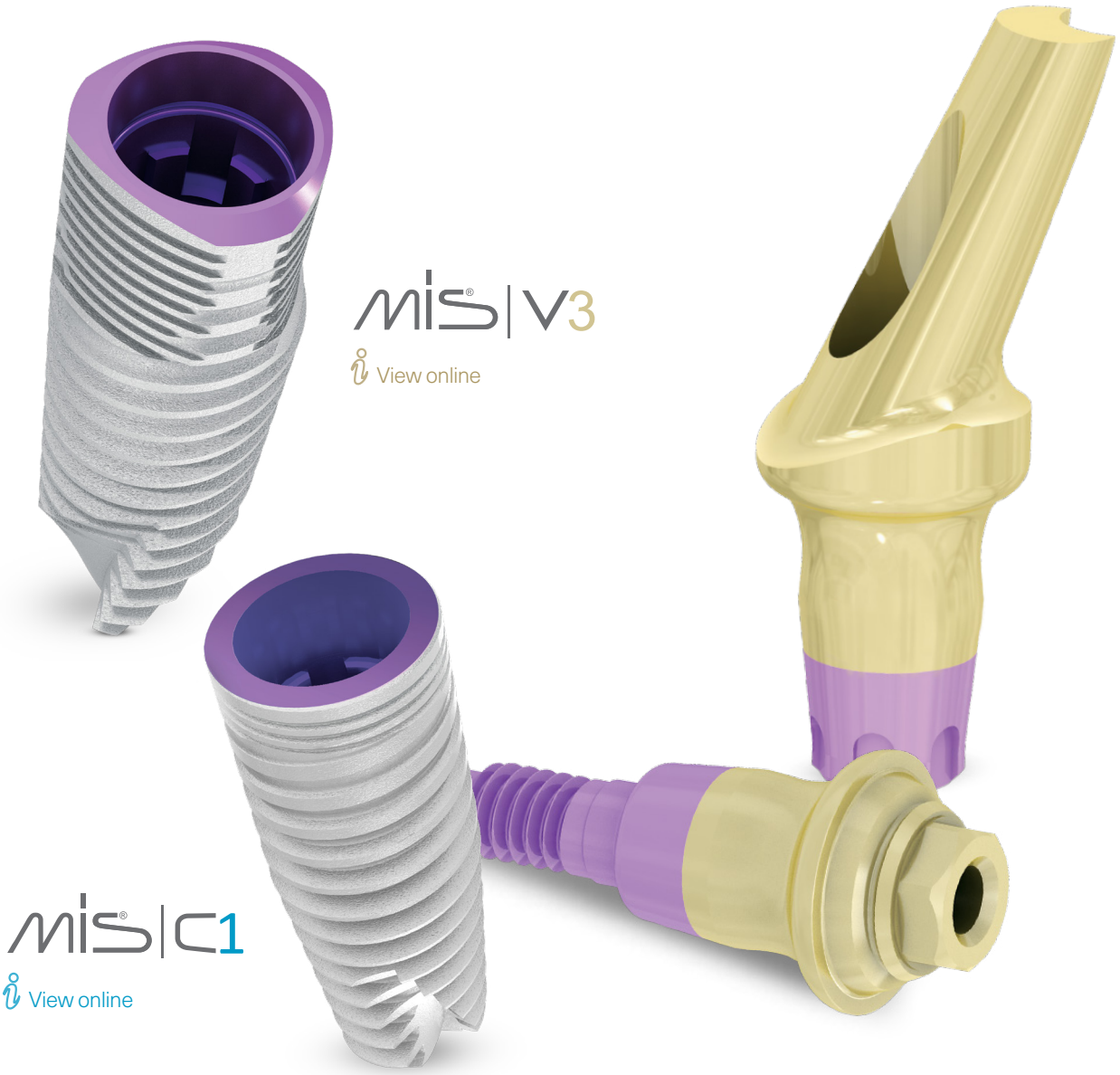
Working with the MIS conical connection

A conical connection has unquestionable mechanical and biological advantages, which are further enhanced by MIS design and geometry.

However, a conical connection demands more attention when choosing prosthetic components and is more susceptible to procedural inaccuracies.

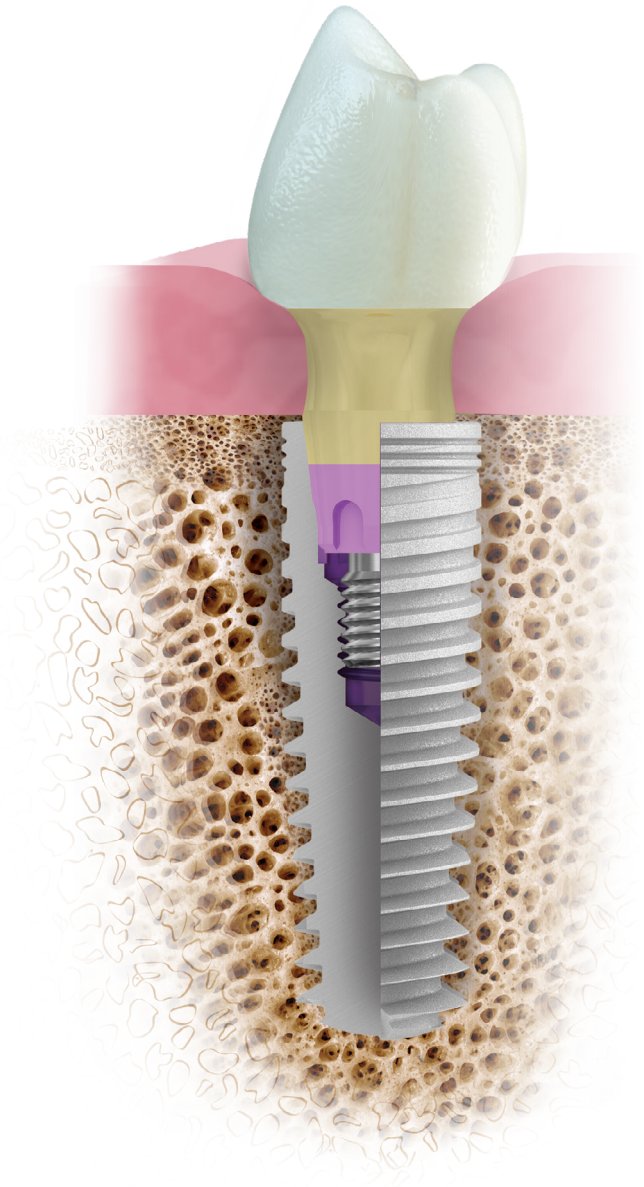
This is easily avoided with a proper prosthetic plan, appropriate component selection and simplified protocols. Following these, we can achieve long-term biological advantages while avoiding short-term challenges (as described in the following).

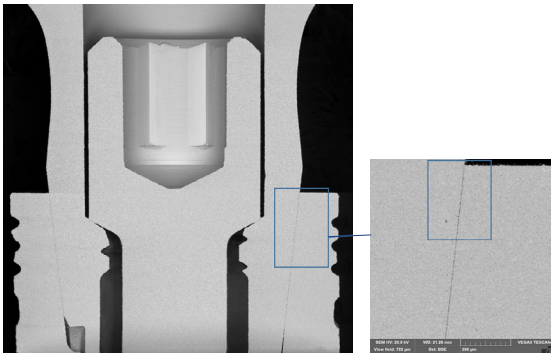


Issues to consider

Biological considerations: component interface with hard and soft tissue.

Mechanical considerations: susceptibility of the conical connection to prosthetic protocol due to the steep angle.





- Largest sealing surface
- Reduced bacterial leakage
- Most reliable under dynamic loading

Biological considerations

To ensure a long-term, stable bone level, it is desirable to have a minimum of 2-3mm mucosal height coronal to the bone crest surrounding the implant platform. This dimension may not always be available, but could be achieved if the implant platform is placed sub-crestally. To facilitate a stable crestal bone level, the implant should be shielded from mechanical and biological irritations. Additionally, the implant-abutment interface should be mechanically strong and biologically sealed, and a proper prosthetic workflow should be followed.

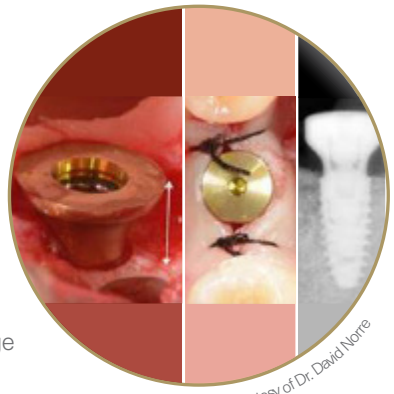
Mechanical considerations

The steep angle of the connection (which provides a more rigid and better seal) may lead to inherent vertical discrepancies and is intolerant of horizontal inaccuracies. This may require more attention from the dentist and the lab when splinting multiple-unit implant restorations (i.e., bridge).

Making it work to your advantage

Following a few simple rules of thumb will allow you to benefit from the advantages of the conical connection, while avoiding the pitfalls.

Protecting the bone



Courtesy of Dr. David Norre

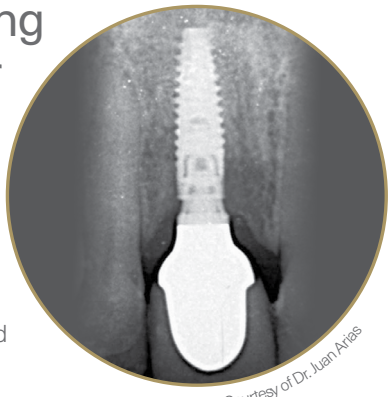
Implants with a friction-fit conical connection may be safely placed sub-crestally to facilitate an enhanced end-result.

Note that in such clinical scenarios and whenever an implant is placed next to a natural tooth, it is not uncommon to find bone coronal to the implant platform (more so interproximally). If the prosthetic phase is carried out properly, this bone will not resorb, which may result in a more esthetically desirable and sustainable treatment outcome.

Before proceeding with the prosthetic steps, the dentist must attain knowledge of the bone morphology around and coronal to the implant platform.

A radiograph must be taken with the introduction of the first component attached to the conical connection (healing abutment, impression post, prosthetic abutment, etc.).

Paying close attention when choosing the right prosthetic components for the restorative plan



Courtesy of Dr. Juan Arias

A concave-shaped abutment in the proper height, should be selected to optimize soft tissue volume and prevent damage to surrounding tissues. Therefore, the dentist should decide which abutments to use, based also on the radiographs taken.

The dentist, in collaboration with the dental lab technician, must be involved in choosing the prosthetic components.

The working model (analog or digital) does not provide all the necessary information, and a “blind” selection of the abutment shape, based solely on the gingival contour, may cause damage and bone loss.

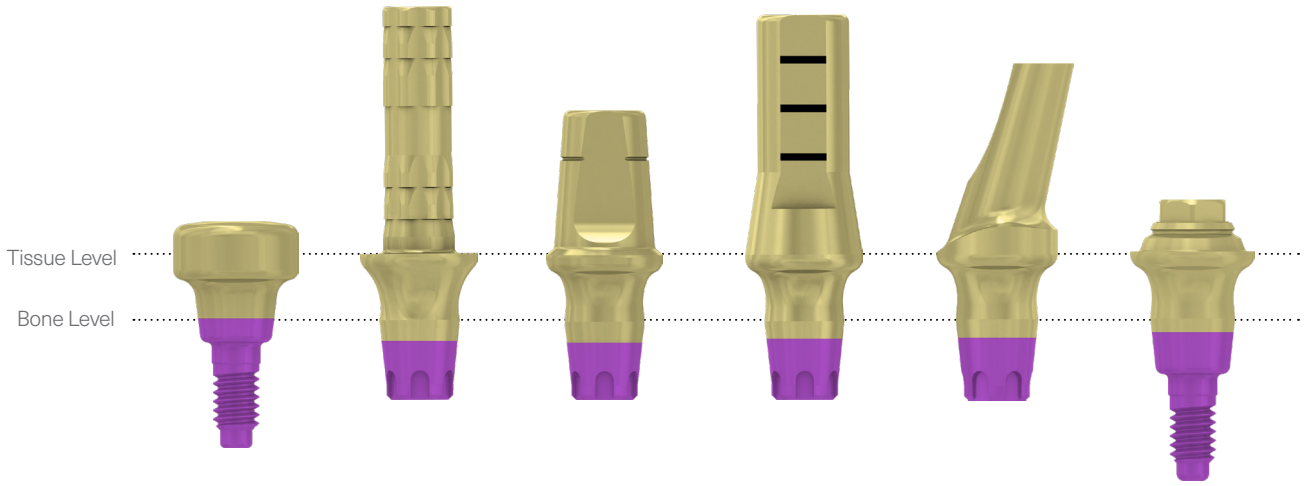
Deciding on a prosthetic design

Single unit – cemented- or screw-retained.

Multiple units – cemented- or screw-retained
(or a combination, which is beyond the scope of this manual).

Using the appropriate prosthetic components and prosthetic protocol for the selected prosthetic design.
The system provides solutions for all prosthetic designs.

Don't forget, conical connections provide inherent biological advantages and promise a more stable tissue reaction. You can further increase the chances of long-term success, by selecting various prosthetic designs and components, which adhere to a biologically oriented approach. I.e., minimize prosthetic interactions close to the bone.



Cement-retained restorations

To enhance tissue response, all MIS prosthetic components for conical connection implants have a concave emergence profile. Since excess cement may migrate along the narrow concave stem towards the bone, make sure you remove all excess residual cement!

Therefore, if you choose to provide a cement-retained restoration, select an abutment that allows the crown margins to be placed as close as possible to the gingival margins. This may facilitate convenient access when removing any excess residual cement.

*You may carefully use a barrier, such as a retraction cord, to prevent cement from migrating towards the bone. Make sure that the cord is placed beyond the margins so as not to become entrapped within the crown margins. In addition, CAD/CAM custom abutments should be designed and used as a primary choice for cement-retained restorations, as the abutment finish line and crown margins may be better managed and controlled to facilitate excess residual cement removal.

Cement-retained - multiple units

A workflow involving an abutment-level impression is advisable, due to the steep friction-fit conical connection design.

You may use abutments such as CPK, according to the following workflow:

1. Torque them into the implants (preferably, not to be removed again)
2. Make abutment level impressions
3. Lab model with abutment analogs is created
4. Bridge fabrication
5. Cement bridge on previously placed and never removed abutments.

Make sure to select abutment gingival heights so that crown margins are not placed deep below gingival margins.

Screw retained restoration - single units

For single units, it is advisable to implement a screw-retained crown whenever possible.

You may use a library-implemented Ti-base or any other suitable abutment of your choice, cement it to the crown and clean the excess residual cement prior to connecting it to the implant platform. (This step is performed by the laboratory dental technician).

The abutment-crown interface may be placed deeper in the soft tissue for better control of contours and enhanced esthetics, without risking excess residual cement. Zirconia is a preferable material where the crown is in contact with the mucosa.

Screw retained restoration - multiple units

Due to the steep, friction-fit conical connection design, it is highly recommended to select an abutment-level restoration.

The prosthetic platform should be transformed from implant level to abutment level, utilizing Multi-Unit or CONNECT abutments. Thus, a safer and more predictable prosthetic protocol may be achieved.

Multi-Unit and CONNECT abutments, secured to the implant platform, allow the entire prosthetic procedure to occur coronal to the bone, at any level of the connective tissue (impression making, provisional restoration, try-in appointment, final restoration delivery). This will protect the bone from irritation and infection which may lead to bone resorption.

In cases of implant-level, screw-retained restorations (attached directly to the implant's conical connection), it is recommended to first pre-tighten the abutments to the implant's connection, and only then cement the bridge intra-orally. This will allow a passive fit between the abutment and the final restoration, eliminating unfavorable tension inside the connection.

CONNECT abutment

Multiple and single units

The CONNECT abutment system was designed to comply with the most desirable prosthetic protocols for safer, longer lasting esthetic restorations. This is a simple and very intuitive solution for almost all clinical scenarios.

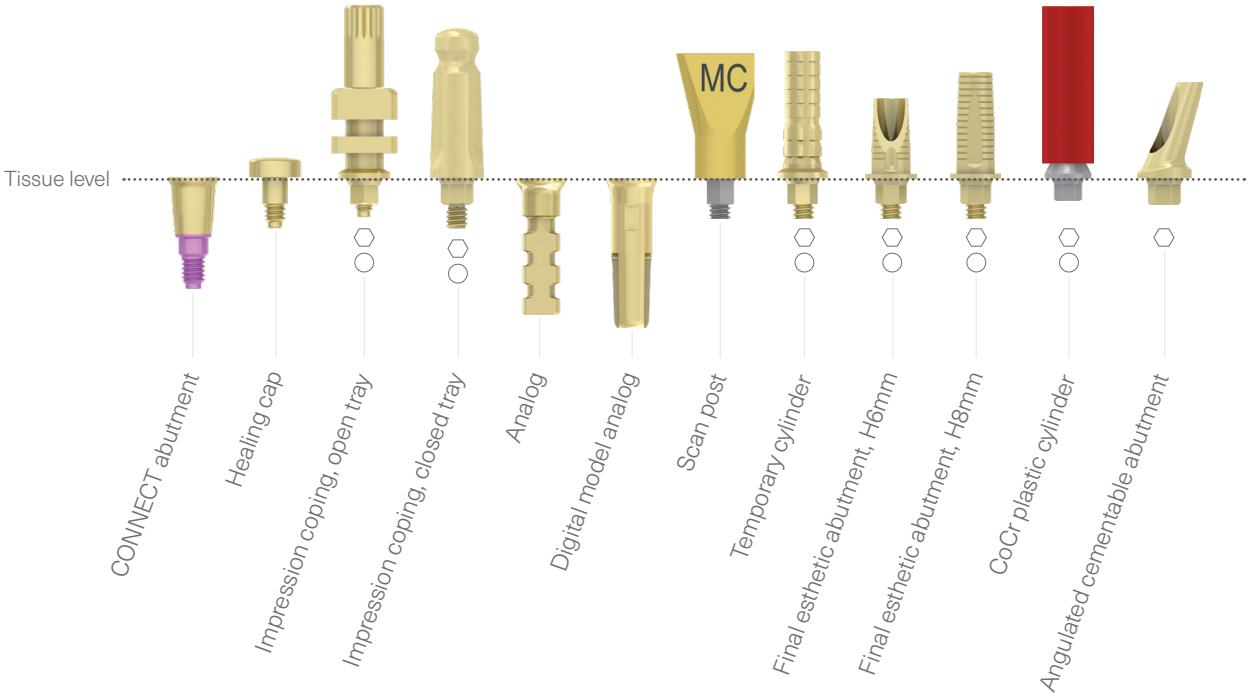
The CONNECT abutment system has several distinct advantages:

1. It transforms the bone-level implant into a tissue-level implant, without the drawbacks (lack of prosthetic flexibility).
2. It distances the prosthetic platform from the bone, which leads to reduced bone remodeling.
3. It's a one-time abutment.
4. It's a solid abutment – no screw chimney with unavoidable contamination.
5. It has a narrow profile of Ø4mm (and an additional wider Ø5.7mm profile for posterior sites).
6. It's integrated into a simple, traditional or digital prosthetic workflow.
7. In case of significant tissue alteration, a new suitable CONNECT may be replaced to the desired height.
8. It offers flexibility in choosing the appropriate height according to the thickness of the mucosa.
9. It guarantees placement of clean and sterile components which come in contact with the mucosa.

CONNECT System

⬡ Anti-rotation

◯ Free-rotation



The CONNECT system's "natural" indication is for multi-unit screw-retained restorations. However, the steep, tight conical connection allows it to be used in single unit situations as well, in spite of its non-engaging interface with the implant platform.

When torqued to 30 Ncm, the connection does not loosen over time, but rather gets tighter with use. It is successfully used by many in this way.

More Info

(See the CONNECT Leaflet for recommended prosthetic protocols using the CONNECT system).

Pro tips for using the conical connection

1. Check your mucosal height

For best results, place implant at least 3mm below the gingival margin. If mucosal height is less than 3mm, sub-crestal placement is not a problem.

2. Go with screw-retained

Select screw-retained solutions whenever possible, following the appropriate protocols. Screw-retained restorations ensure residue-free connection to implants as well as controlled retention and retrievebility.

3. Clean up the mess!

If you use a cement-retained solution, make sure to remove all excess cement from the sulcus. Retained cement can cause infection, tissue damage and eventual failure of implants. Abutments with 0.5mm sub-gingival crown margins and the use of barriers such as retraction cords, allow easy removal of all cement remnants.

4. Play it safe with CONNECT or Multi-Unit abutments

For multiple unit situations use Multi-Unit Abutments or CONNECT abutments. The conical connection doesn't allow for a truly passive fit of multiple units at the implant level. Therefore screw-retained multi-implant bridges should not be attempted at implant level - use only Multi Unit or CONNECT abutments.

5. One-time abutment and forget it

CONNECT is an ideal system for implementing the "One Abutment, One Time" concept (for single or multiple units). The protocol is even more crucial when implants are placed sub-crestally. As such, it is better to place the abutment during surgery.

6. Tighten it right

Always tighten the abutment to the recommended torque, before starting the prosthetic workflow to ensure that everything is set to the correct depth and index.

7. X-Ray the critical steps

Always take an x-ray during the impression taking stage (impression post or scan body). This will assist in selecting the correct height of the abutment, making sure it will not hit the proximal bone. It is also advisable to take an x-ray after insertion of the abutment to confirm definitive seating and clearance from bone.

8. Original is best!

Use original components to ensure complete component accuracy and fit. This guarantees a completely sealed and flawless connection.

9. Make sure it's sterile!

Components connected to the implant head should be sterile or well cleaned and sterilized in order to have maximal attachment of the epithelial cells. The following components are delivered sterile: CONNECT, Multi Units, Healing Caps.

10. Your first choice

Conical implants should be the first choice for single tooth replacement, especially when replacing molars, but also premolars. This should definitely be the case when planning cemented crowns. Due to the improved friction between the implant and the abutment, there is almost no danger of abutment screw loosening.