FREE EBOOK EDITION

17 Immutable Laws in Implant Dentistry

An Introduction to Implant dentistry

By Francisco T. Barbosa & Daniel Robles

Periospot

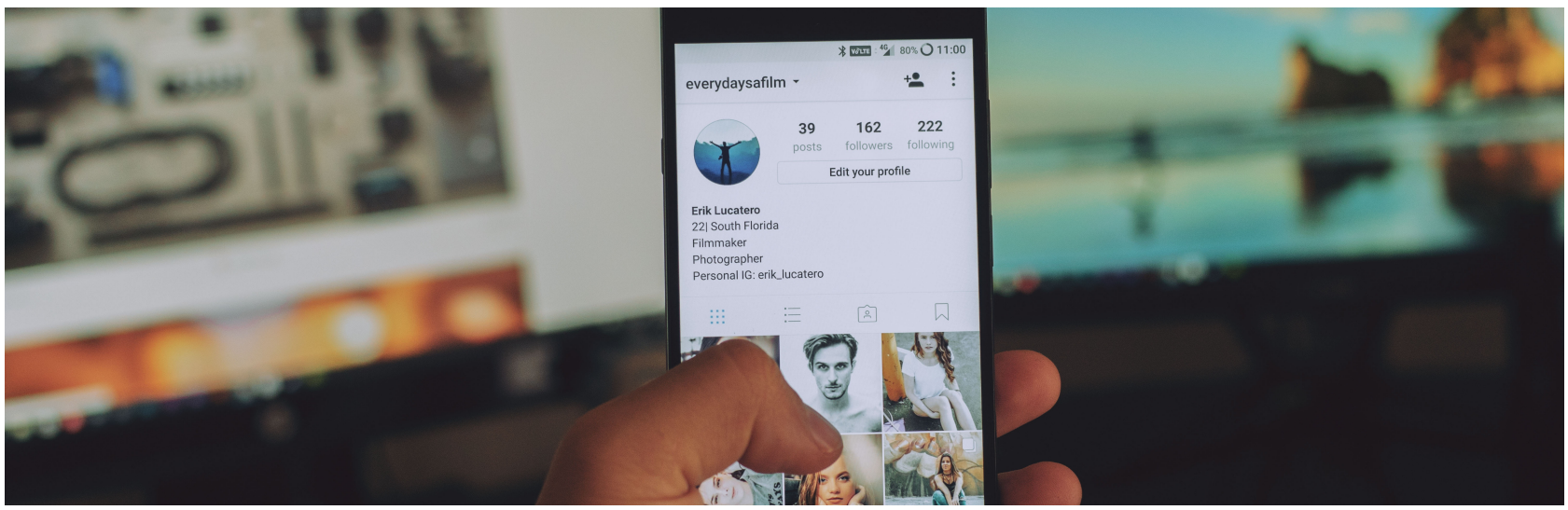
A SHORT UPDATE

As soon as I observed that the article "10 tips about aesthetic implantology" was the most shared and visited on my webpage some years ago (2014), I realized that I should upgrade this piece of content into a more user-friendly format.

So in 2016, I launched the ebook "10 tips about aesthetic implantology."
I have to say I didn't expect the success after the launching and in just a few months it was already downloaded more than 700 times since 2016.

It was a simple guide describing ten factors that every dentist should consider when performing a case involving implants in the aesthetic zone.

The goal was to create something useful and evergreen, but everything evolves, and people don´t watch tv anymore, they get engaged with Netflix instead. People don't use their phones to make phone calls or send text messages. They use it to browse facebook and to swipe matches on Tinder.



Implant Dentistry is not an exception, and that's why it is essential to update some concepts although there must be some rules that remain immutable even though science keeps throwing more and more data that sometimes creates more confusion to the clinicians instead of helping them improve their protocols in their daily practice.

That's why, Daniel and my self, we decided to create a guide with concepts that we expect that in the next 10 years they will keep being um(mutable).

Its a simple piece of content, but adapted to the new times; the era of the 270 characters on twitter and one-minute length video.

Enjoy it!

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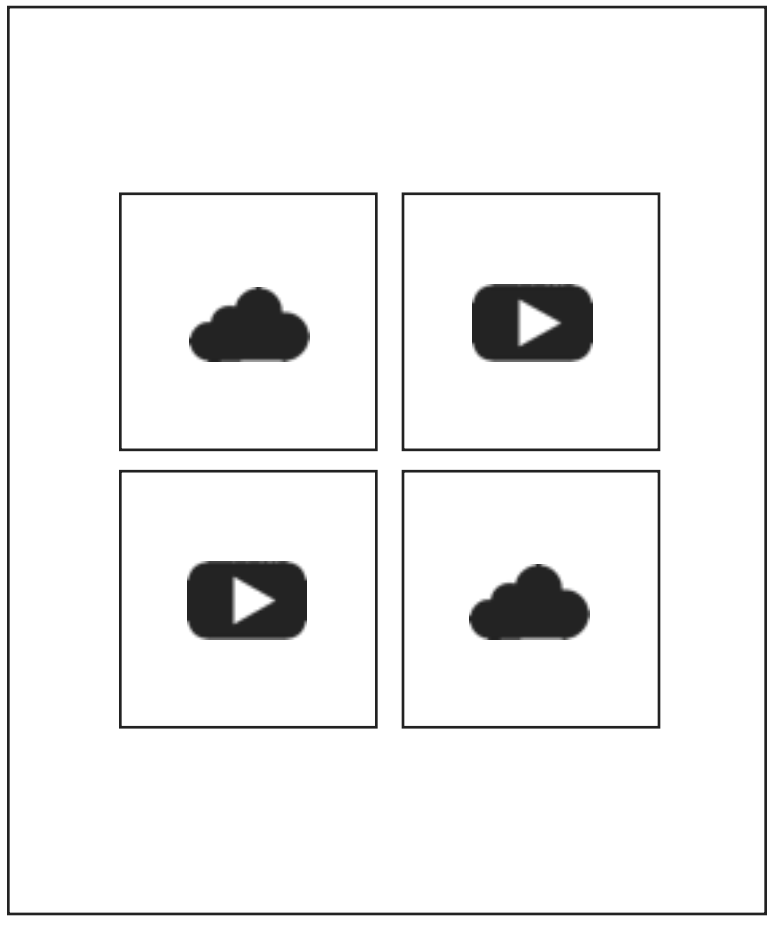


ABOUT THIS EBOOK

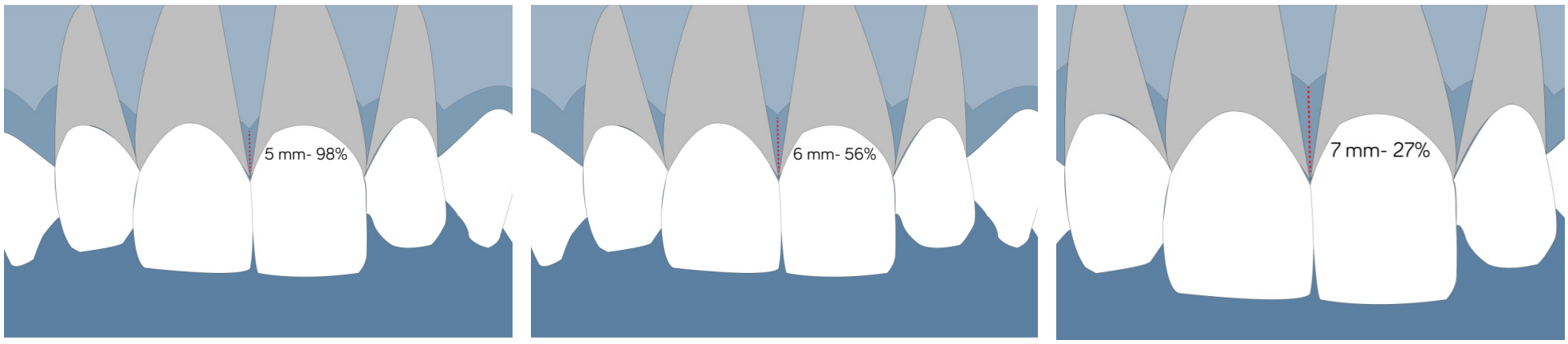
This ebook is an **interactive ebook**, so any word that is underlined has a link to a video, animation or other content of interest.

Also, some social follow icons are present in case you want to follow some of the contributors to this ebook.

FIRST LAW:PRESENCE OF PAPILLA

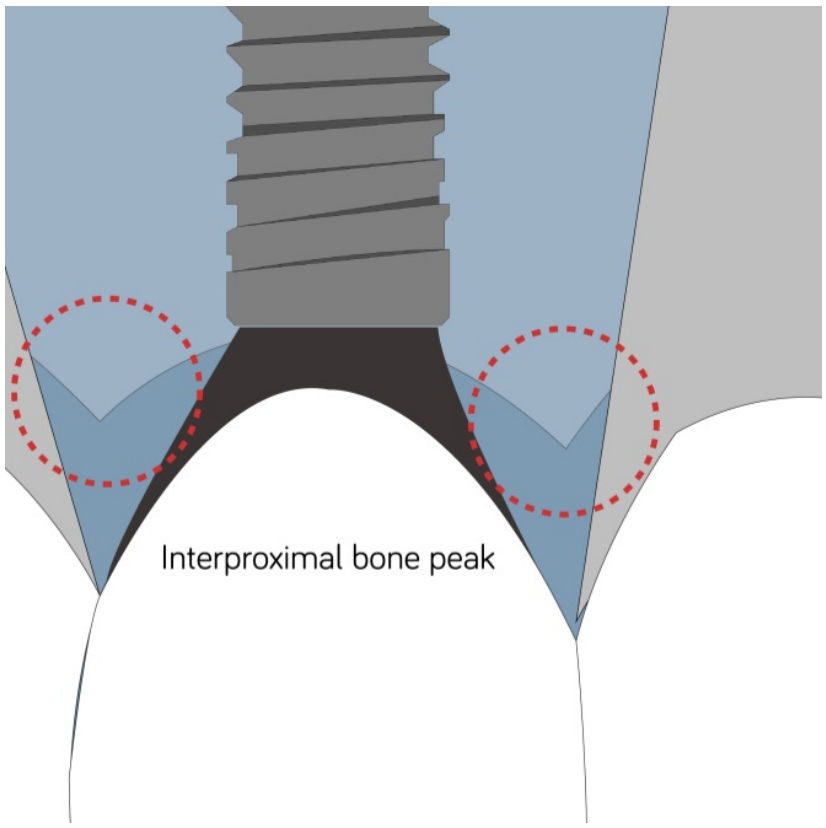
Presence of papilla between an implant and a teeth depends mainly on the presence of interproximal bone of the adjacent teeth. If there is a bone defect, there will not be papilla (Kan 2003). There is also a relation between the presence of the papilla and the distance between the contact point and the bone crest (Tarnow 1992), where there will be a probability of complete existence if this distance is 5mm or less (98%), and less likelihood if that distance is 6 mm (56%) and 7 mm (27%).

Although the trial performed by Tarnow was conducted in natural teeth, Salama (Salama 1998) and coworkers found that 4,5 mm of papilla was the average amount of papilla that we should expect to have between an implant and teeth if a distance of at least 1,5 mm was maintained between an implant and a teeth.



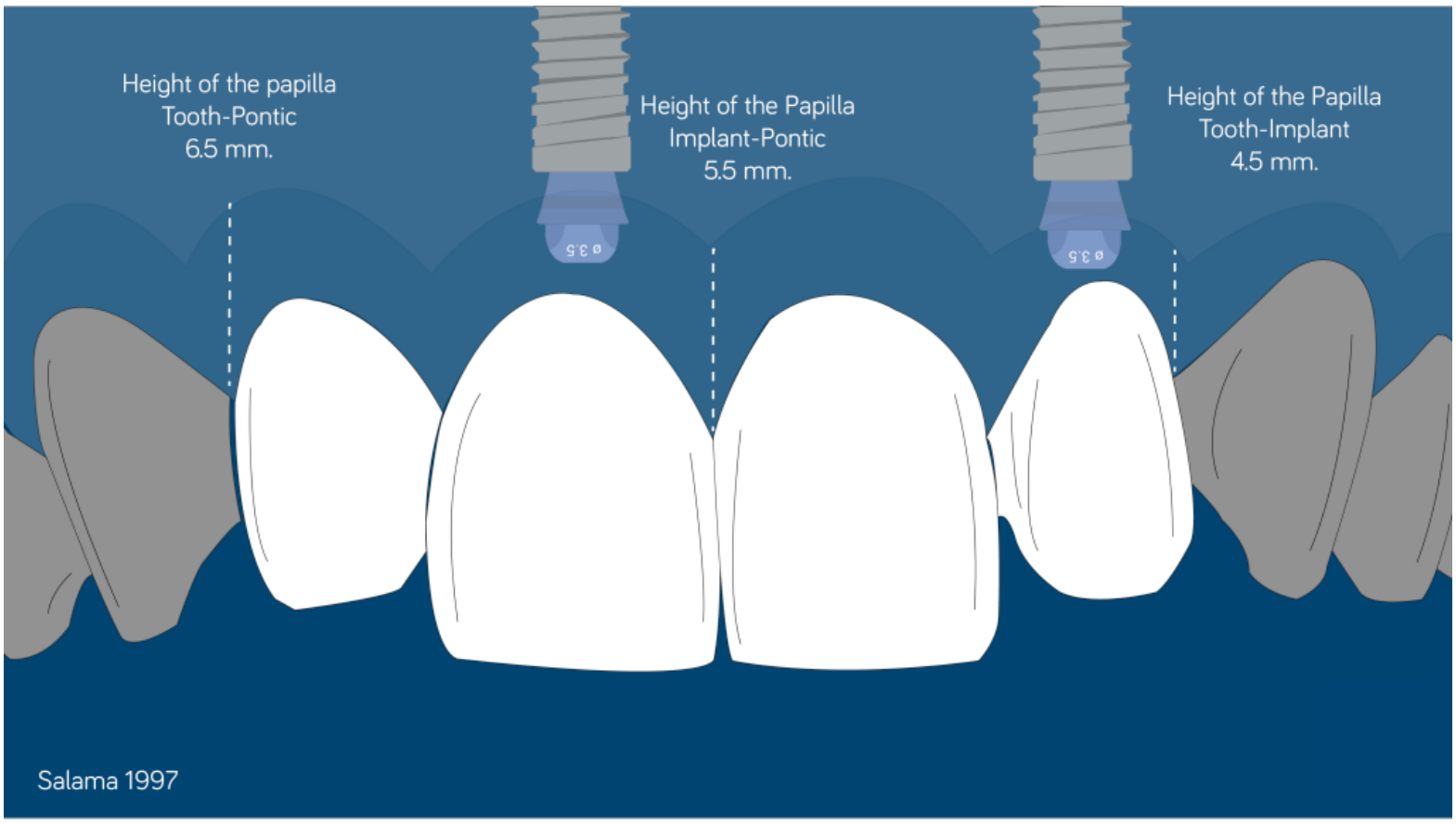
DISTANCE TO THE CONTACT POINT

Different distance from the contact point to the bone crest will represent different soft tissue contour. The more distance between the contact point and the bone crest, the less likely is the presence of papilla.



PAPILLA AROUND AN IMPLANT RESTORATION

The presence of papilla around an implant is determined by the integrity of the interproximal bone peaks of the adjacent teeth (Kan 2003).



The last part of this chapter is a summary based on the article from Salama in 1998 where the expected height of the papilla is the following:

RESTORATIVE ENVIRONMENT	PROXIMITY LIMITATIONS (MM)	VERTICAL SOFT TISSUE LIMITATIONS (MM)
Tooth-tooth	1	5
Tooth-pontic	N/A	6.5
Pontic-pontic	N/A	6.0
Tooth-Implant	1.5	4.5
Implant-pontic	N/A	5.5
Implant-implant	3	3.5

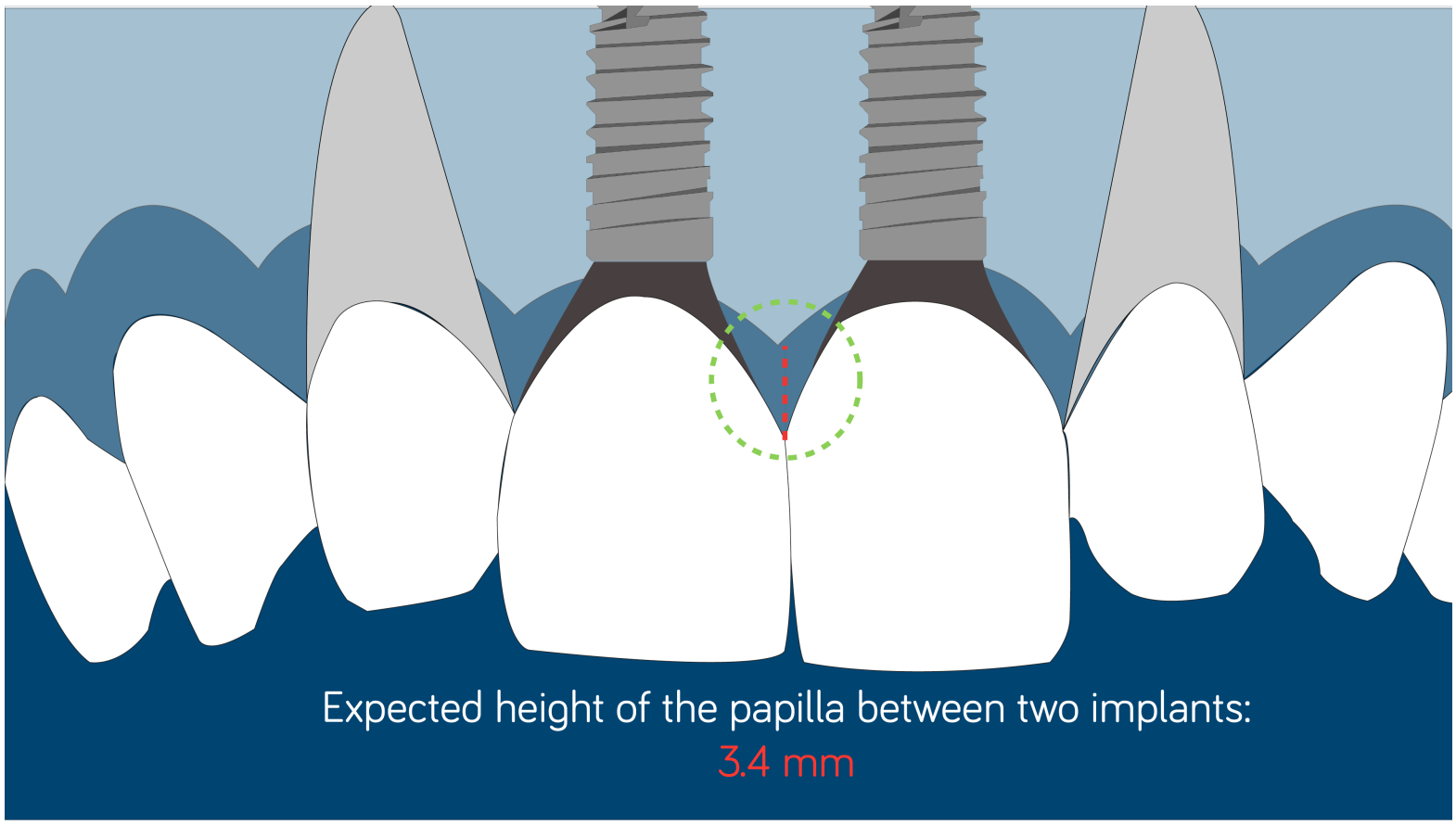
SECOND LAW: PRESENCE OF PAPILLA BETWEEN IMPLANTS

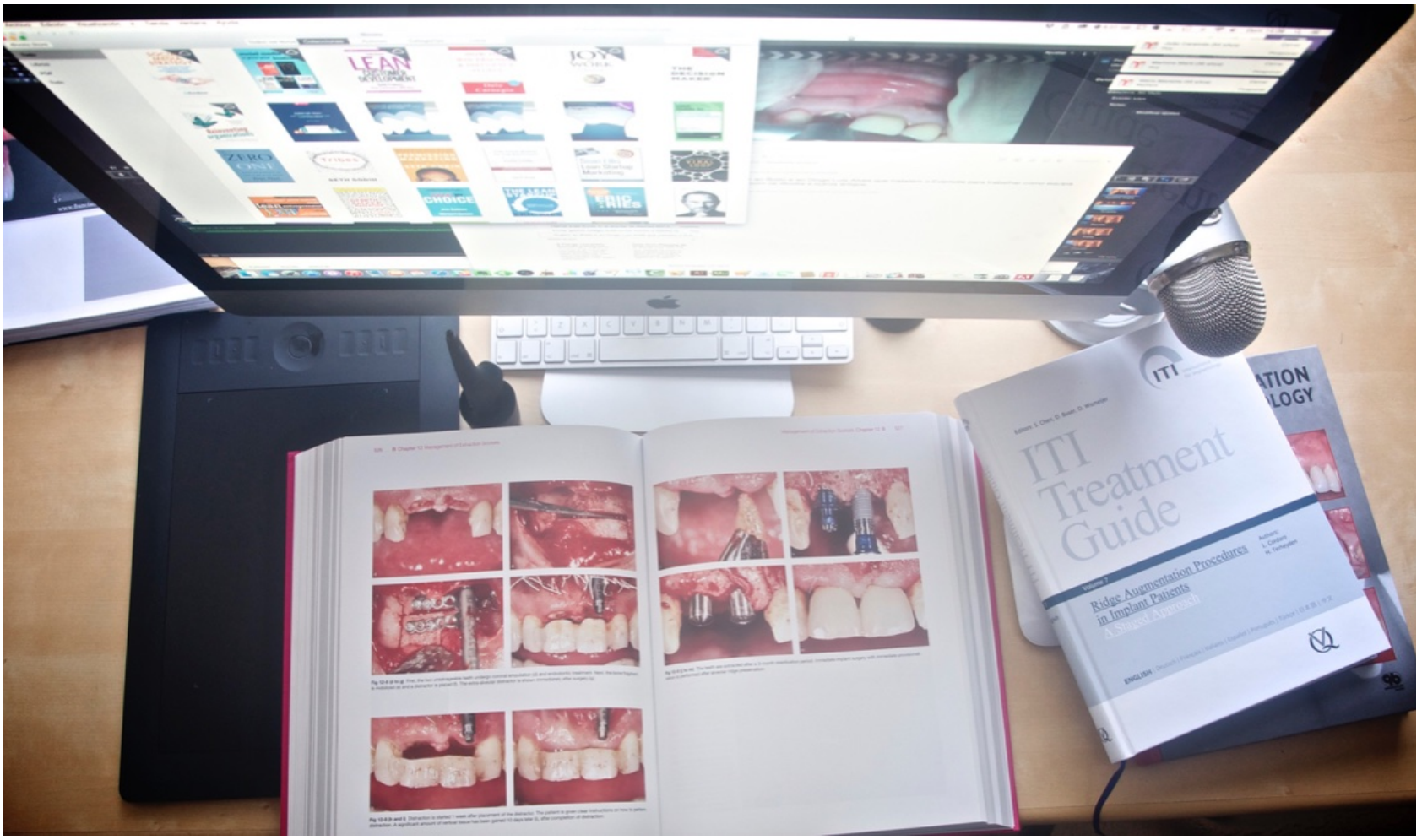
Placing two implants adjacent is always a big challenge. The mean papillary height between to implants will be 3,4 mm, which is in most of the cases insufficient to achieve an optimal aesthetic result (Tarnow 2003). This issue can be solved by placing one implant to substitute two anterior teeth. This way it is expected to achieve a higher papilla level between an implant and a pontic (5,5mm) (Salama 1998).

Although the results from Tarnow´s research showed that the mean height of the papilla between two implants could range from 2-4 mm (3.4 mm average), it is uncertain if this height would be the same if platform switching implants were used.

Less bone resorption is expected around implants with the platform switching concept than in implants with the regular connection.

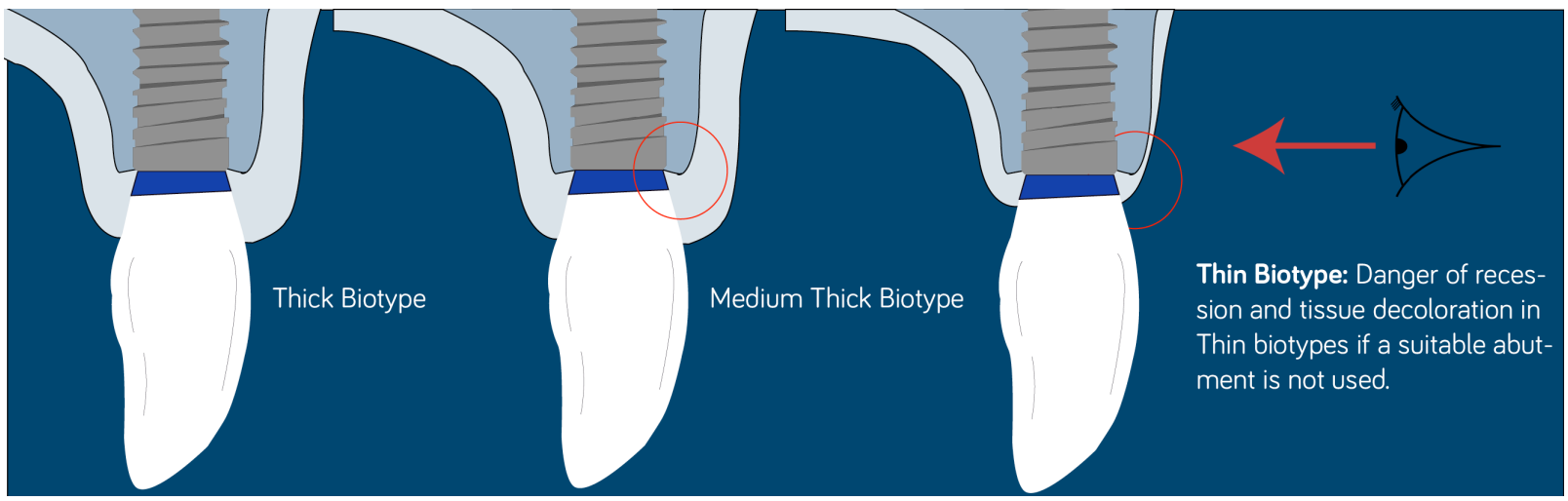
In both vertical and horizontal components, it allows positioning the implants closer than 3 mm (Ciurana 2009).



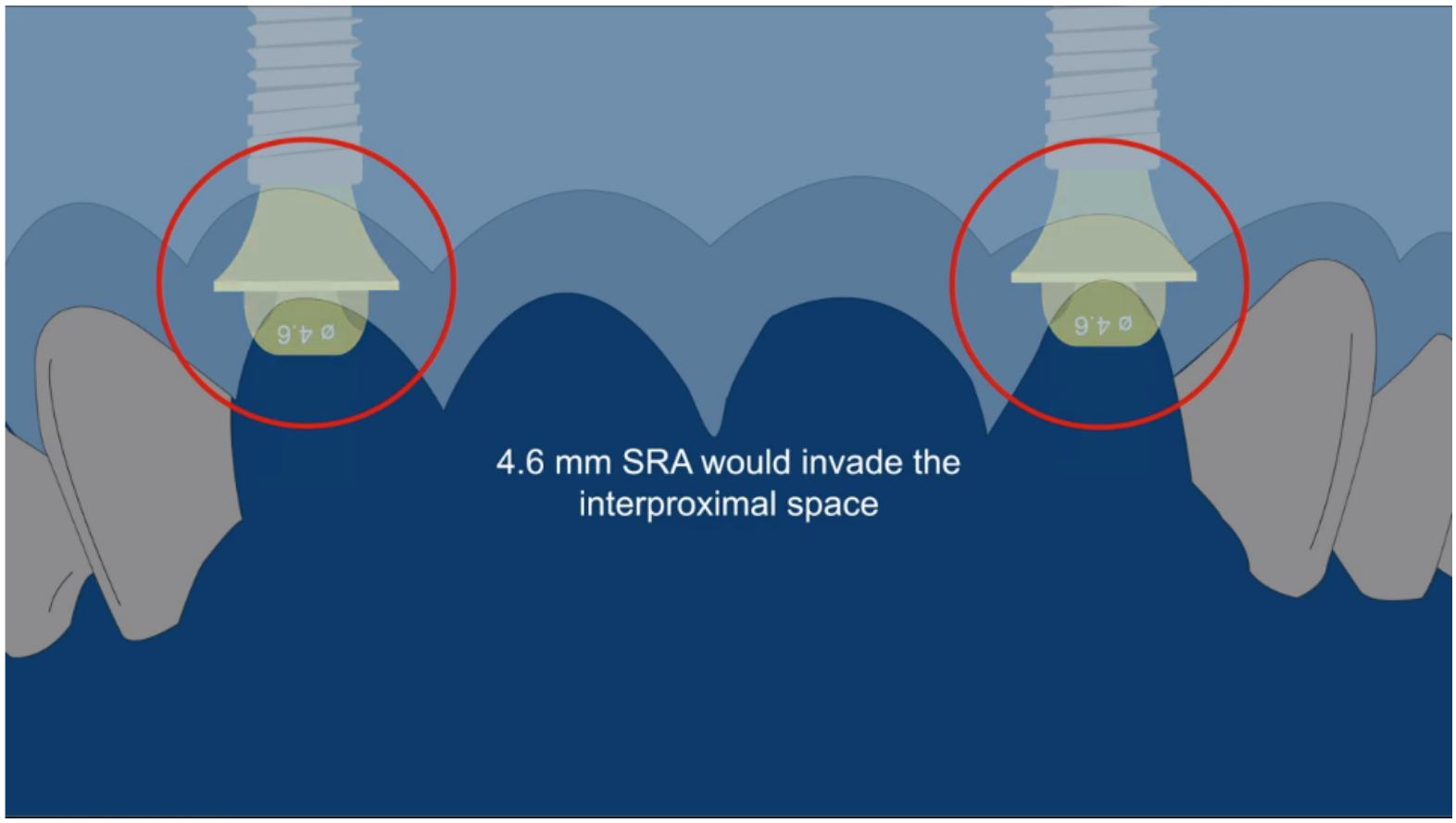


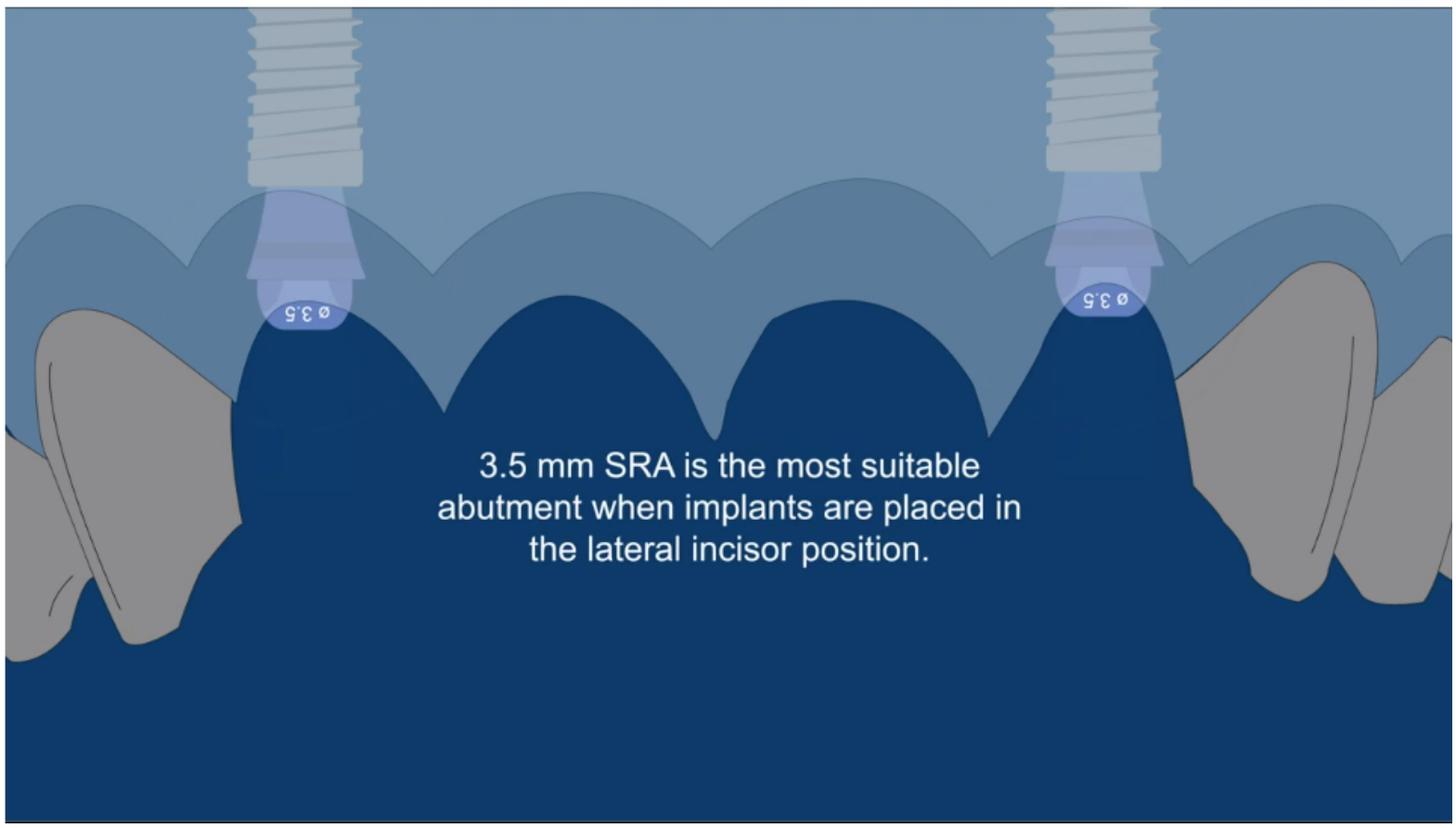
THIRD LAW: SELECTING THE CORRECT ABUTMENT

It is essential to choose the right abutment when an aesthetic restoration is performed. If there is a thin mucosa with less than 2 mm width, zirconia should be the option cause metallic abutments will show a color alteration of the peri-implant soft tissue (Jung 2007,2008).



Using narrow-diameter abutments (3.5 mm) will help avoid the invasion of the interproximal papilla in some cases where a narrow edentulous span is present.





Click on the icon below or in the picture on the left to read more about correct abutment selection in the aesthetic zone.

The abutments should mimic the topography and chemistry of natural teeth. If this similarity is achieved, an attachment between the abutment and the transmucosal soft tissue is achieved, there will be an improvement on the functional and the aesthetic result.

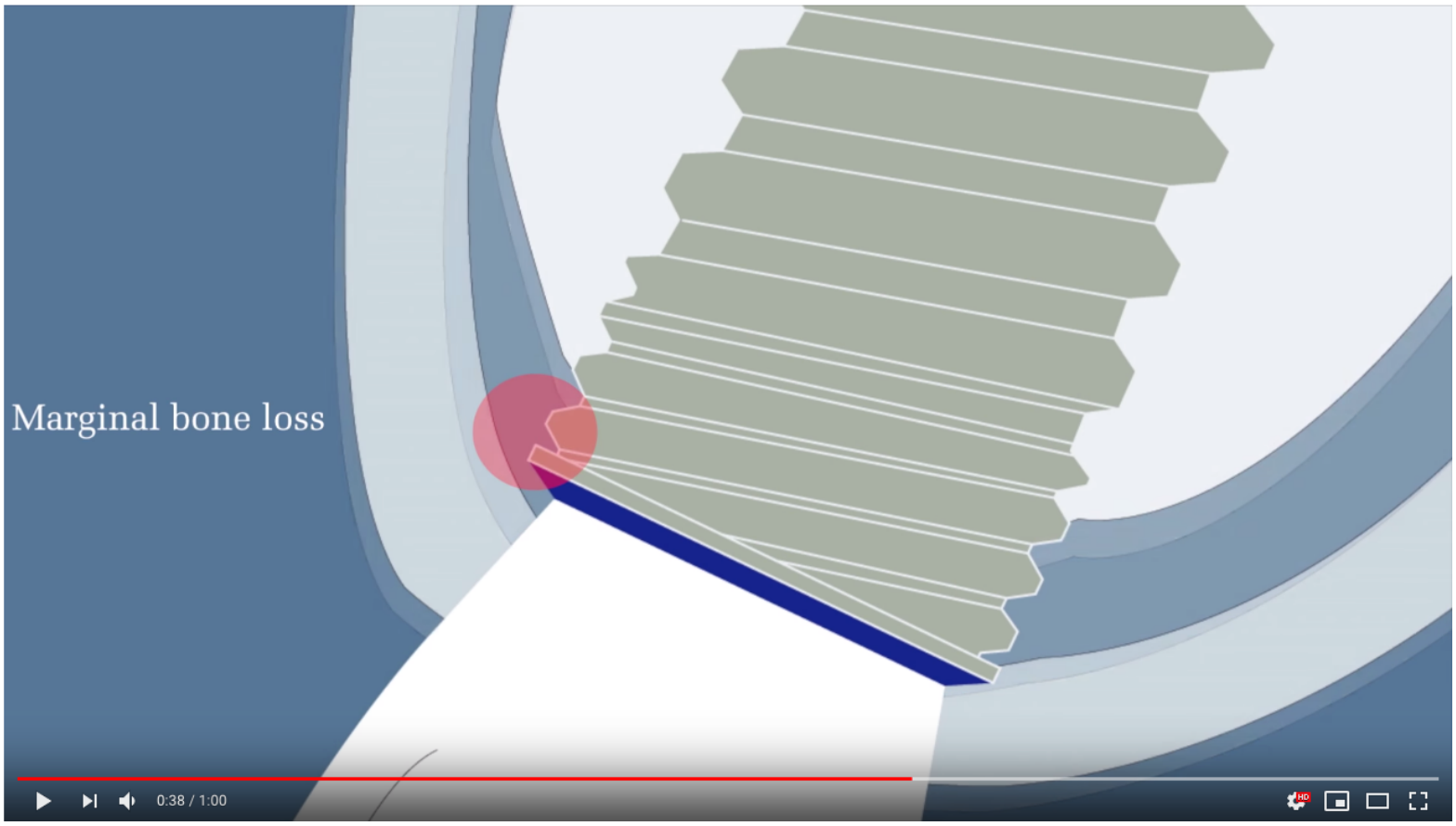
There is a recommended roughness that the abutment should have, and this roughness should not be above a threshold of 0,4 µm.

A superior roughness would increase the affinity of microorganisms and the risk of peri-implant disease (Al Rezk 2017).

Also, perpendicular collagen fiber organization
against the transmucosal interface can be achieved on hydrophilic surfaces (Schwarz 2013).

Last but not least, the disconnection and reconnection of the implant prosthetic abutment may lead to an apical migration of the biological width promoting soft tissue recession (Abrahamsson 1997).

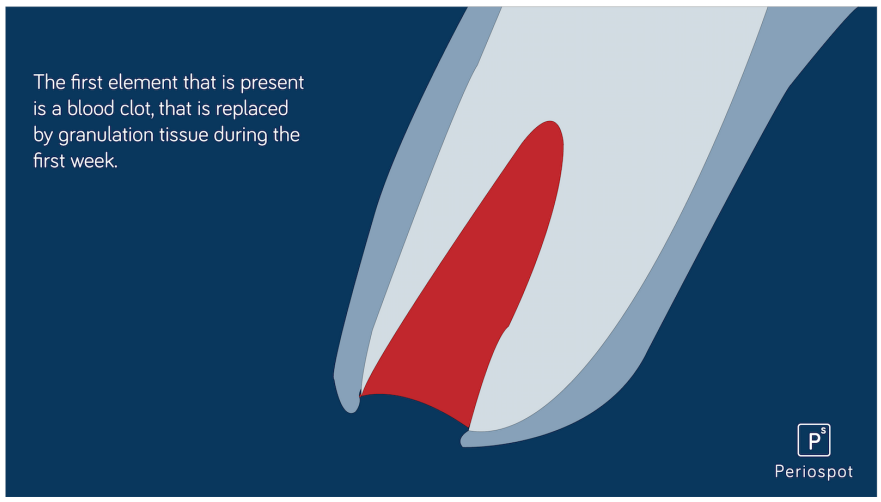
You can watch the video about the impact of using an intermediate abutment clicking in the image below.

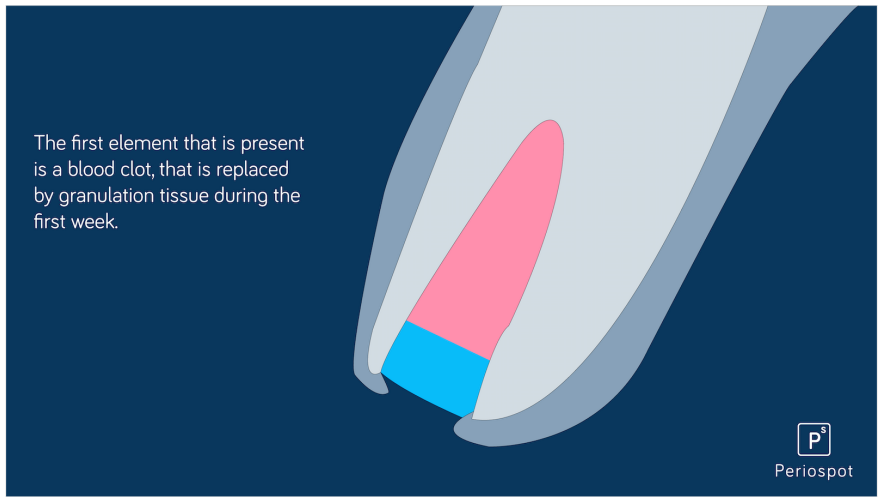


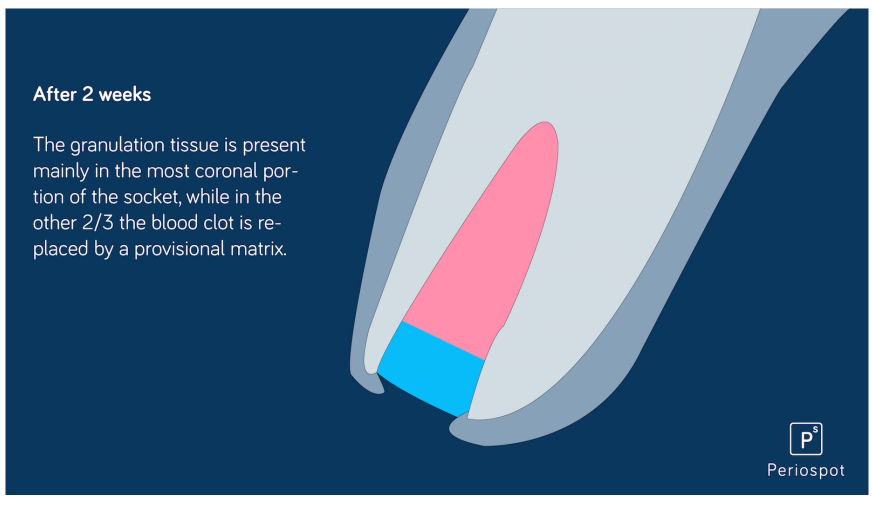
FOURTH LAW: IMMEDIATE IMPLANTS IN THE AESTHETIC ZONE

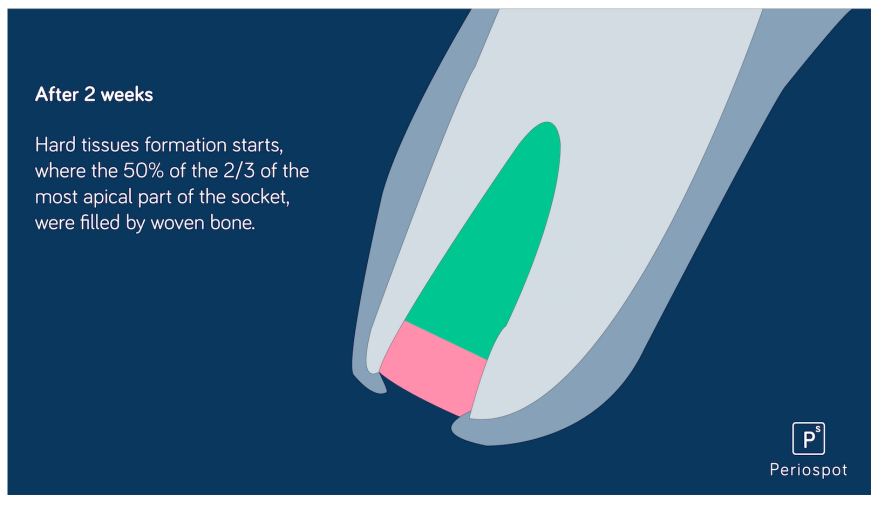
Although this is a very discussed topic, there is some basic knowledge about immediate implants in the aesthetic zone.

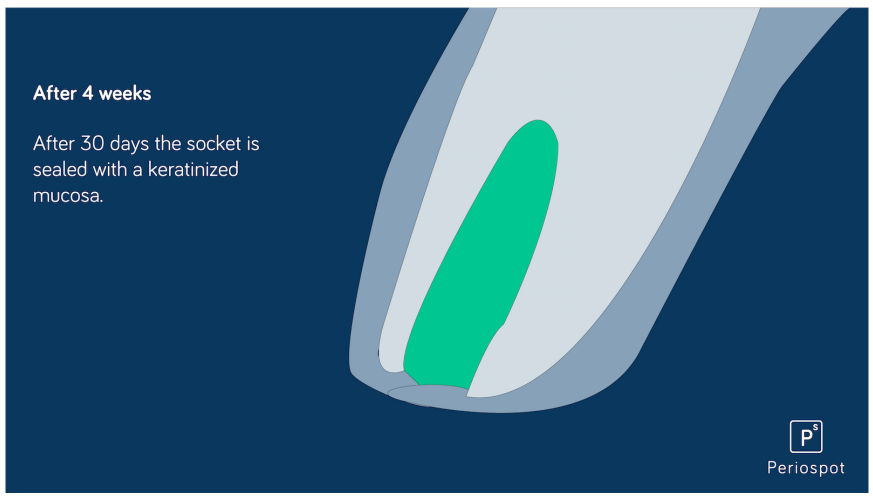
Unavoidable bone resorption happens when a tooth is extracted (Cardaropoli 2003, Schropp 2003, Araujo & Lindhe 2005) and these events are not avoidable if the implant is placed at the time of the extraction (Botticelli 2004, Araujo & Lindhe 2006).

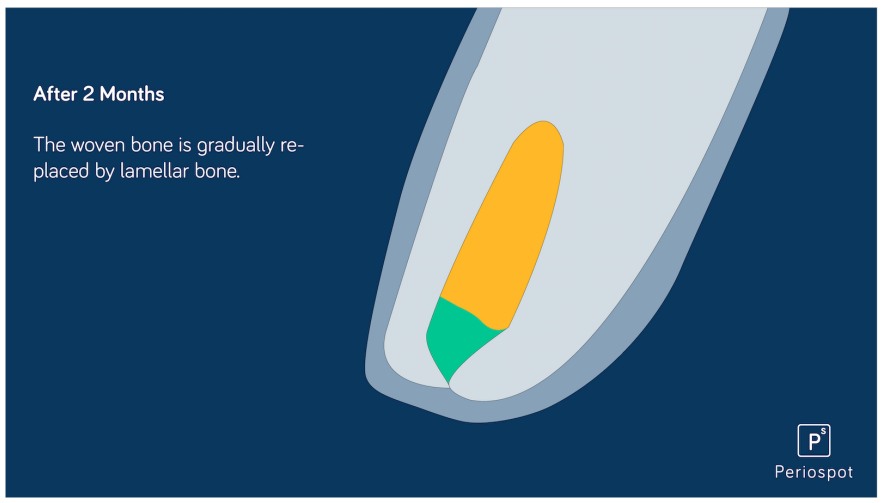












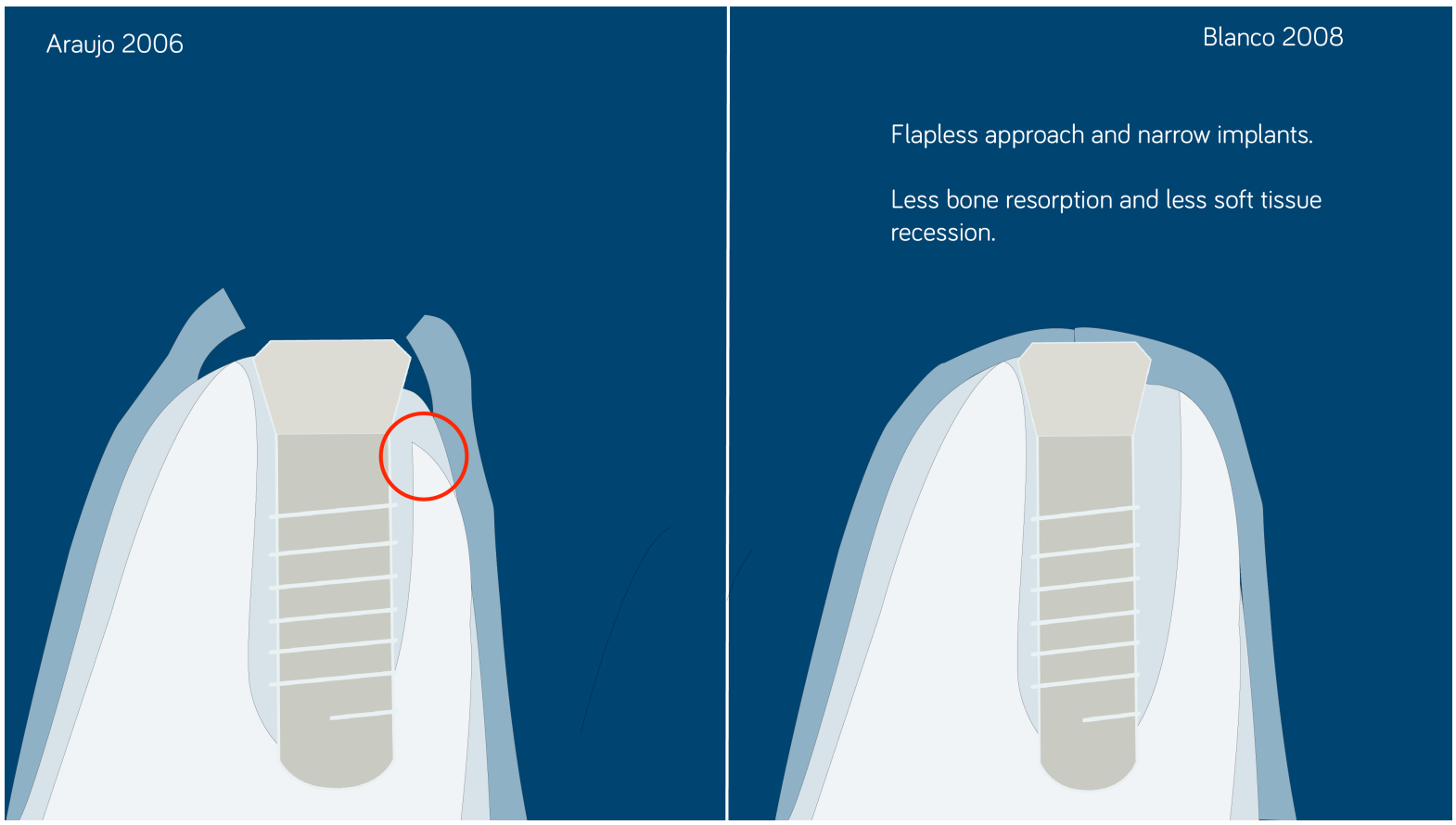
The dynamic events that take place after an extraction are well explained in this illustrations based on the article from Cardaropoli 2003. Click any of the images to access to the animations.

Click on the icon below or in the picture on the left to read more about Immediate implants in the aesthetic zone.

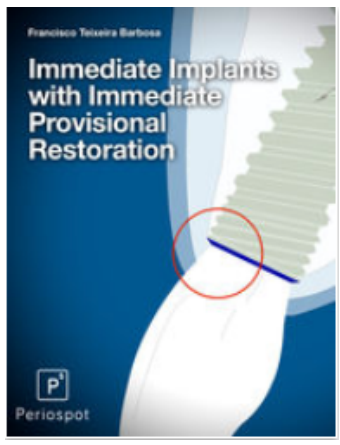
There are some protocols published to overcorrect these events, like performing a connective tissue graft at the time of the immediate implant (Kan 2000, Kan 2005), but the recession of the gingival margin is likely to occur (Evans 2007).

This facial recession will be more pronounced on a thin biotype rather than a thick biotype (Kan 2011), so there could be stated that immediate implants in a thin biotype is not a predictable treatment and other treatment options should be considered, like ridge preservation (Jung 2012).

Nevertheless, wide implants should be avoided leaving a gap between the implant and the buccal bone wall. In this article about scientific publications that we should read with caution, we analyze the importance of using narrow implants and a flapless approach when immediate implants are performed (Araujo 2006, Blanco 2008).



To learn more about immediate implants we recommend also this article about some tips in immediate implants in the aesthetic zone and also this iBook about Immediate Implants Immediately Restored.



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FIFTH LAW: PLATFORM SWITCHING. NOT JUST ANOTHER FEATURE.

Nowadays the patient's expectations for implant treatments outcomes increased in the last decade, and maybe what it was accepted a few years ago (2mm of marginal bone loss in the first year), maybe are not in accordance with the esthetic expectations of our patients.

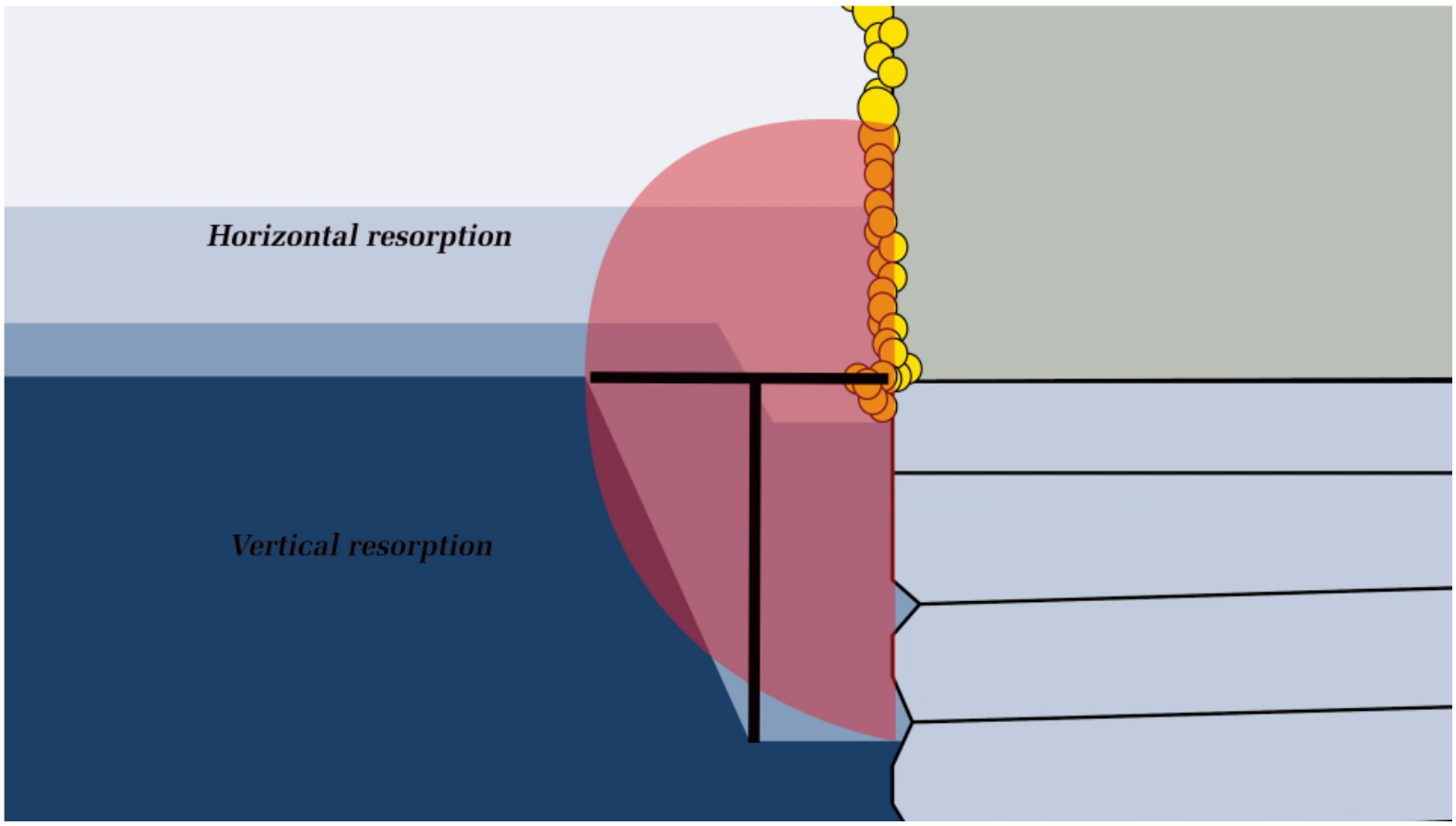
But, why that bone loss happens always when an implant is placed?

PS

Ericsson published that this marginal bone loss is related to the concept of "inflammatory cell infiltrate ICT" of the gap between the fixture and the abutment of the implant.

This gap is filled and contaminated by bacterias which leads to bone resorption.

This article also explains the reason why the biological width is formed around implants, previously described by Berglundh (Berglundh et al. 1991).



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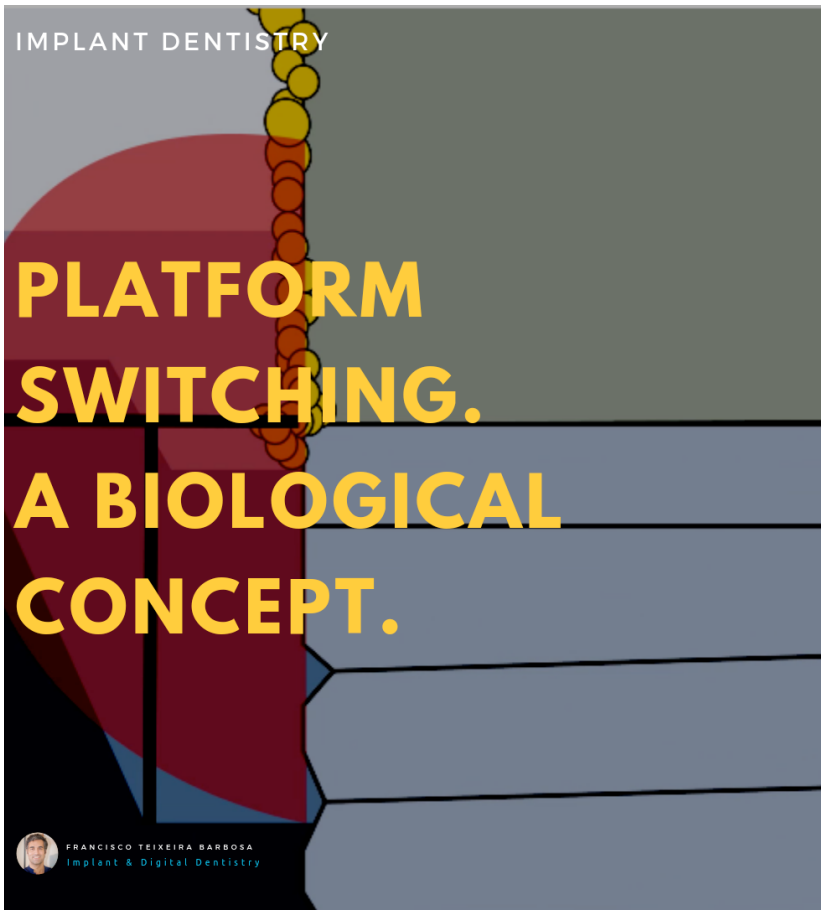


Click on the icon below or in the picture on the left to read more about Platform Switching.

Other reasons for bone remodeling around implants are related to other factors, that where described by Abrahamsson and Hermann in other articles that may help us to predict the bone resorption around implants.

These factors are:

- The thickness of the mucosa (Abrahamsson et al. 1996)
- The type of insertion (crestal, supracrestal or infracrestal) (Hermann et al. 2001)
- The design of the implant (Alomrani et al. 2005).

PS

We could say that platform switching is the implantology Viagra.

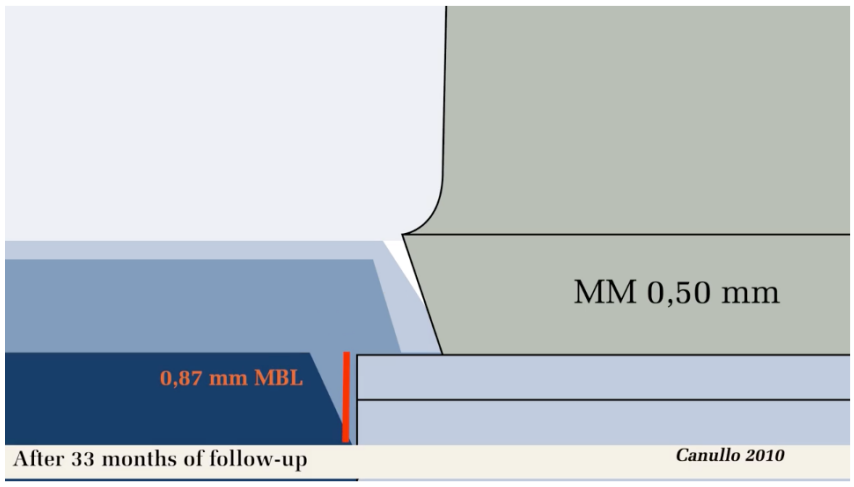
Why?

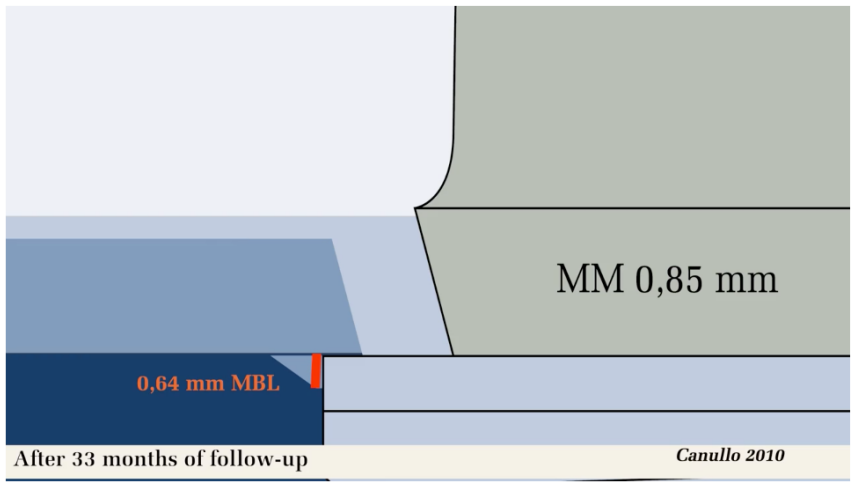
It resulted from a mistake when wide implants became a common treatment option and non-matching abutment where provided to the clinicians.

After these abutments where delivered, during the observationally period, the marginal bone loss was not present in almost every cases (Lazzara & Porter 2006).

Regarding an RCT published by Canullo, the findings are shown in the images below, where it concludes that the marginal bone loss is reduced when the mismatch is larger (Canullo et al. 2010).

You can watch these videos by clicking on the images or visiting this article about platform switching.





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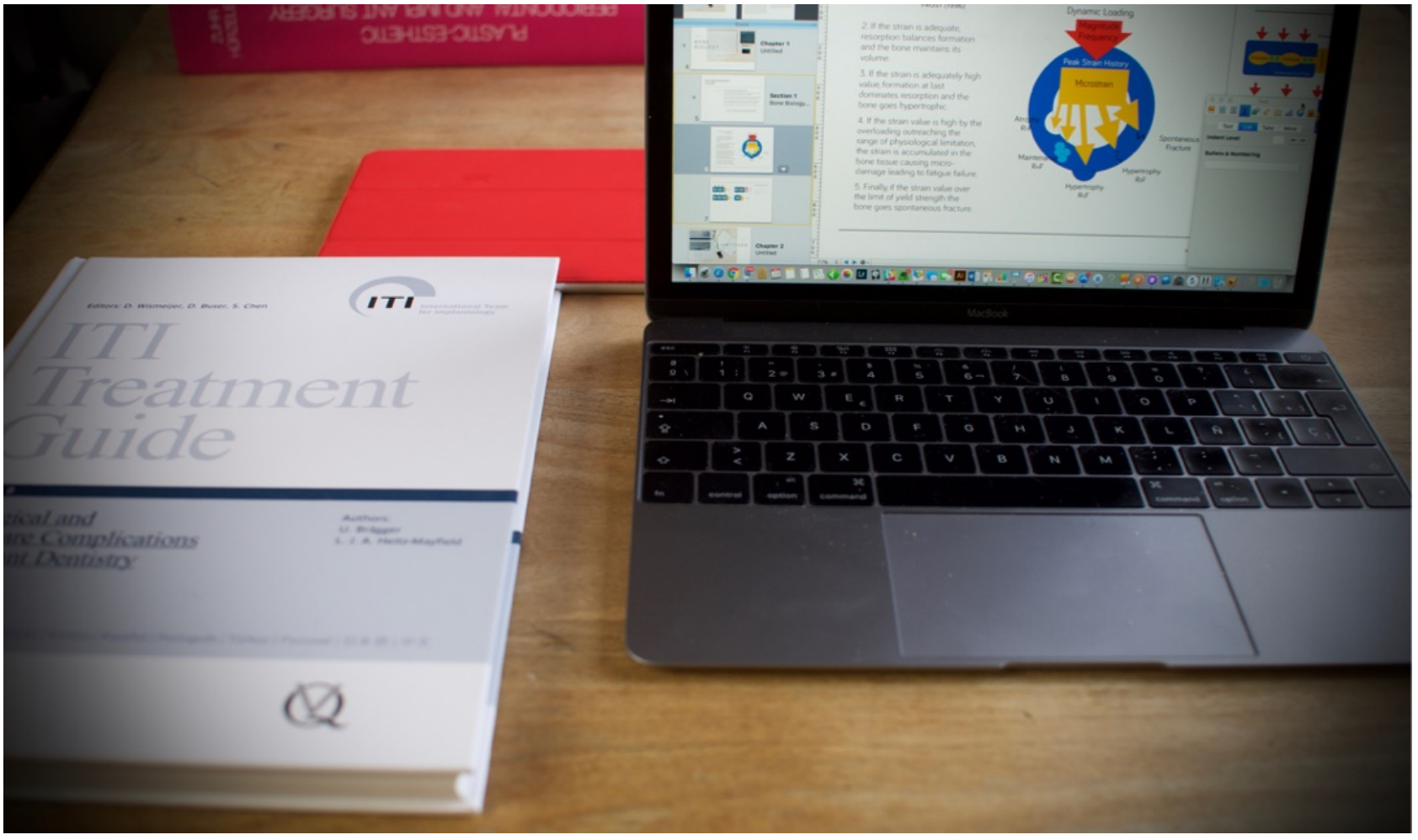
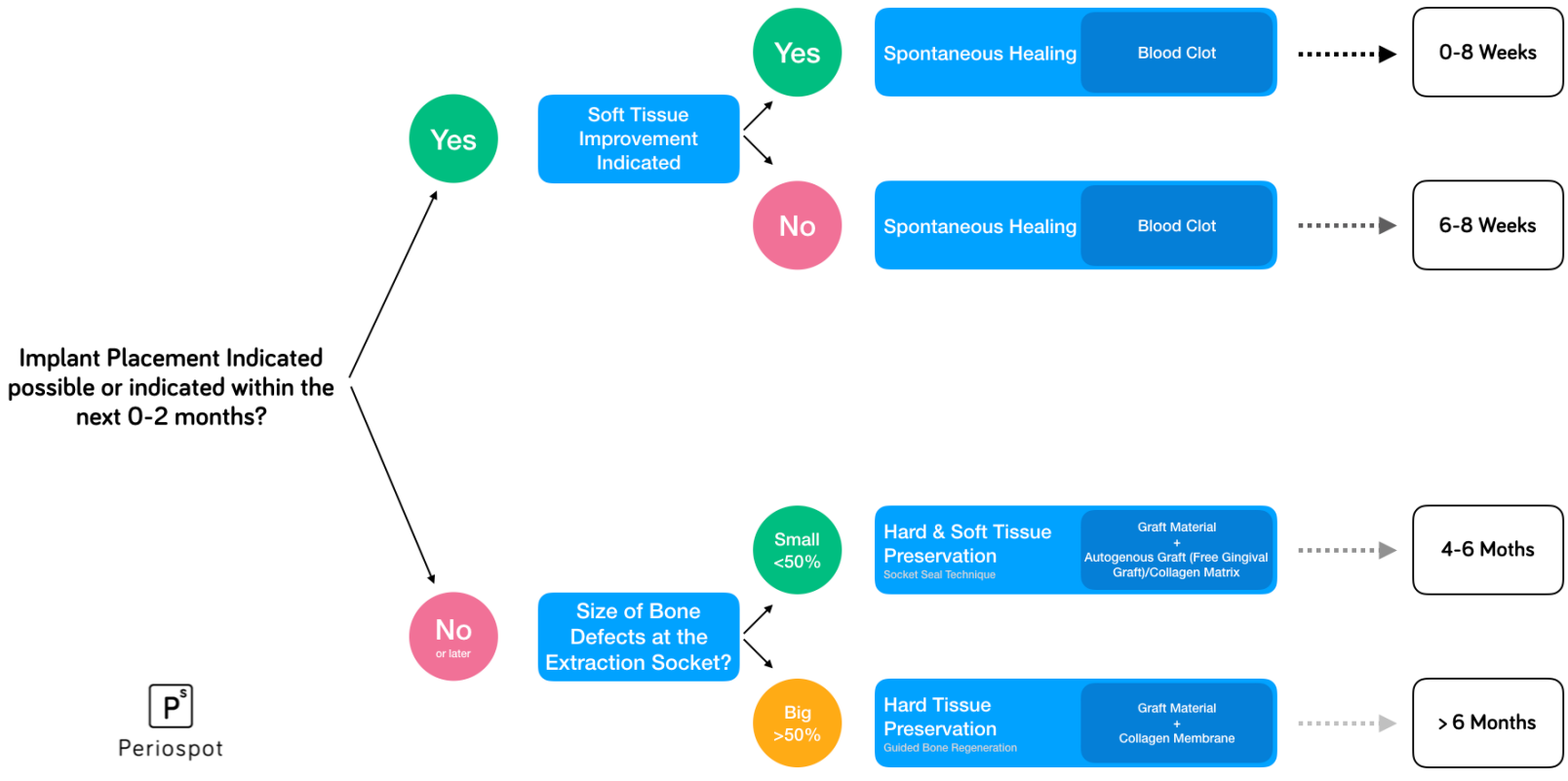


SIXTH LAW: ALVEOLAR RIDGE PRESERVATION- RELIABLE AND PREDICTABLE OPTION.

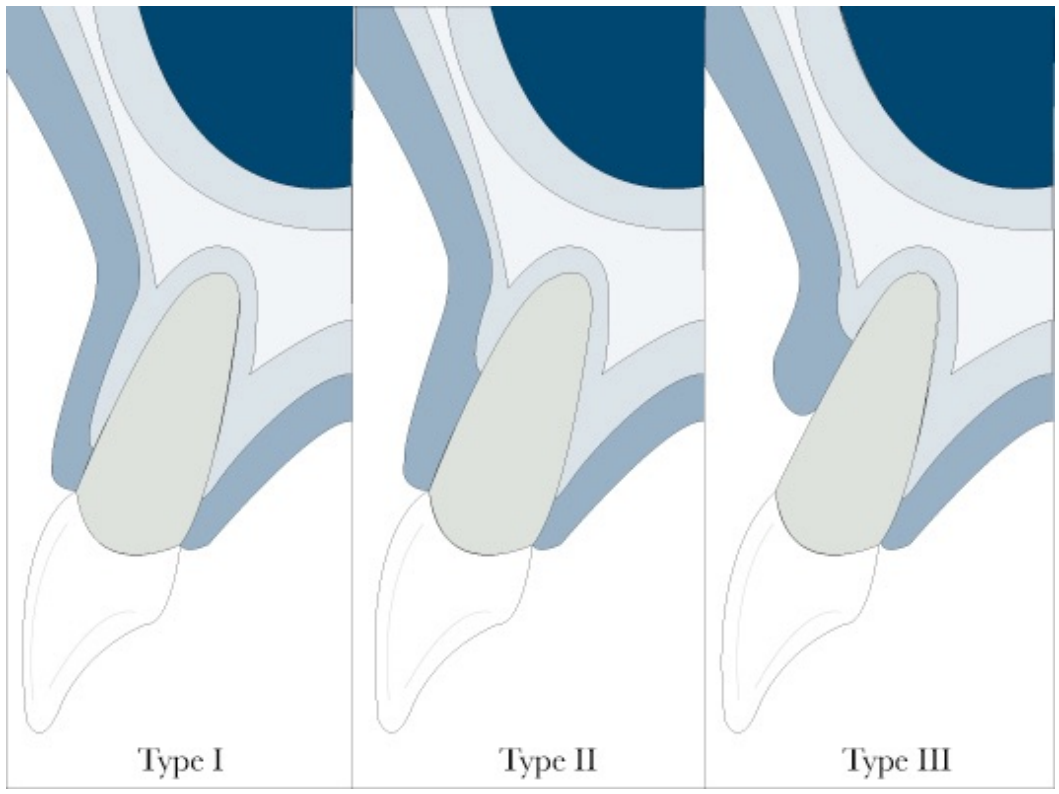
Regarding the decision to perform alveolar ridge preservation we should take a look at the decision tree proposed by Jung (Jung 2018).

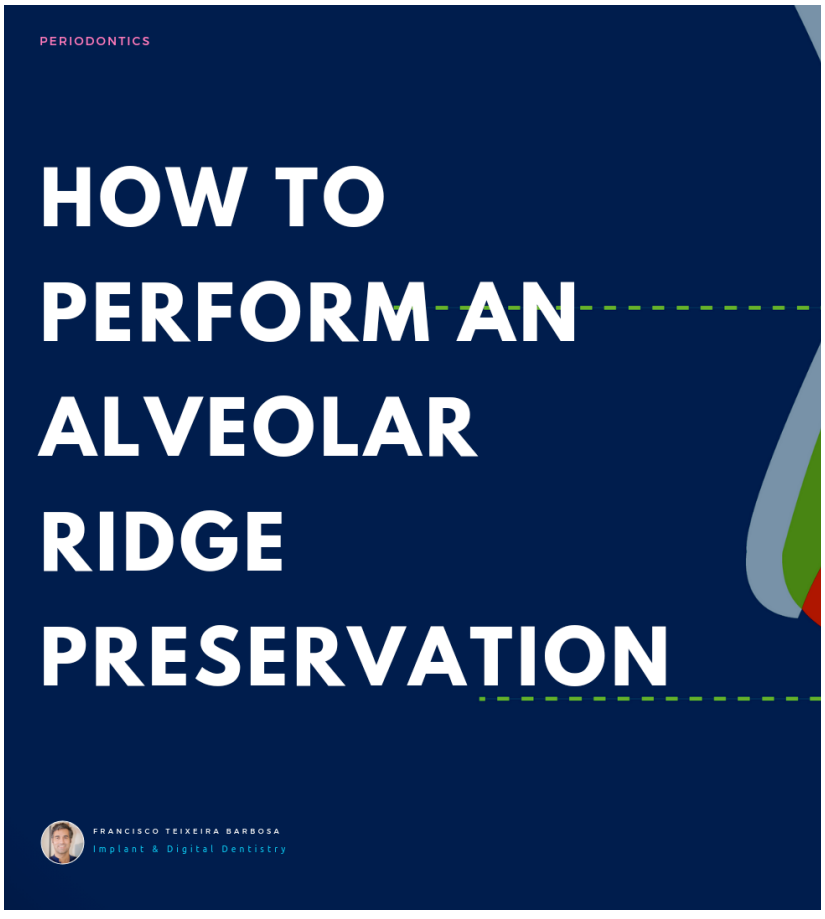
Also, is important to highlight that performing alveolar ridge preservation will always provide better conditions for immediate placement after the healing period (Jung 2004, Jung 2012).



In any case, alveolar ridge preservation should be performed.

It only not makes sense to perform it if a Type III Socket is present (Elian 2007).





Click on the icon below or in the picture on the left to read more about Alveolar Ridge Preservation.

Alveolar ridge preservation can be divided into 3 options:

1. **Soft tissue preservation**

This is indicated if we are thinking of placing the implant in the next two months after extraction.

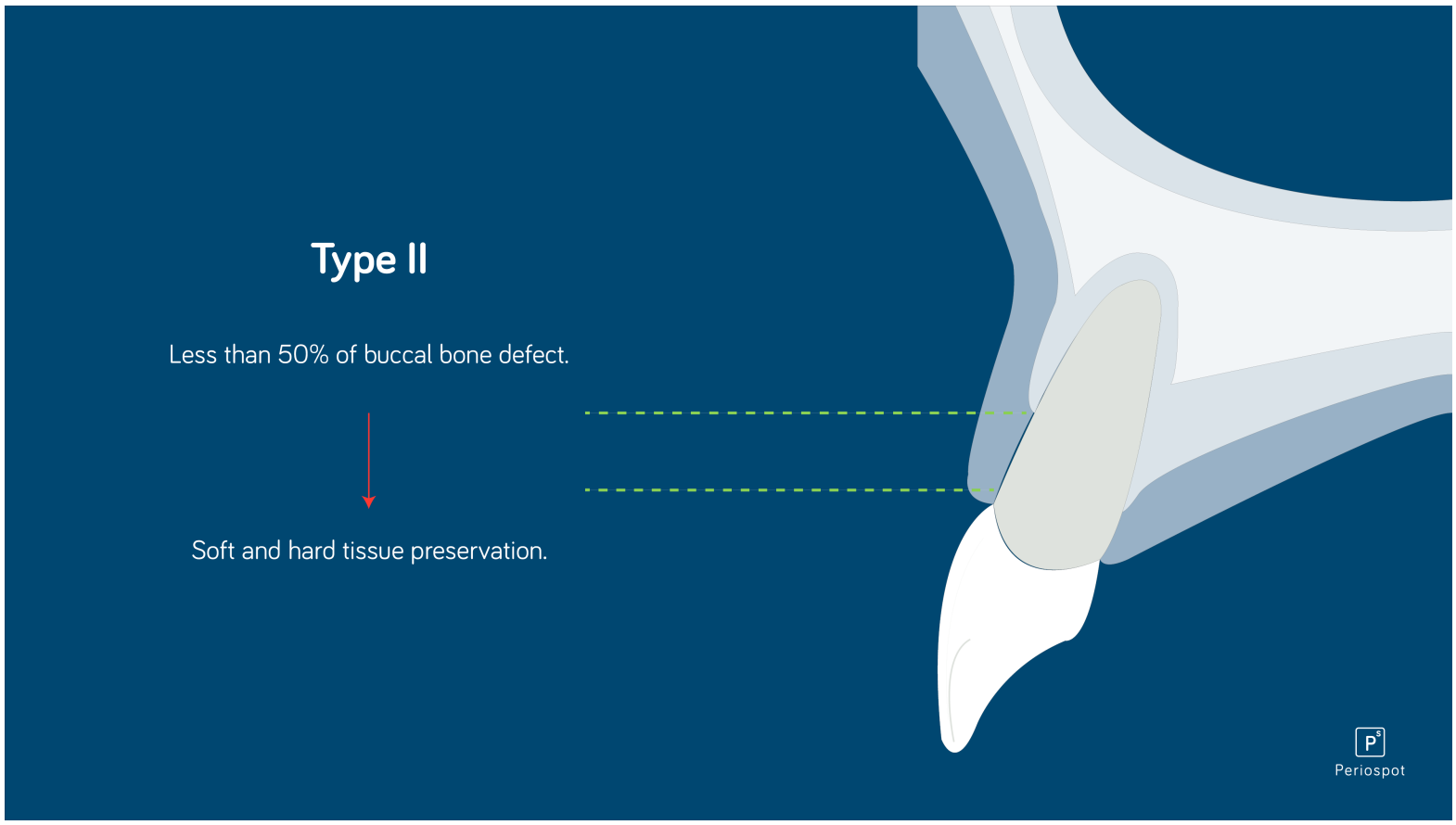
The main reasons to perform this approach is a lack of soft tissue due to a recession.

In these cases, biomaterials are not used as they would delay bone formation.

2. Soft and hard tissue preservation

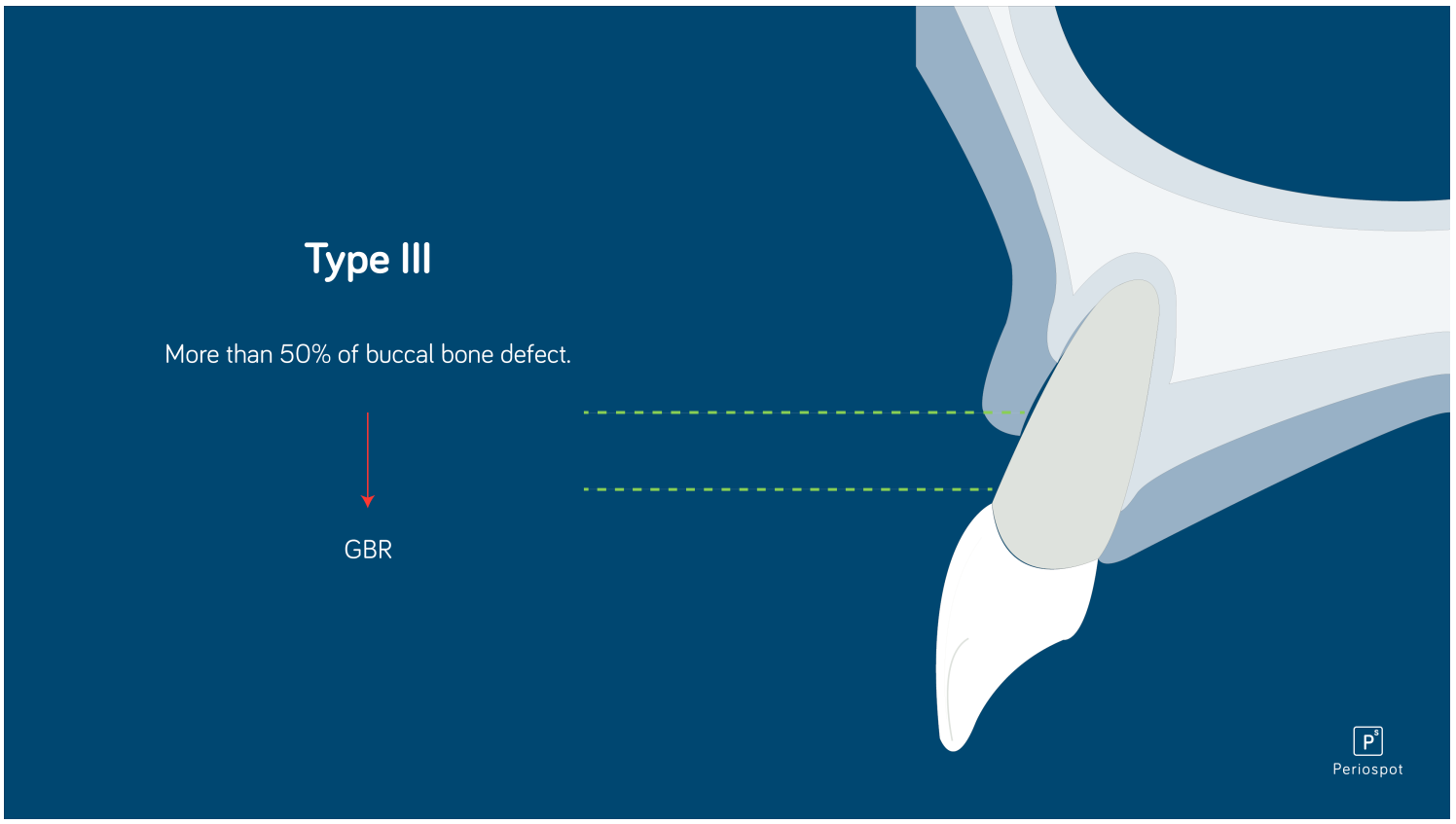
This technique is indicated when the buccal bone defect is less than 50% and when the implant is planned to be placed after 4–6 months.

Using a bone substitute and a soft tissue graft has been proved to be a reliable approach to prevent vertical and horizontal changes after extraction (Jung 2004).



3. Hard Tissue Preservation.

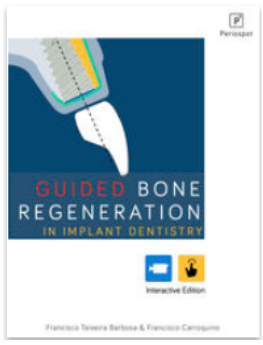
As it was said previously, it makes no sense to preserve a ridge where a defect of the buccal bone wall is larger than 50%.



In such cases, the most effective approach is to perform guided bone regeneration, using a xenograft and a collagen membrane, and finally, a coronal advancement flap to cover the bone regeneration.

In this situation, placing the graft, and not covering it with a coronal advancement flap, has very weak evidence (Vignoletti 2012).

The is more about alveolar ridge preservation in this iBook about Guided Bone Regeneration.



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SEVENTH LAW: USING PROVISIONAL RESTORATIONS IS MANDATORY IN THE AESTHETICS DEMANDING CASES.

After the extraction of the teeth, it is crucial to preserve the papilla architecture. Some authors stated that placing an implant at the same time the teeth are extracted somehow helps to maintain the shape and the papillary architecture.

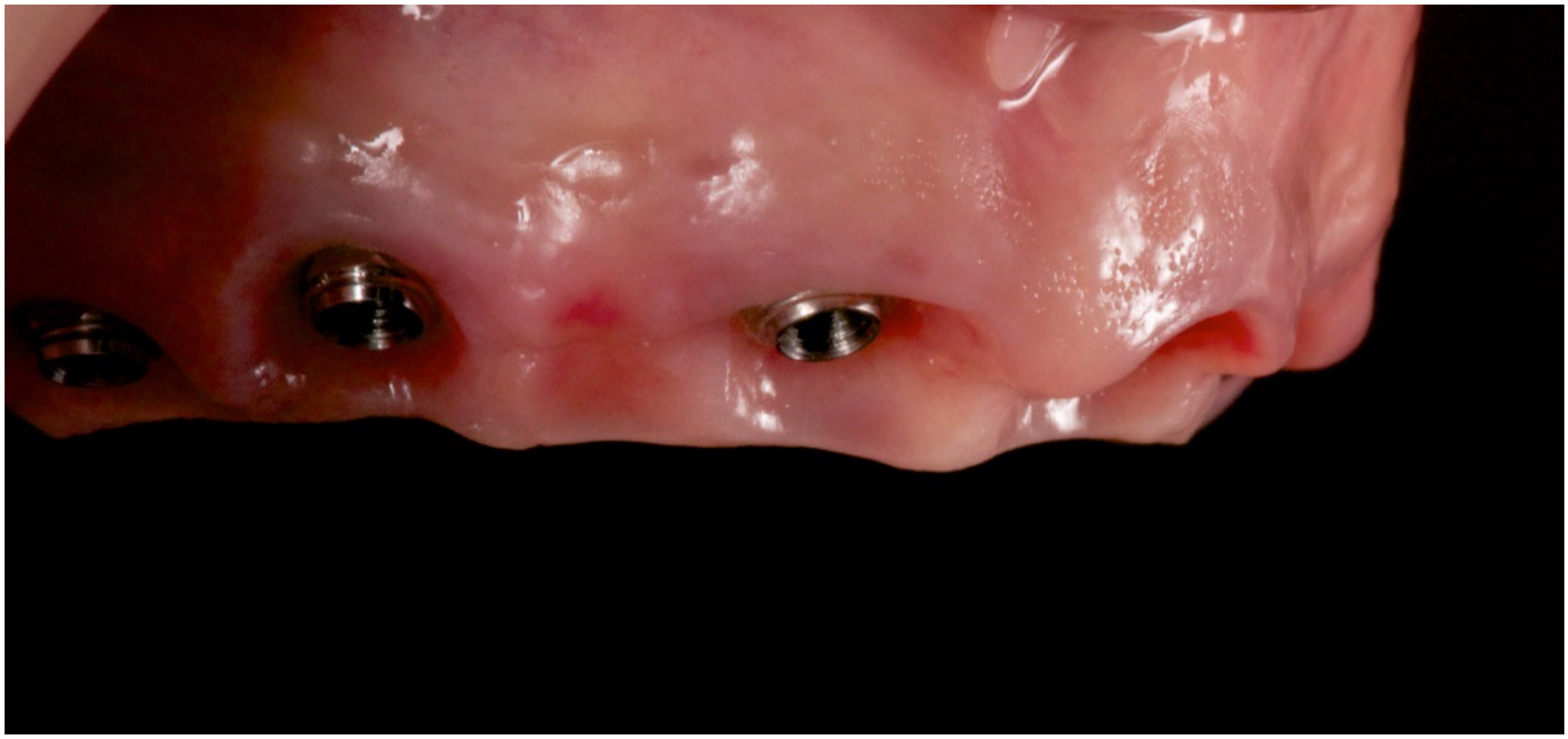
Even if there is no provisional after the surgery, it is important to reshape the soft tissue before placing the definitive prosthesis. The temporary restoration is also a way to achieve the final peri-implant shape and then transfer this emergence profile to the lab (Elian 2007).

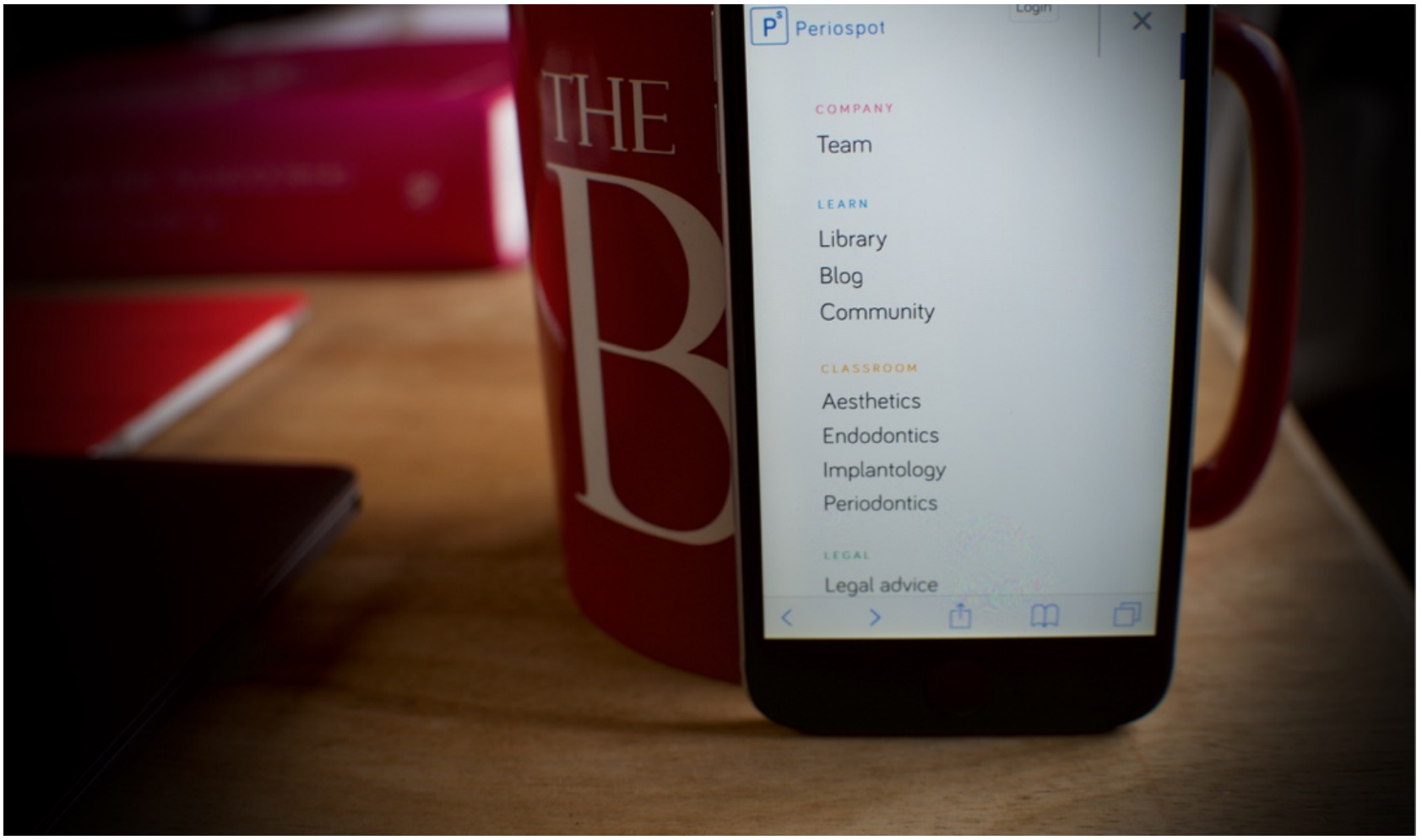
Also, in immediate implants, using a provisional restoration is helpful to maintain the soft tissue architecture (Cabello 2013).

PMMA provisionals, when manufactured under industrial environment to produce provisional restorations, have a higher mechanical and chemical stability with no monomer releasing (Edheloff 2012).

This makes the PMMA manufactured with CAD/CAM the game-changer for provisionalization in implant dentistry.

The non-existence of monomers being released to the surrounding soft tissue avoids any undesirable reaction as irritation or recession of the soft tissue.





EIGHTH LAW: PERI-IMPLANTITIS IS HERE TO STAY.

Only 20 percent of patients who were treated with implants do not present mucositis, and about 20 percent of the patients have at least one implant with peri-implantitis (Lindhe, 2008; Lee, 2017).

These are some of the numbers that have dentists quivering with dread.

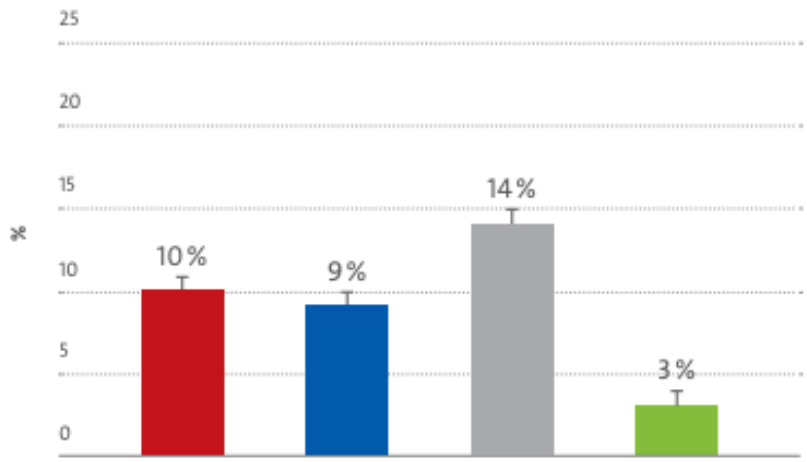
It is a multi-factorial disease with several contributing factors:

- History of periodontitis
- Smoking
- Prosthetic therapy
- Number of implants
- Limited oral hygiene
- Used implant system.

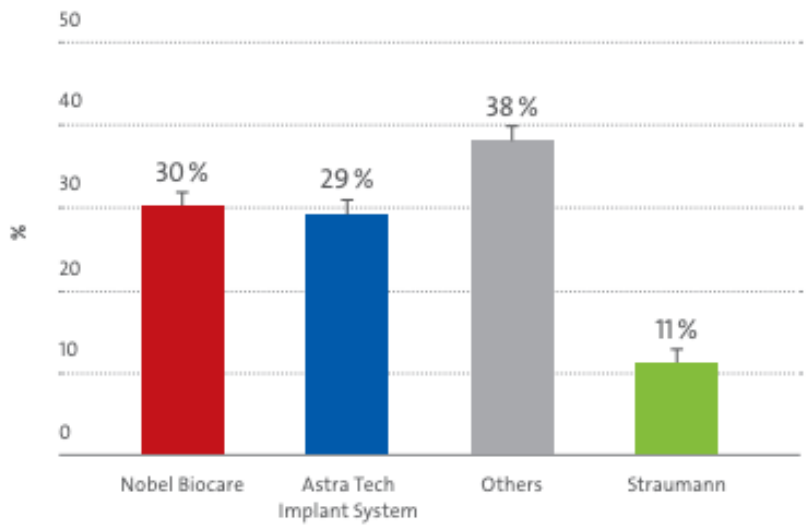
Regarding the last point, there is research that clearly states that some implant brands have less impact of peri-implantitis (Derks 2014).

Result

The probability of being diagnosed with peri-implantitis[4]
9 years after implant therapy was lowest with the Straumann TL SLA implants.



Implants (≥ 4) used by specialist in patients <u>with no</u> periodontitis
(Adapted from Derks et al.[1])

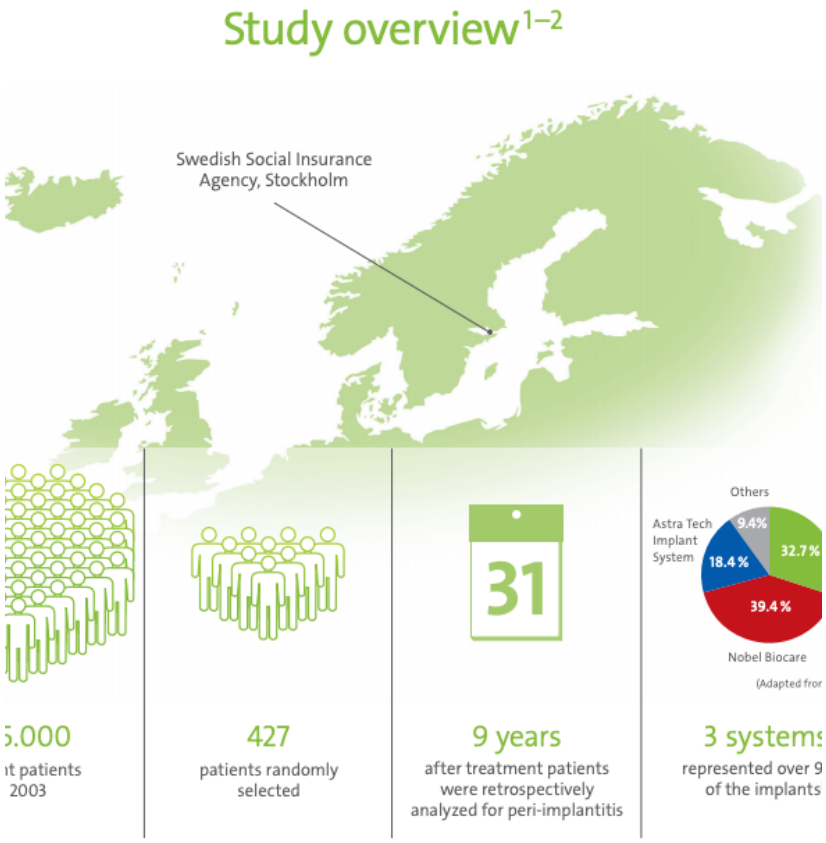


Implants (≥ 4) used by specialist in patients <u>with</u> periodontitis
(Adapted from Derks et al.[1])

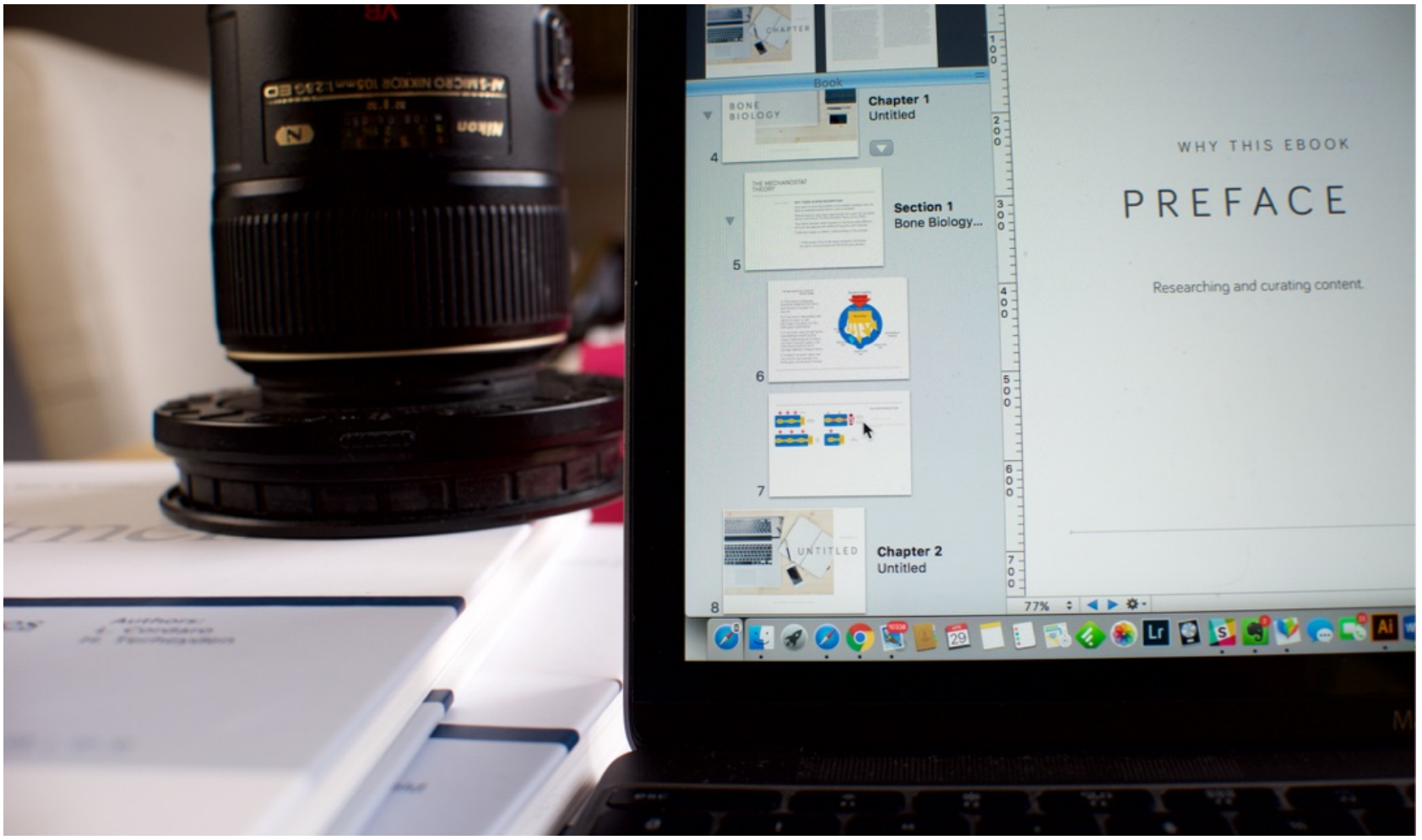
In this infographic, there is complete information about the impact of Peri-implantitis among the Swedish population.

On the other hand, some researchers pointed out that some implant surfaces may have a direct relationship with the impact and also the difficulty to treat peri-implantitis (Albouy 2011, Mellado-Valero 2013).

Also, the outcome of surgical peri-implantitis treatment is influenced by the experience of the surgical team with the surgical procedure (de Waal YC 2016).

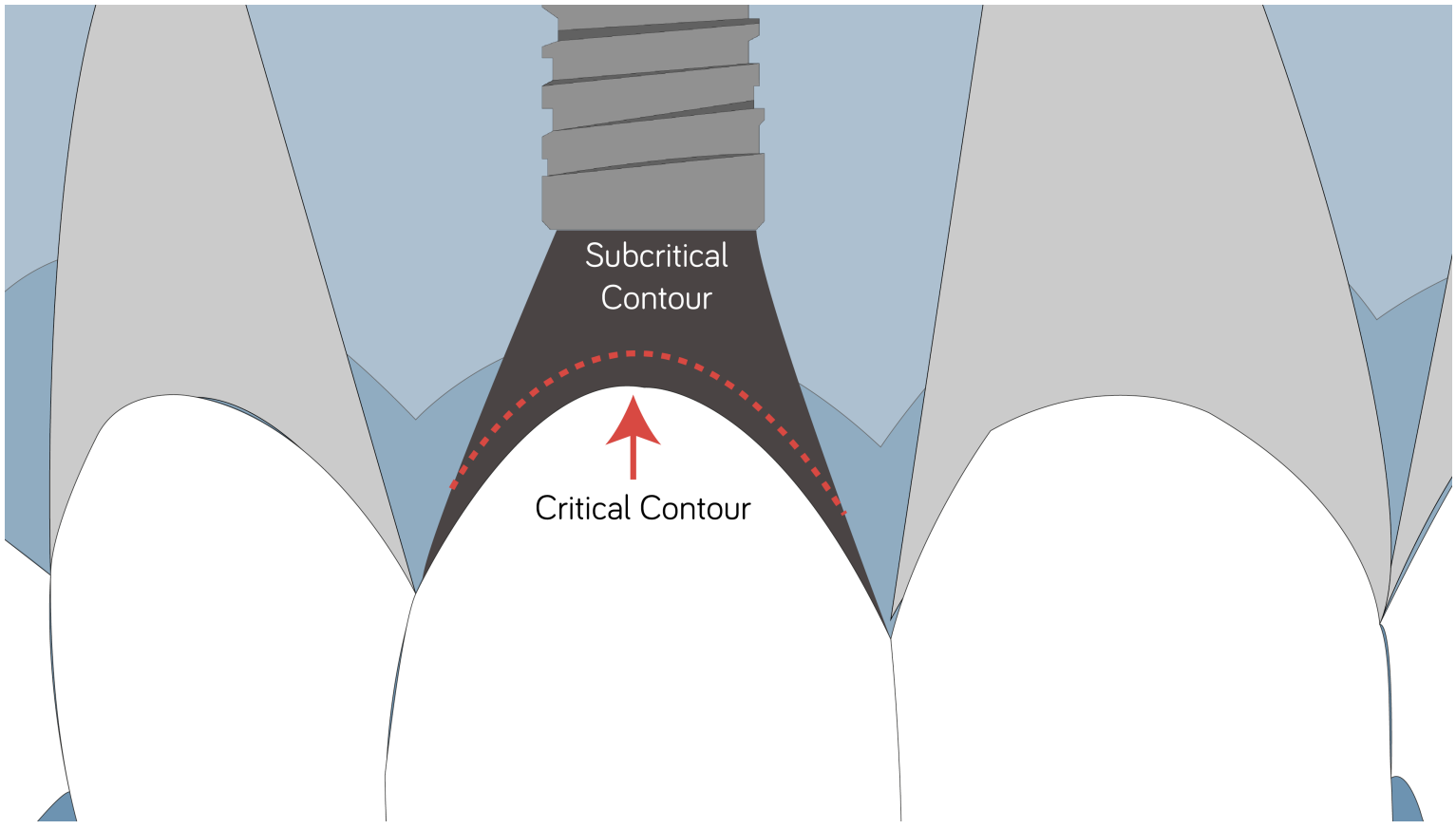


Click on the icon below or in the picture on the left to read more about Peri-Implantitis.



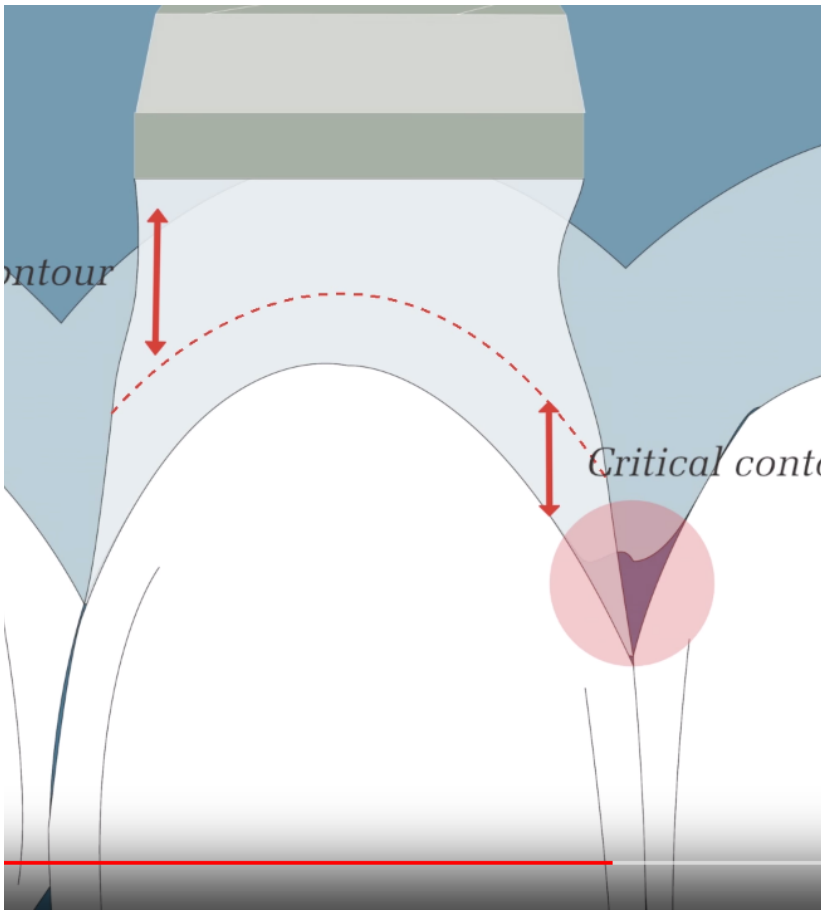
NINTH LAW: THE PROVISIONAL SUBCRITICAL AND CRITICAL CONTOUR.

During the provisional phase of the treatment, a correct and natural emergence profile should be created mimicking the adjacent teeth. In every emergence profile two contours can be identified (Su 2010):



- Critical contour: The contour 1 mm immediately below the gingival margin. This contour when modified can displace apically the gingival margin.

- Subcritical contour: Is the contour below the critical contour. When properly managed, this contour can create soft tissue volume (concave), and once this volume is created, it can be displaced where is needed.



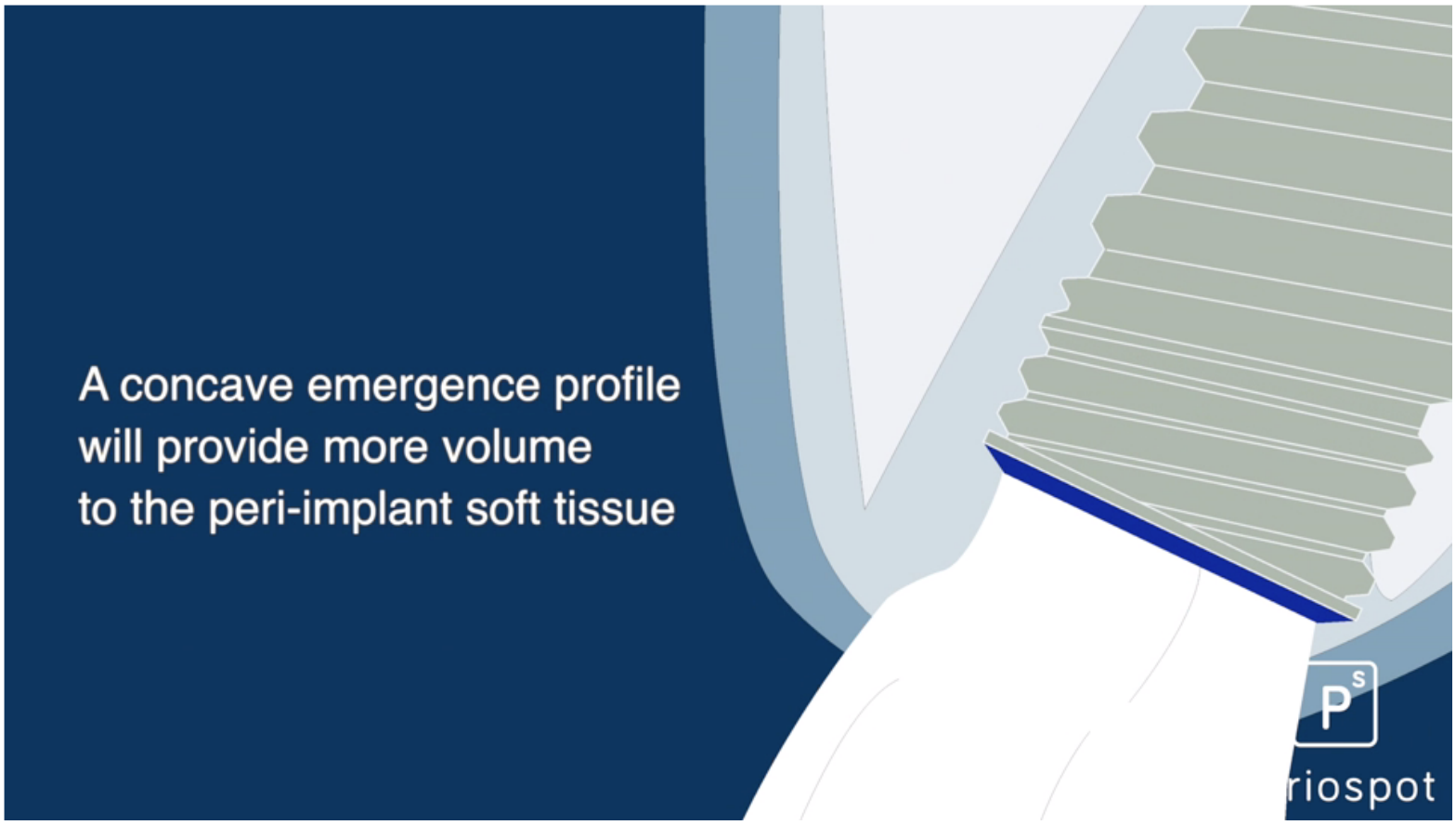
Click on the icon below or in the picture on the left watch a video about the subcritical and critical concept (Su 2010).

There are some other ways to manage the provisionals during the healing phase but always regarding the concepts posted before (Wittneben 2013).

Concave emergence profiles seems to have a positive impact.
This feature was already tested by several authors (Rompen 2007, Redemagni 2009).

Also, we should consider using a definitive abutment, placed the same day of the surgery, to avoid further disconnections (Abrahamsson 1997).

More about the concave shape of a provisional restoration in this article about immediate implants.



TENTH LAW: THE IDEAL 3D IMPLANT POSITION.

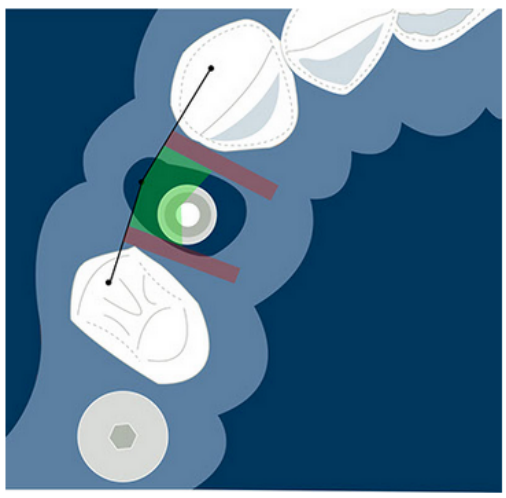
When an implant is placed in the anterior aesthetic zone, there are some rules that should be a guide for every implant placement (Buser 2004):

- Mesio-distally: The implant should be at a distance of 1,5 mm from the adjunct teeth. This is the minimal distance although there are some articles that even showed that 2 mm would be an improvement (Gastaldo 2004).

- Apico-coronally: This distance should be 3-4 mm distance from the gingival margin of the future restoration. In immediate implants, the reference is the

gingival distance of the removed teeth. If there are no teeth previously, a wax-up should create a reference point for a future restoration.

- Buccal- palatal: The buccal part of the implant should be 1-2 mm palatal to the emergence profile of the adjacent teeth.



About the apico-coronal position of the implant is important to know the difference between the different implant systems.

Supracrestal position

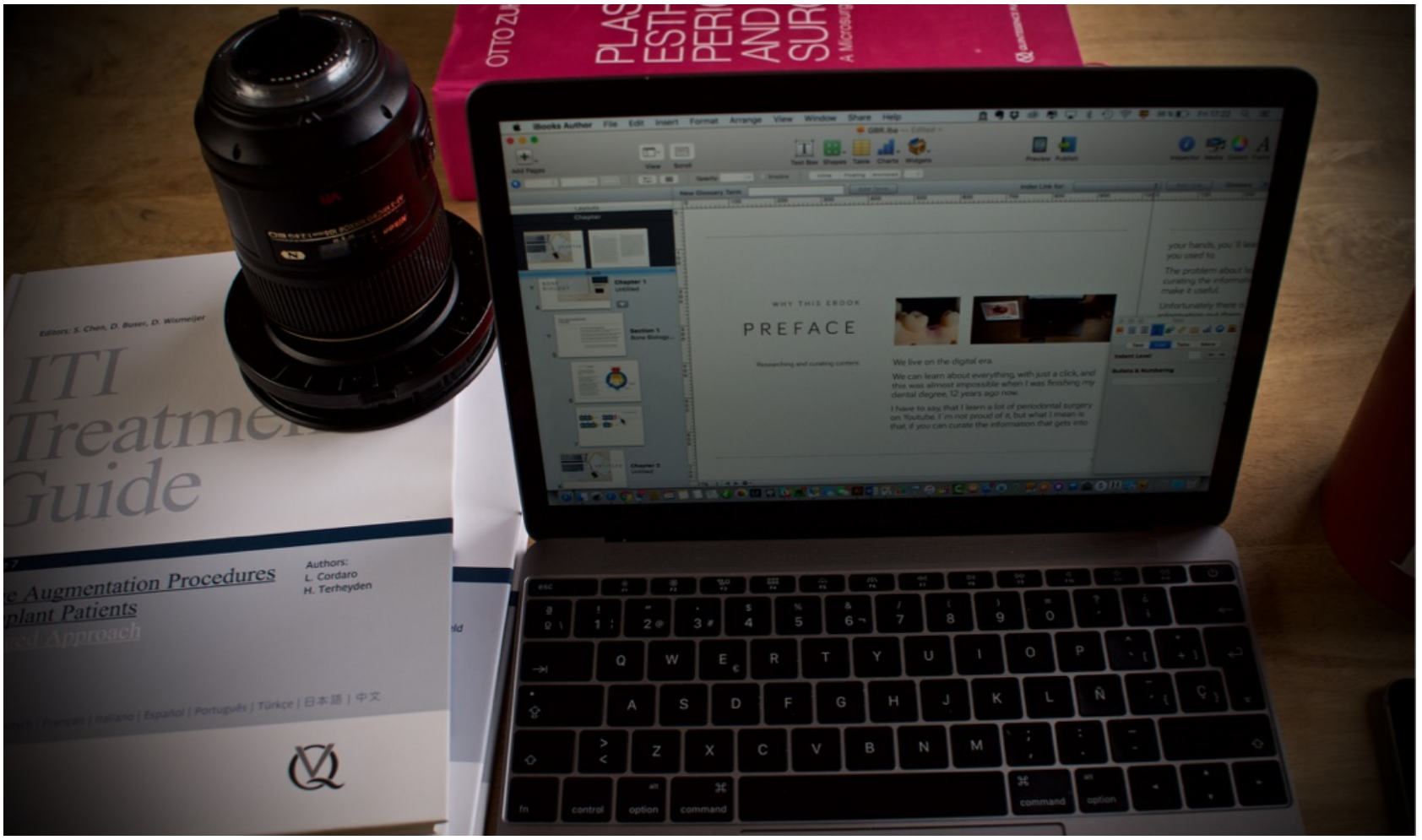
The most popular and scientifically supported implant system at the moment that shows superior clinical behaviour in the long term is the tissue level implant (Straumann®, Switzerland) and it also happens to be an implant with a supracrestal position (Derks, 2014; Seungmin, 2018).

Click on the icon below or in the picture on the left learn more about the implant position.

The advantages of this implant system come from placing the gap between the implant and prosthetic component and away from the crestal bone.

This vertical displacement of the gap away from the crestal bone is a guarantee that all the bacteria in the gap that cause an inflammatory reaction will not affect the bone (Ericcson, 1995; Hermann, 2001; Hermann, 2003).

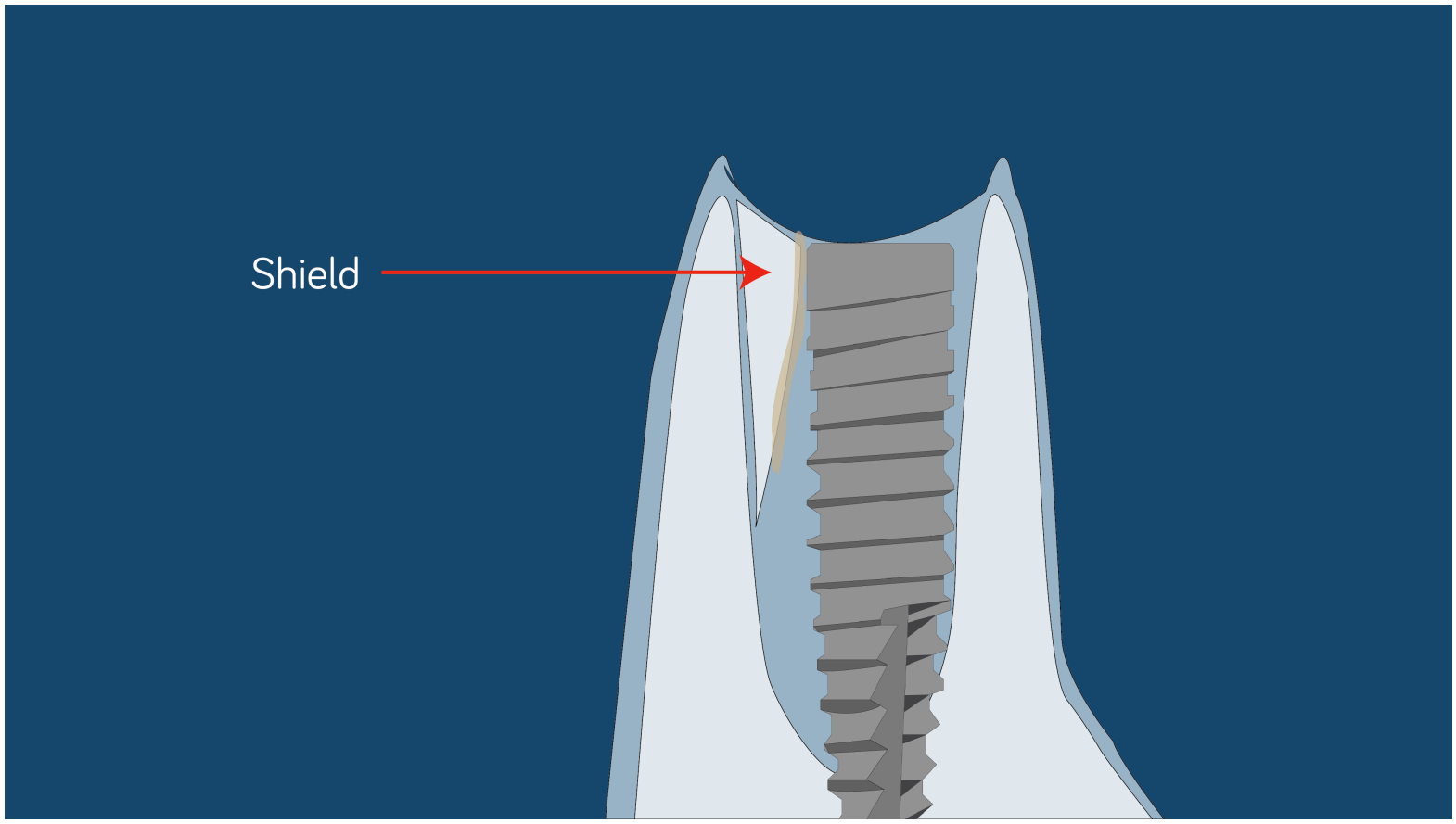
In this article there is more information about the implant placement in ideal apico-coronal position.



ELEVENTH LAW: AVOIDING THE BUNDLE BONE RESORPTION- SOCKET SHIELD

Several methods have been described to avoid the adverse effect of extraction like immediate implants (Botticelli 2004, Araujo & Lindhe 2006), barrier membranes (Lekovic 1997) although the most suitable technique advocated preserving the volume of the socket is the ridge preservation (Araujo 2009).

Lately, a new technique is being described as an option to perform an immediate implant without the negative consequences of the bone remodeling after an extraction (Hürzeler 2010), and the rationale behind this technique is preserving a tooth fragment that will avoid the resorption that takes place after the extraction.



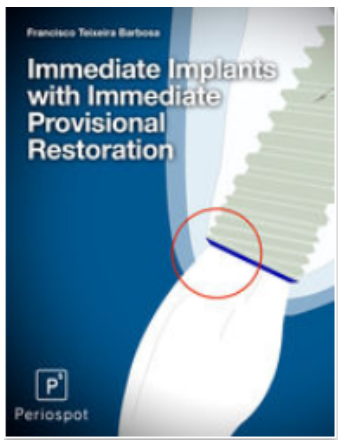
Although this technique is quite promising, we should be aware of the incoming publications about a more extensive follow up of this technique and the predictability of leaving a fragment inside the socket after an extraction (Baumer 2013, Kan 2013).
You can follow Howie Gluckman´s work about the Socket Shield technique. He is doing some research about it, and he has excellent results using this technique. He also shares other unusual cases about oral implantology. Go and check his page here.

In this video, it is well explained how a surgery involving the socket shield concept is performed. It also includes a digital impression afterward to design and produce a provisional PMMA restoration.

Click on the icon below or in the picture on the left to watch the full video about socket shield..

The advantage of digital impressions in this cases is that we can control the concave profile of the buccal part of the provisional restoration to avoid contact with the shield.

Or if you prefer you can download this iBook about immediate implants, where this topic is well explained with interactive images.



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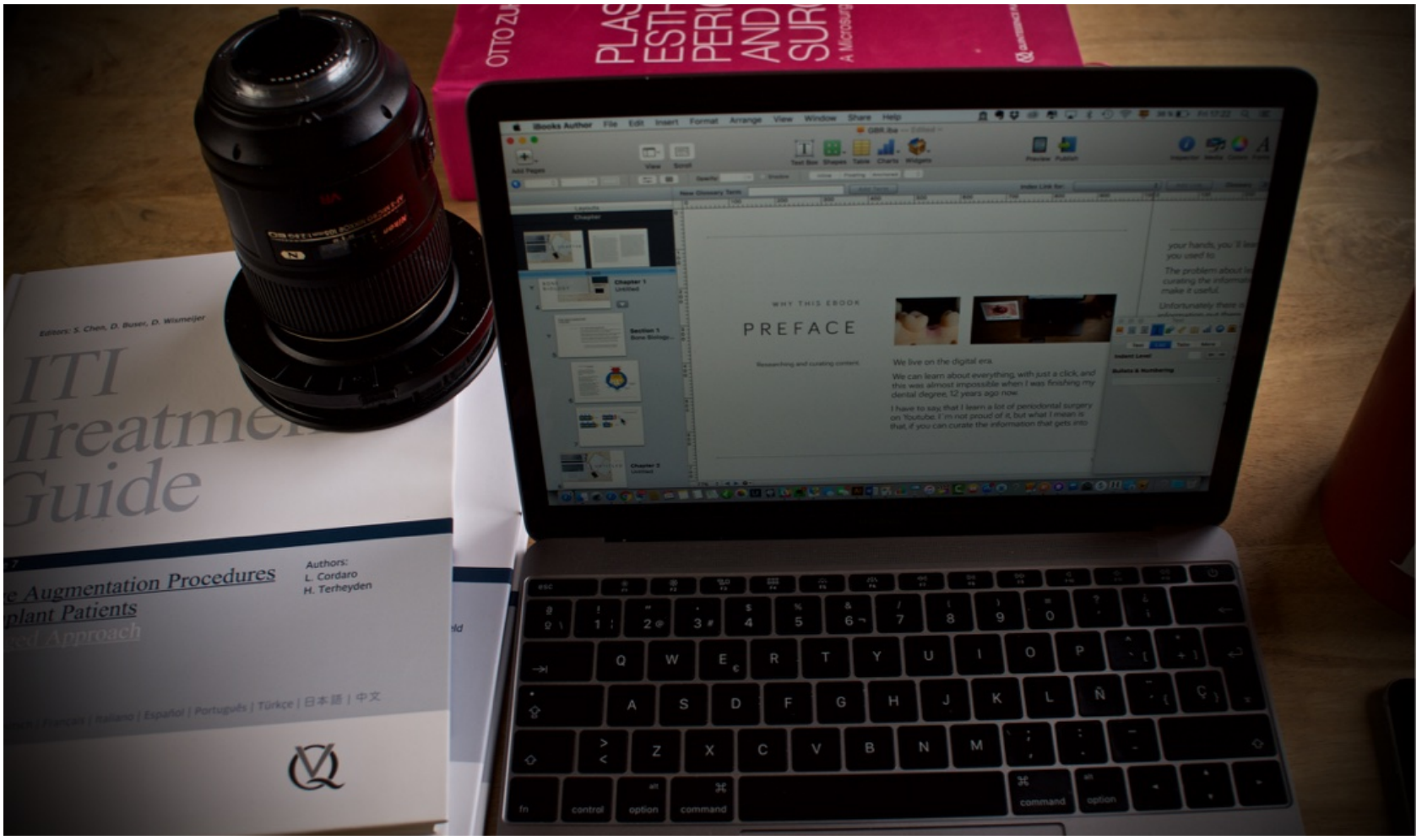
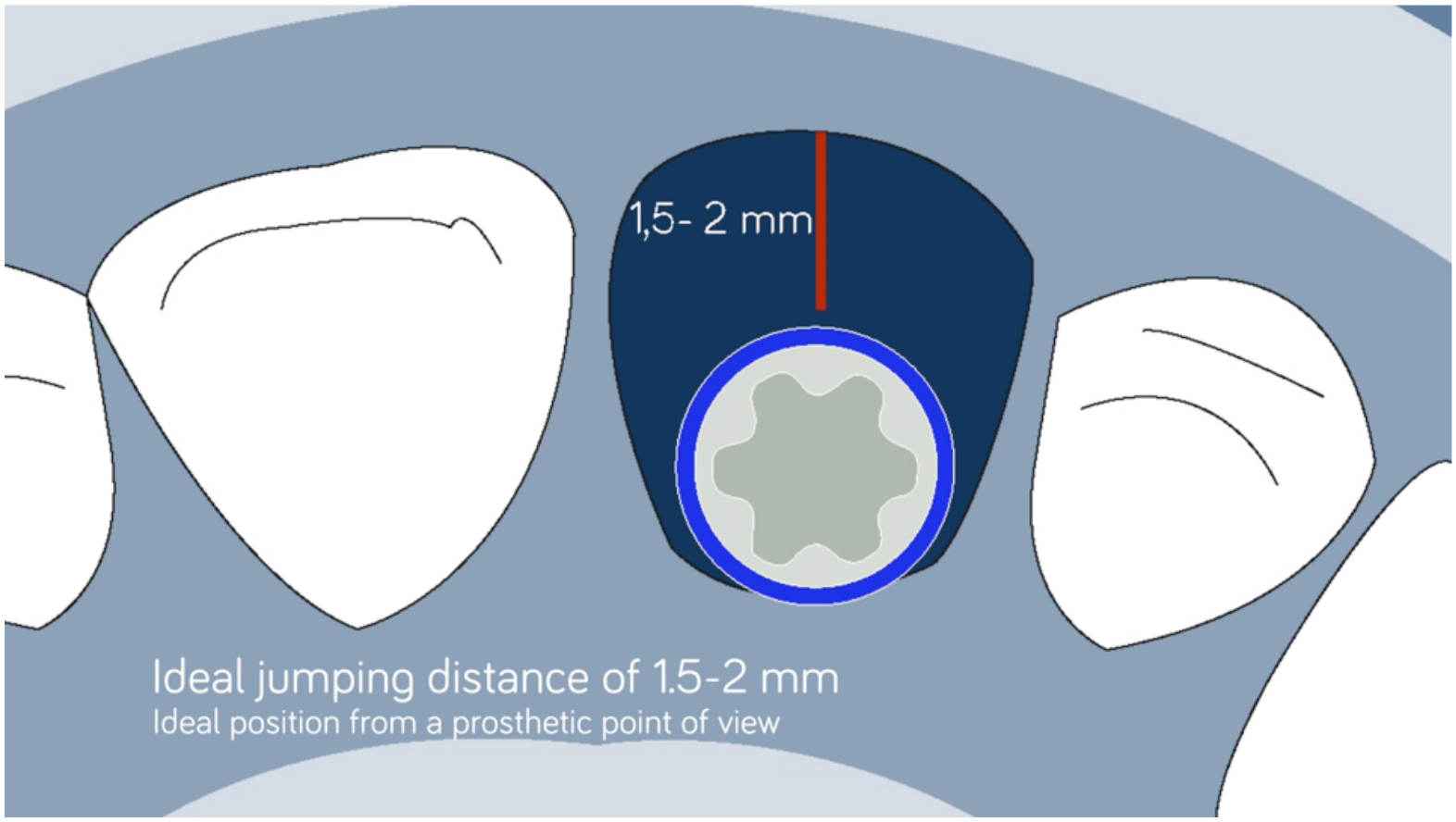


TWELFTH LAW:A GAP BETWEEN THE IMPLANT AND THE BUCCAL BONE WALL.

NOT long ago, the intuition and scientific evidence told us that we should place implants of diameters similar to the teeth we had extracted, in order to improve the primary stability by creating friction with the walls of the socket.

The lack of research on bone resorption in areas of immediate implantation along with the macroscopic design and connections of the implants that existed at that moment made us think so.

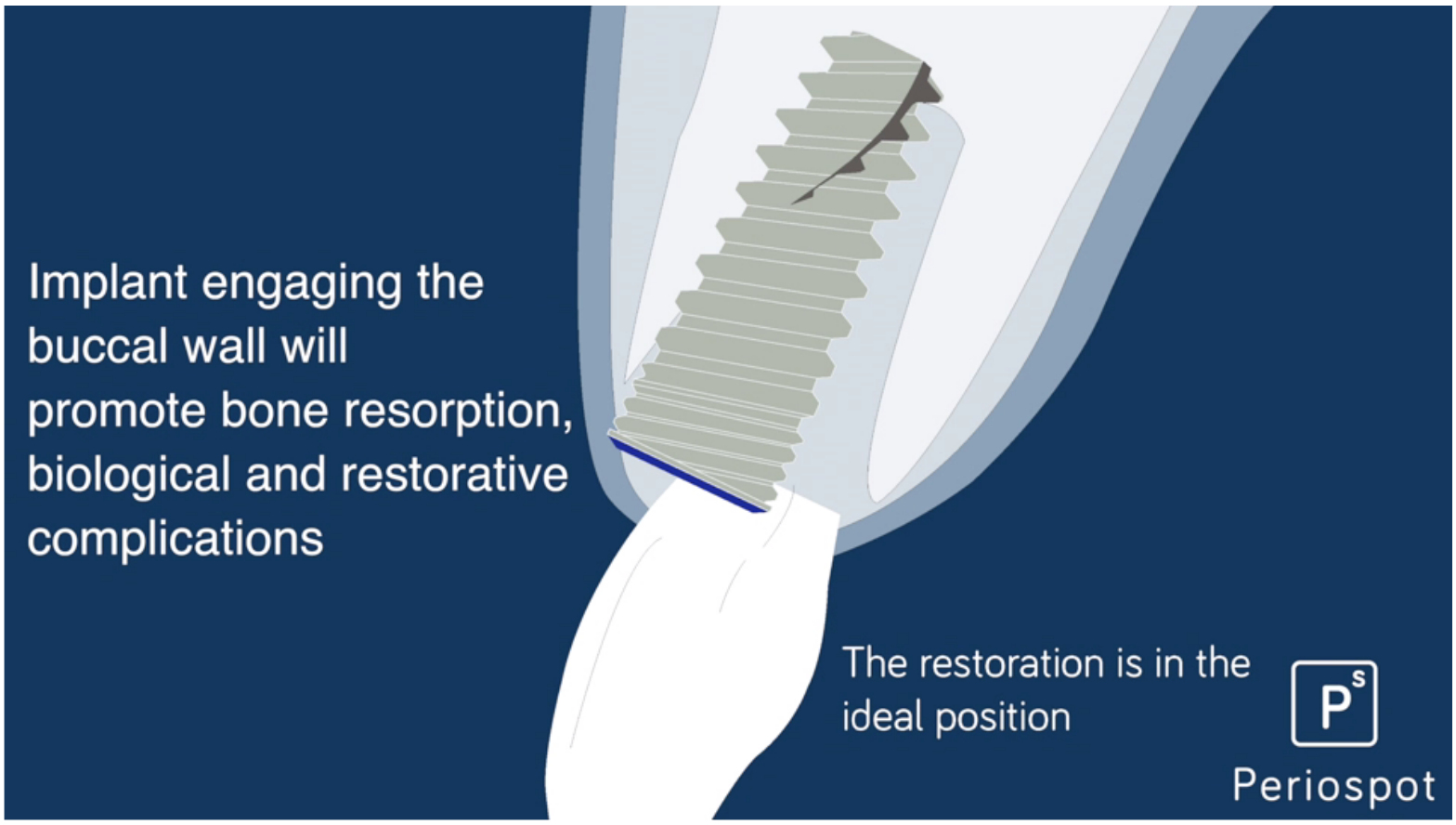
Nowadays we know that placing an immediate implant does not avoid the resorption of the bundle bone (Boticcelli 2004), for what we must try to maintain a space that allows me to place something that avoids or diminishes the resorption.



For this reason, and also due to innovation on biomechanical features, we can use narrow implants that favor the creation of a space between the implant and the buccal bone wall, in the same way, that we can stabilize the implants without having to engange with the buccal bone.

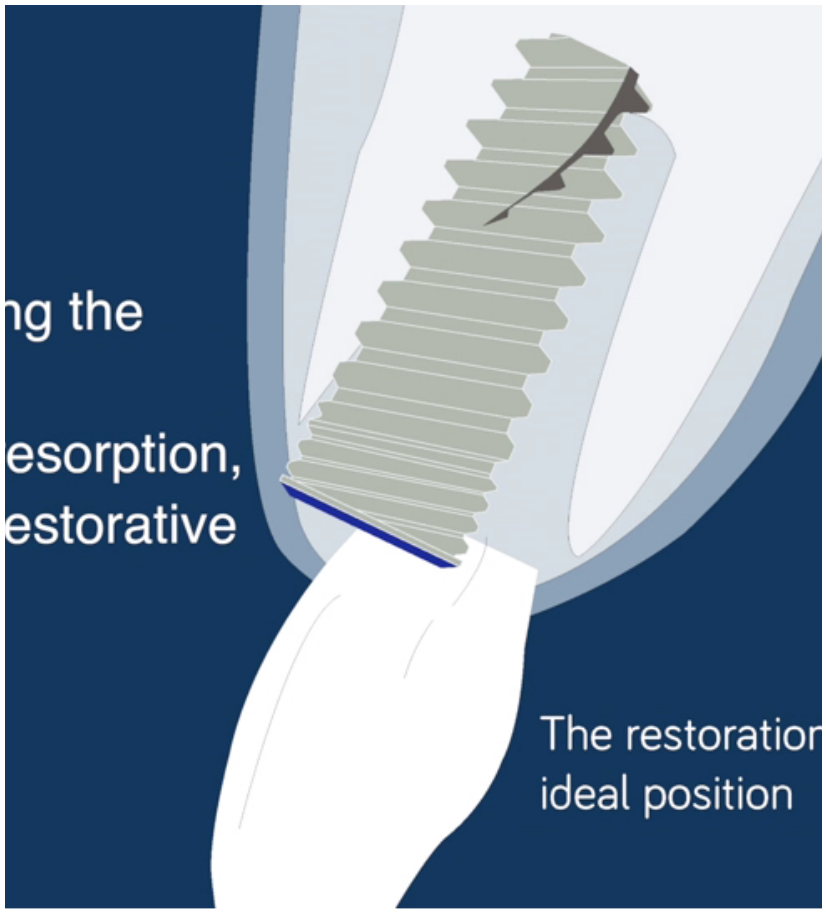
Nowadays we can use ø3.3 mm Ti-Zr implants (Roxolid®.Straumann) that have been proved to have superior mechanical resistance, compared to pure titanium alloys (Badran 2017).

We should select narrow implants that leave a gap for the creation and formation of hard and soft tissues and, yes! One mm or more of bone is preferable than one mm more of titanium.

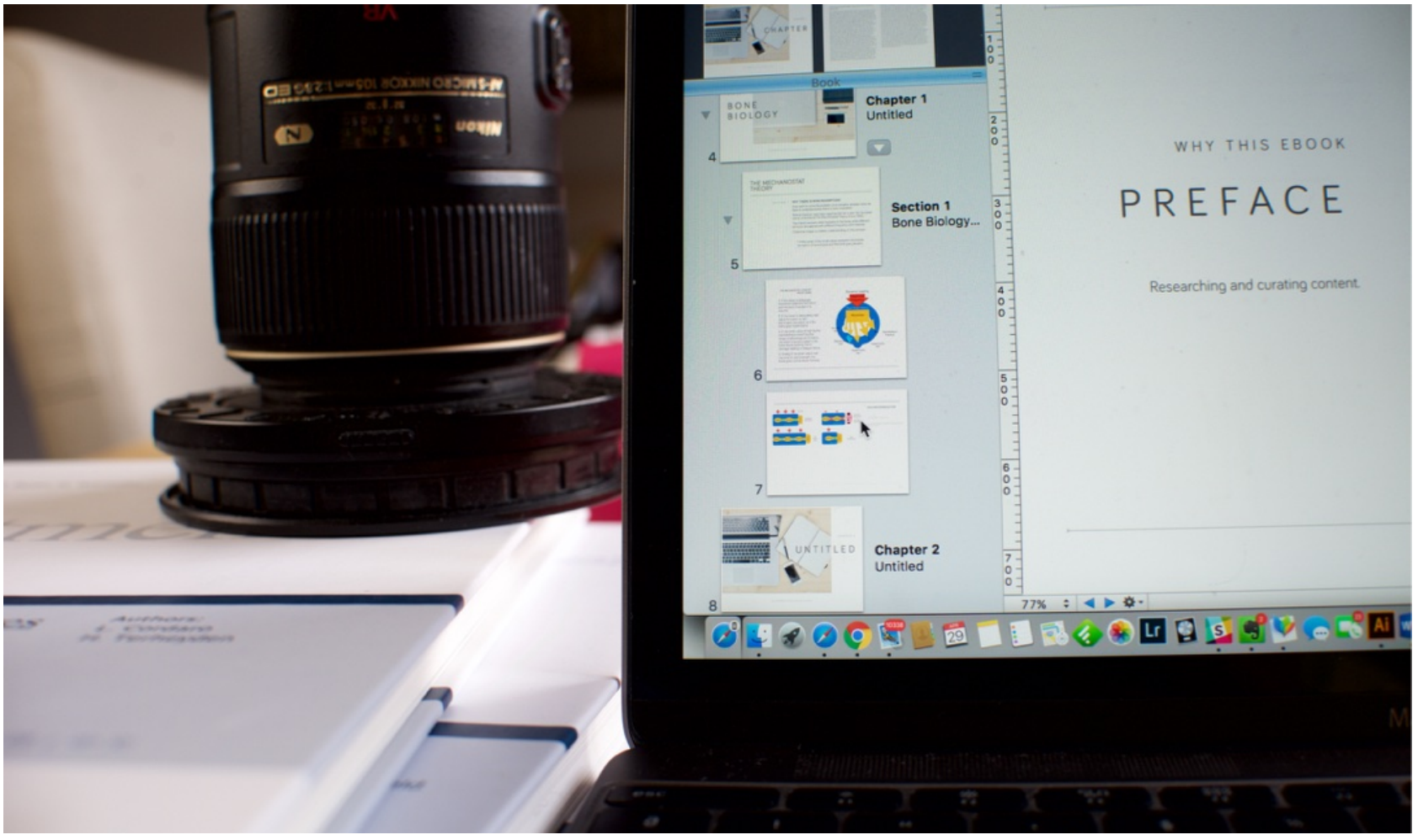


About choosing the right implant for immediate implant you can find more information in this article.

Also, we will talk latter about filling the gap between the implant and the socket wall.



Click on the icon below or in the picture on the left to read more about immediate implants.



THIRTEENTH LAW: FILLING THE GAP.

This is a quite controversial topic. There is not a consensus. The only consensus that we have so far is related to the previously described law: always leave a gap between the implant and the buccal bone wall.

But, should that gap be filled with some biomaterial?

Does it have any positive effect on the maintenance of the peri-implant contour?

Some years ago, 2001, Paolantonio published that if the gap between the implant and the bone crest is less than 2 mm, no biomaterial is needed and the blood clot would do the job.

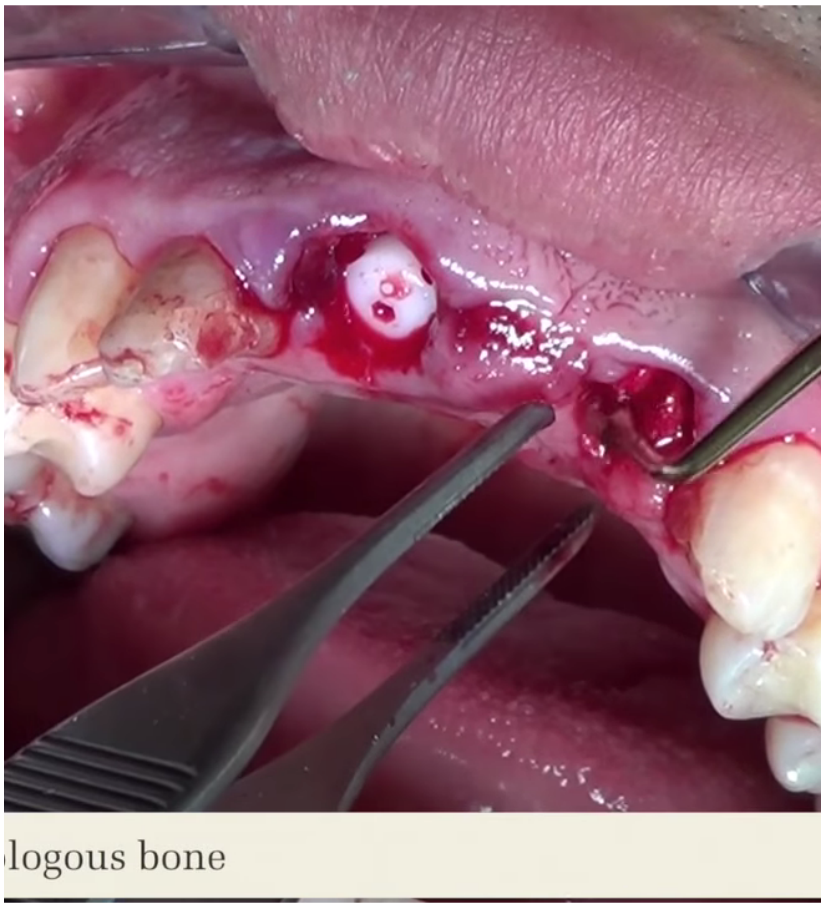
In a recent article, Araujo & Lindhe conclude that "the placement of Bio-Oss Collagen" in the buccal gap between the implant and the buccal-approximal bone walls of fresh extraction sockets, after an immediate implant, modified the process of hard tissue healing, provided additional amounts of hard tissue at the entrance of the previous socket and improved the level of marginal bone-to-implant contact (Araujo & Lindhe 2011).

The truth about this article is:

-The premolar that they used for this experiment is the fourth premolar and as we know from the previous trial (Vignoletti 2009), this is the most favorable premolar and less prone to bone resorption that the third premolar.

- If we take into account the article from Januario (2011), we conclude that maybe this trial should be repeated again in the third premolar that maybe behaves in a more similar way than the fourth premolar.

- The improvement of the level of marginal bone-to-implant contact and the amount of hard tissue doesn´t mean that the bundle bone has been preserved. The only way to preserve it is by preserving the teeth.



Click on the icon below or in the picture on the left watch a video about filling the gap after an immediate implant.

More research in human trials, similar to that one published by Sanz in 2010, but this time using a biomaterial in the gap are needed to prove definitely whats the real difference between grafting or not grafting the buccal gap of an immediate implant.

Sometimes we just perform some techniques because we read some biased article that its only goal is to try to embed us the need of something that finally will not have a differential impact in the outcome that can be appreciated by the patient.

Another important point to consider is about patient expectations: Patient-reported outcome measures should be gathered in every clinical study in which the outcomes of oral rehabilitation with dental implants are investigated.

This is why we strongly recommend you to read The ITI Consensus 2018: Patient-reported outcome measures associated with implant dentistry.

You can download it here.

FOURTEENTH LAW: THE USE OF CONNECTIVE TISSUE GRAFT. IS IT MANDATORY?

When the extraction is performed, and due to the deficit of vascularization, a process of resorption begins that not only influences the hard tissue but also affects the soft tissue, in a greater or lesser way depending on the biotype of the patient (Schropp 2003).

There is some controversy with whether we should always place connective tissue or if it will depend on factors such as biotype, smile line, tooth... but the only thing that is unavoidable is the volume variation that will come after an extraction.

In a previous chapter we already mention alveolar ridge preservation, but if in case we left the socket healing spontaneously, it is very likely we will have to augment the volume with a soft tissue graft.

One of the most common procedure is to harvest the connective tissue graft from the anterior palatal.

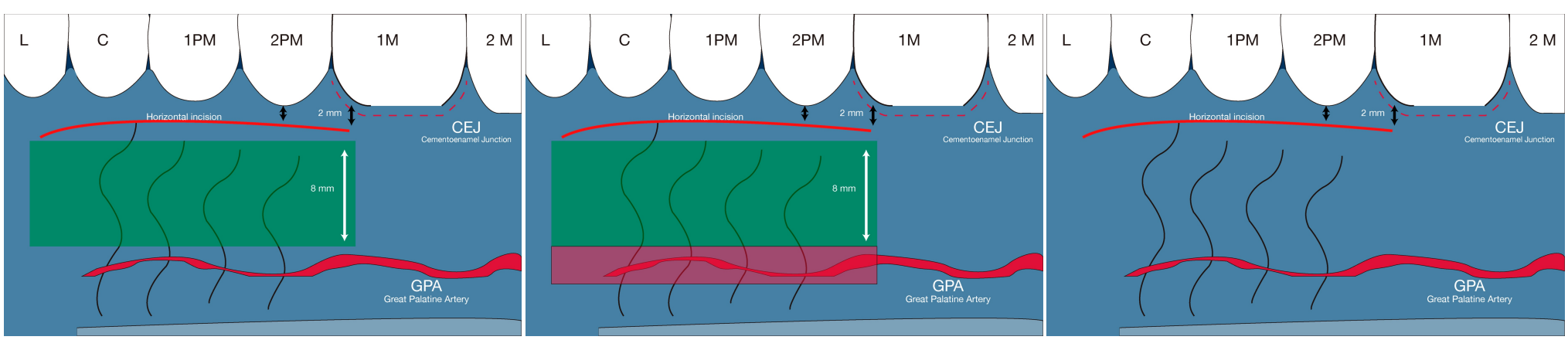
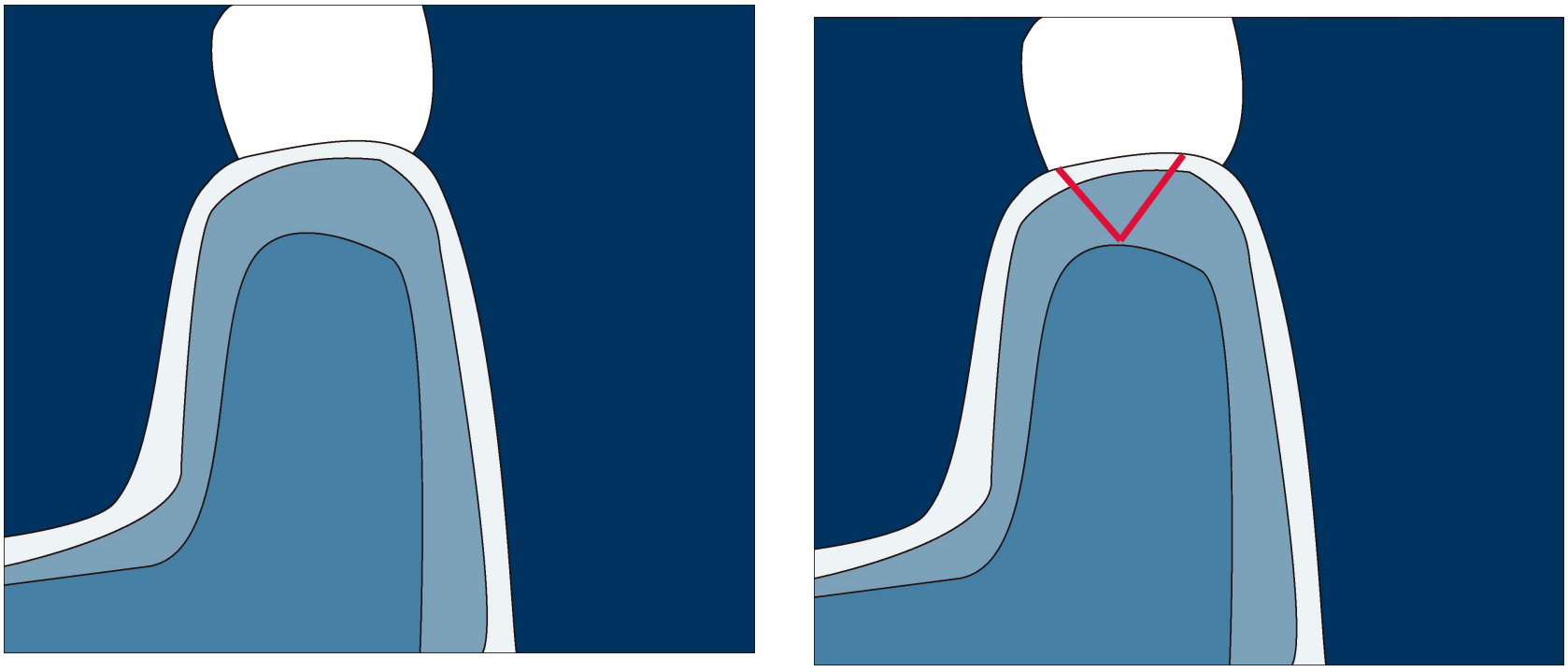


Fig. 4, 5, 6 - The first horizontal incision 2 mm below the gingival margin and the 8 mm (the size of the No 15 blade) immediately below those 2 mm are the security or comfort zone where the SCTG can be harvested.

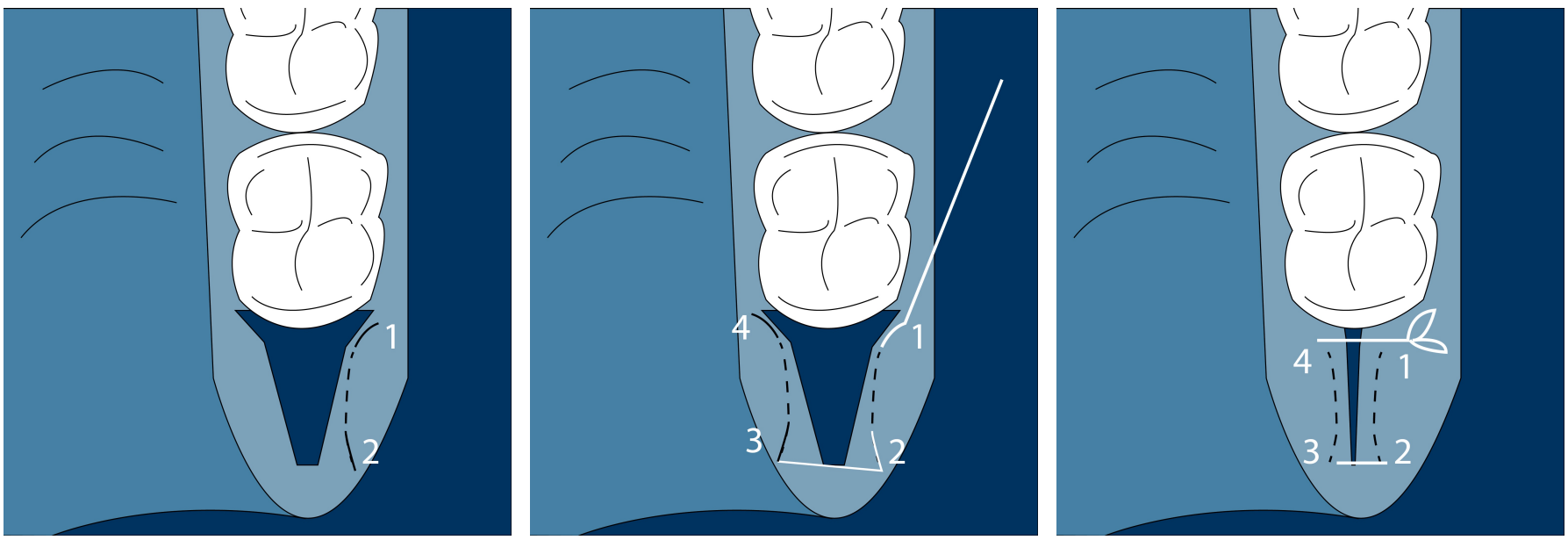
In the case that we do not need a large amount of connective tissue graft, we can take it from the tuberosity of the maxilla.

This donor area is an accessible area, but sometimes there is the presence of the wisdom tooth that limits the amount of tissue that can be harvested.

In cases where we need more tissue or we cannot use the tuberosity, our choice will be connective tissue of the palate.



Converging incision with a "V" shape at the tuberosity is a reliable and easy approach to get a nice amount of connective tissue to graft. For those who are beginning with soft tissue augmentations maybe this should be the chosen approach for the first cases.

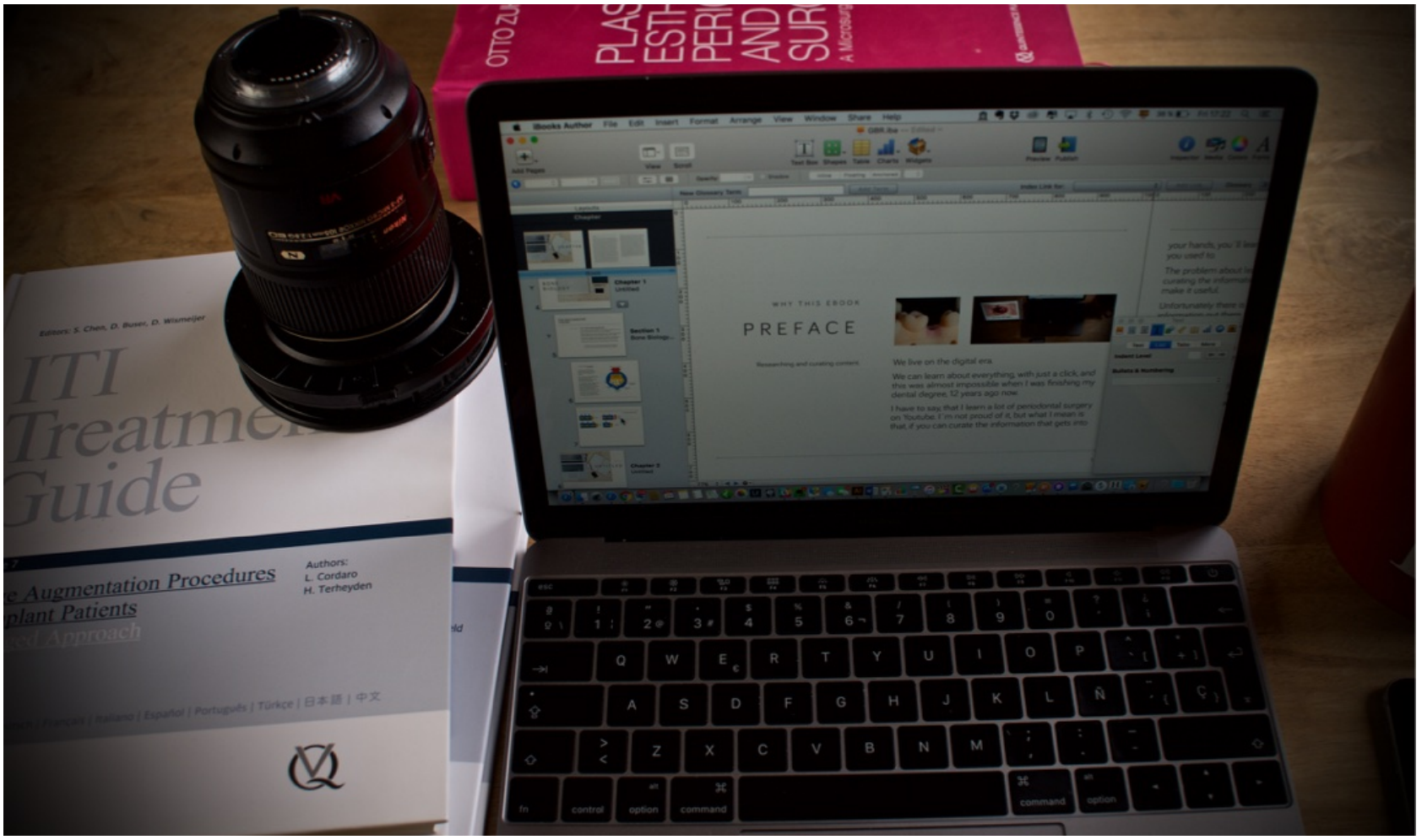


Crossed periosteal suture to close the donor site to achieve apical reposition of the flap and wound compression. Interrupted sutures can be used to close the remaining distal flap. The numbers on the illustrations (1,2,3,4) explains the sequence to perform the crossed periosteal suture.

Click on the icon below or in the picture on the left to download the free ebook about connective tissue graft.

Last but not least, pediculated tissue graft will provide up to 20% more volume than a free connective tissue graft (Akcalı 2015).

In this link there is a video with a complete surgery with an implant placement and a connective tissue graft.



FIFTEENTH LAW: HIGH INSERTION TORQUE IS NOT ALWAYS POSITIVE

We could say that torque is like jealousy.

Lack of or excessive jealousy may kill a relationship. Just like the insertion torque during implant placement. Too much can be counterproductive.

But, what is the torque value we should consider to be the maximum during an implant placement?

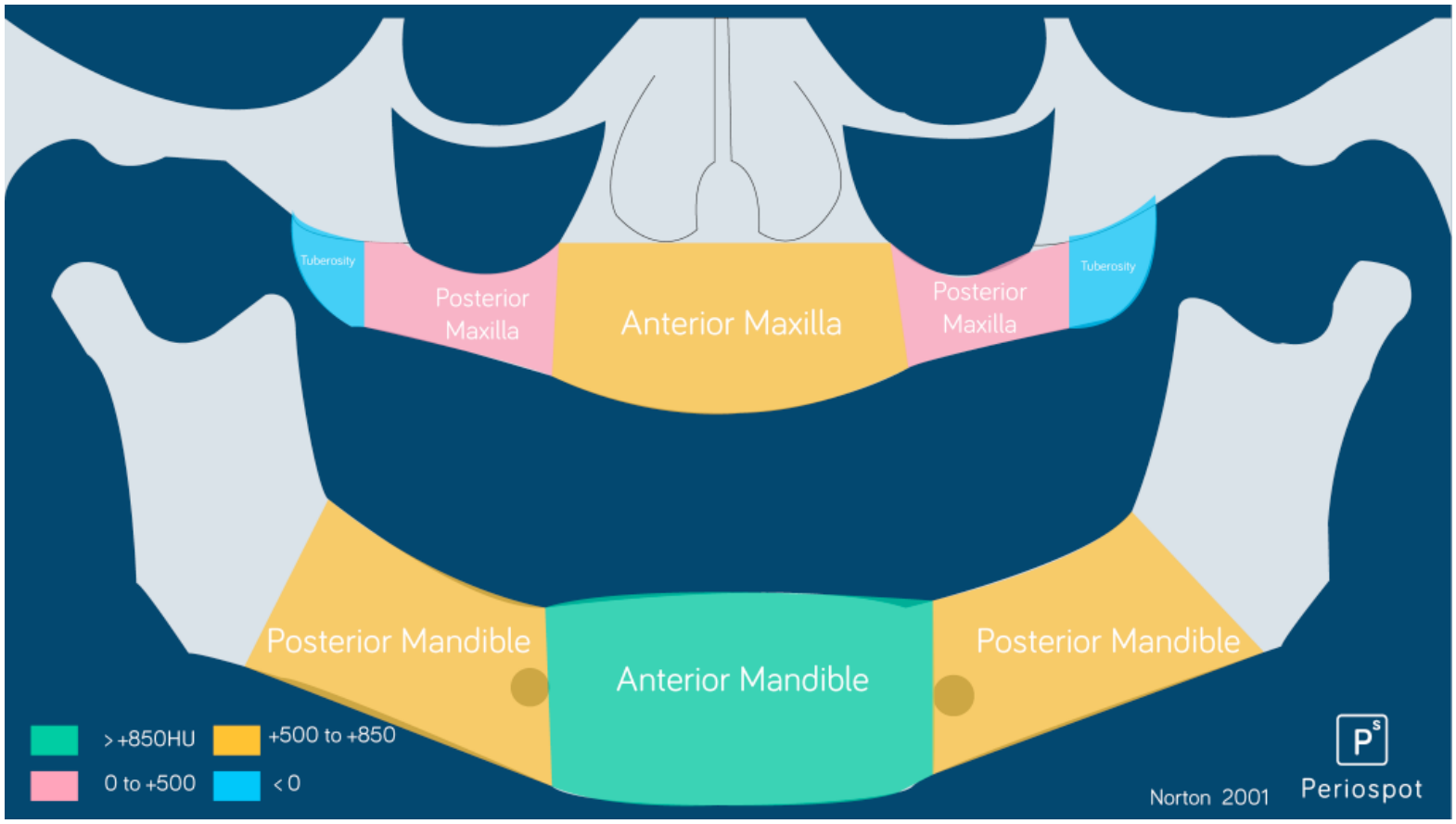
Do torque affects all type of bone the same way?

And, what can we do to avoid complications caused by an excessive torque?

These questions are just an example of the doubts that may come up to our head when we are stuck in a surgery placing an implant in a type I bone.

It makes sense to connect “high torque” with “high primary stability” which leads to an implant that is less likely to suffer any micro-movement during the healing process.

This micro-movement threshold should be somewhere between 50 µm and 100 µm during the osseointegration healing process (Trisi 2009).



Expected bone density depending on the zone where the implant is planned to be placed.

Click on the icon below or in the picture on the left to a free ebook about implant stability.

There are other authors that this range is between 50 µm-150 µm, but as clinicians, it is impossible to know how much micro-movement is being applied to an implant that we just placed (Szmukler- Moncler 2000).

The more underprepared is the site where the implant is going to be placed the more strain and stress will be applied to the surrounding bone.

We should know what the size of the last drill compared with the implant width and only place the implant in the underprepared site in the maxillary posterior region where the bone quality is often poor (Turkyilmaz 2008).

When we apply osseocompression to a high-density bone, the physiological limit is exceeded bone resorption is triggered (Jimbo 2015).

We should avoid exceeding this physiologic limit when we place the implant by properly prepare the site for the fixture.

When a micromotion phenomenon above 150 µm is present during the healing phase, the implant will be very likely to suffer a fibrointegration instead of osseointegration (Gao 2012).

So the primary goal is to reduce that micromotion to the minimum during the earlier phase of osseointegration. This issue is critical in an immediate loading approach.

We tend to place implants with a high torque just because “we feel comfortable” when we do an immediate loading in implants that were placed with high torque.

Some publications proved that maybe there is no correlation between high torque and micromotion and no need to have a high torque to perform an immediate loading (Norton 2011).

In this publication, Norton proved that in single implants immediately restored a torque of only 25 N.Cm was enough to achieve favorable survival rates and optimal maintenance of marginal bone levels.

On the other hand, Jimbo tested an implant with a modified macrogeometry that yielded to reduced bone remodeling and lower levels of micromotion (Jimbo 2015).

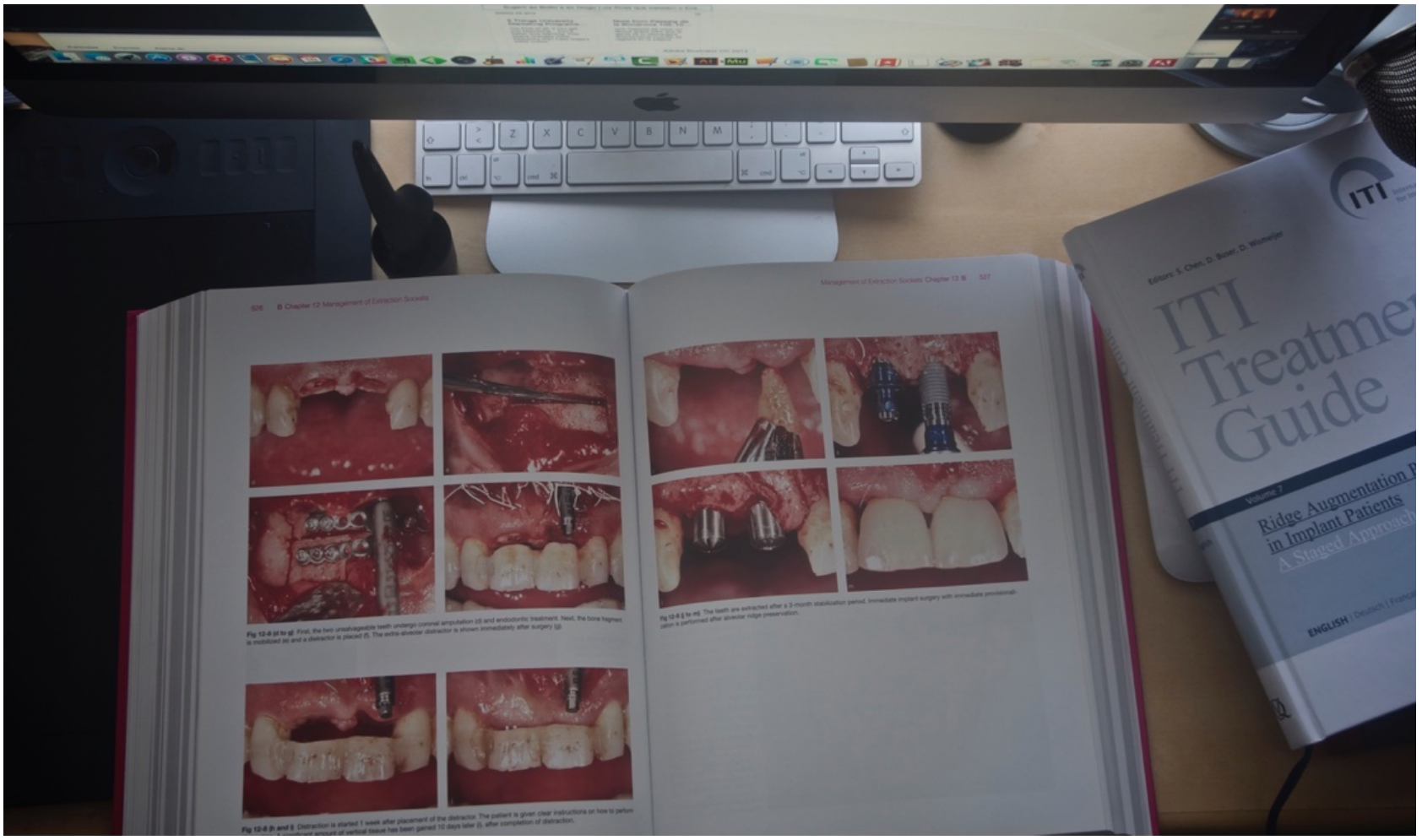
Excessive torque (≥50 N.Cm) can lead to more peri-implant bone resorption and tissue recession, and the negative impact of high torque can be more clear if the buccal bone thickness is inferior to 1 mm (Barone 2015).

If there is a thin buccal bone wall during the implant placement, we should know the more likely it will be to resorb. Some publications stated that we should have at least 2 mm of buccal bone when we place the implant. More exactly 1.8 mm (Spray 2000).

Click on the image above to watch the video that explains the article published by Spray in the year 2000.

In a case scenario where we place an implant with high torque and the buccal wall is very thin (less than 1 mm), the more likely we will have more resorption and more soft tissue recession (Barone 2015).

With such a thin buccal bone wall, the blood supply to that cortical is very limited and also applying strain and compression to that fragile bone is not a good idea.

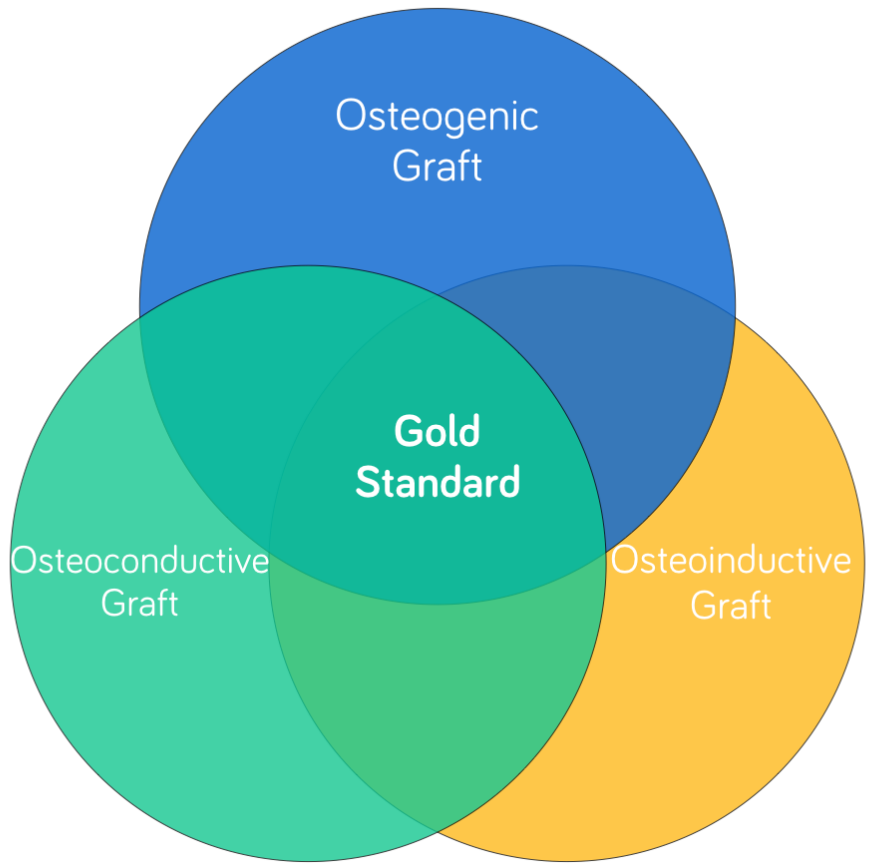


SIXTEENTH LAW: AUTOLOGOUS BONE GRAFT IS THE GOLD STANDARD.

If you are familiar with cooking, you know that to be successful as a cook, you need a good recipe, spectacular ingredients, and of course, someone to taste it. But if you have an only a great recipe but your ingredients are not the best, and if you are the only one who´s going to taste the dinner, in this case, it will be only an acceptable dinner.

But we all seek for the gold standard, and in bone augmentation that is a graft material that has the osteogenic, osteoinductive and osteoconductive properties.

And in oral surgery, the one that has the 3 properties is the autogenous bone graft.



Autogenous Bone Graft

An autogenous bone is a bone tissue transferred from one location to another within the same individual.
It is the gold standard: osteogenic, osteoinductive and osteoconductive properties.
It can be harvested from intraoral sites, like ramus, symphysis or even from the drills, during site preparation with the biological drilling protocol (Anitua 2007).
There are only two disadvantages in using autologous bone:
- Limited availability.
Morbidity at the donor site.

Allogenic Bone Graft

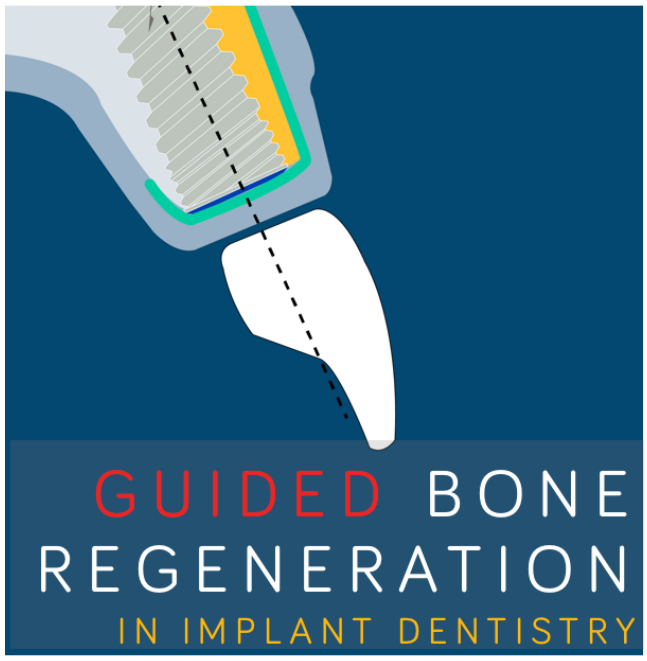
Allogenic bone graft is bone collected from human cadavers or living donors.
It has an unlimited availability and the advantage of avoiding the morbidity caused by the wound at the donor site.
Allogenic graft has osteoinductive and osteoconductive properties but no osteogenic potential due to the lack of viable osteogenic cells.
The main disadvantages of the allografts are:
- Risk of infection transmission.
- Host rejection.

Xenograft

Xenograft is a graft that is harvested and transplanted into a different animal species.
The most common xenografts are porcine and bovine.
Deproteinized bovine bone (DBB) is the most commonly used in implant dentistry.

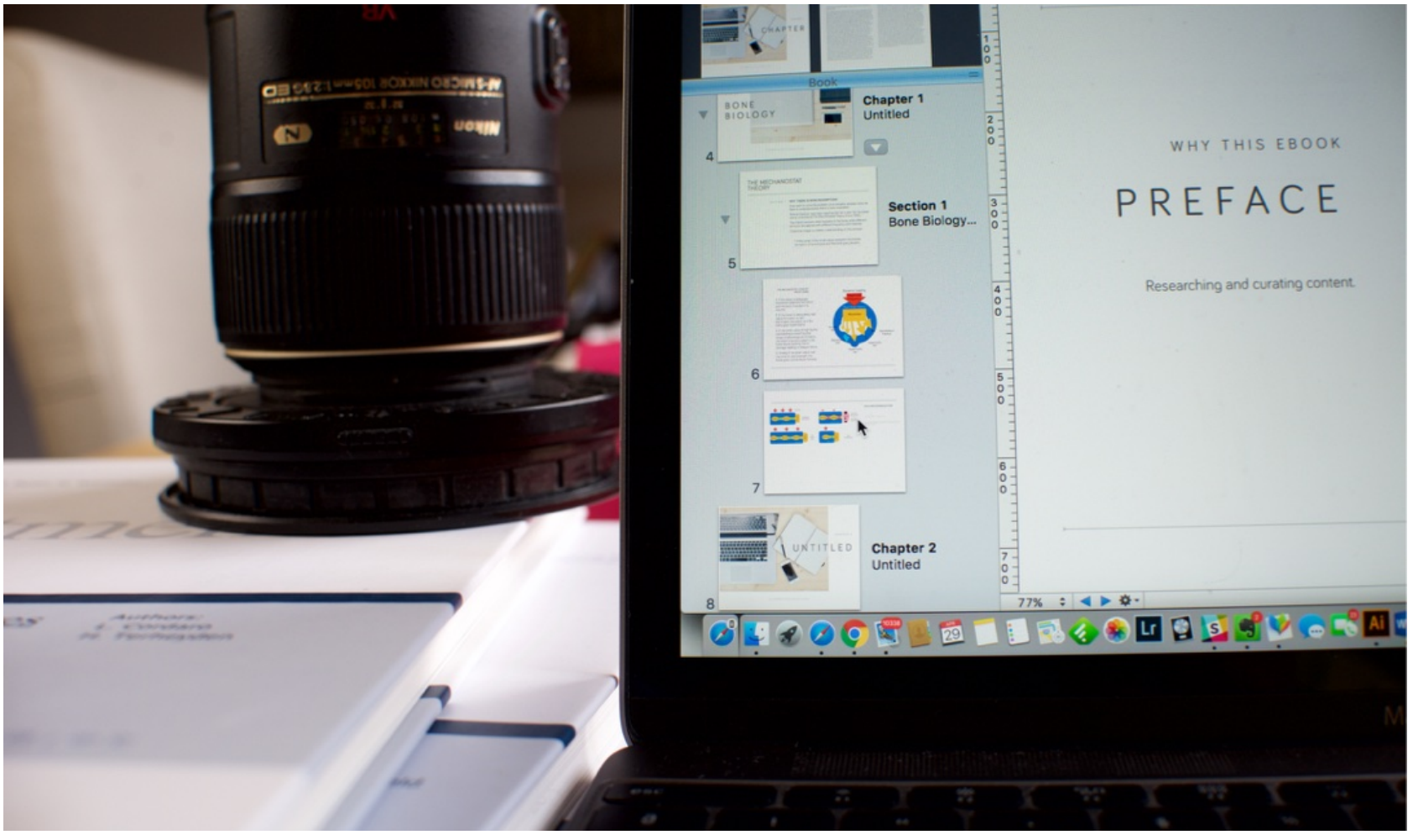
Synthetic bone substitutes

Various types of CaP biomaterials have been commercialized for clinical bone augmentation. Particular attention has been given to HA due to its bioactivity, and to β-TCP due to its bioresorbability.



Click on the icon below or in the picture on the left download the iBook about Guided Bone Regeneration.

iBooks



SEVENTEENTH LAW: USE RELIABLE SOURCES.

This ebook is aimed to provide value to the reader explaining concepts that they can be (im)mutable.

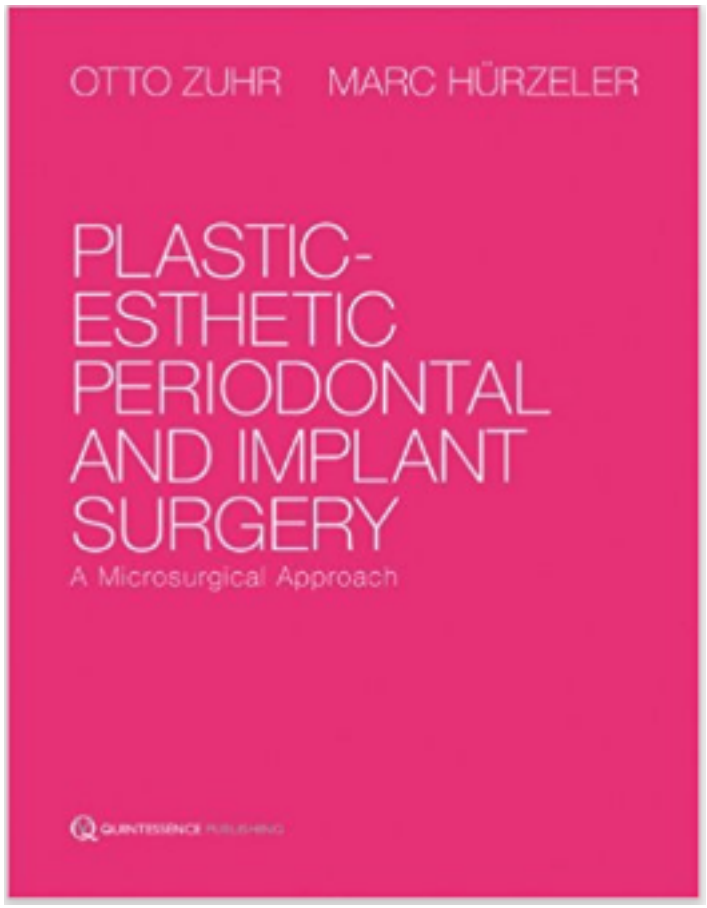
The point is that we should never believe in just one source. There is always biased articles, books and other documents that can lead us to perform some therapeutic approach that may be proved in the future that it is not reliable or predictable.

That's why we would like to finish this ebook recommending you some books that you should also consult and read.

These books are considered pieces of art and if dentistry is your way of life, you should definitely consider at least start reading one of them.

Spoiler: We included our iBook about GBR in this list. It is not a piece of art as the other recommended books, but still, we put there hours of work and t is still be updating (that the cool stuff about iBooks, they can be updated as an App).

(The images and the logos take you directly to Amazon)



Plastic-Esthetic Periodontal and Implant Surgery

Probably the best book about periodontal and implant surgery.

The cases, photos and content is outstanding.

Rate: 10/10

Click here to buy online

Available at amazon

EVOLUTION: Contemporary Protocols for Anterior Single-tooth Implants

This is a master piece. The most outstanding cases and pictures about aesthetic implant dentistry

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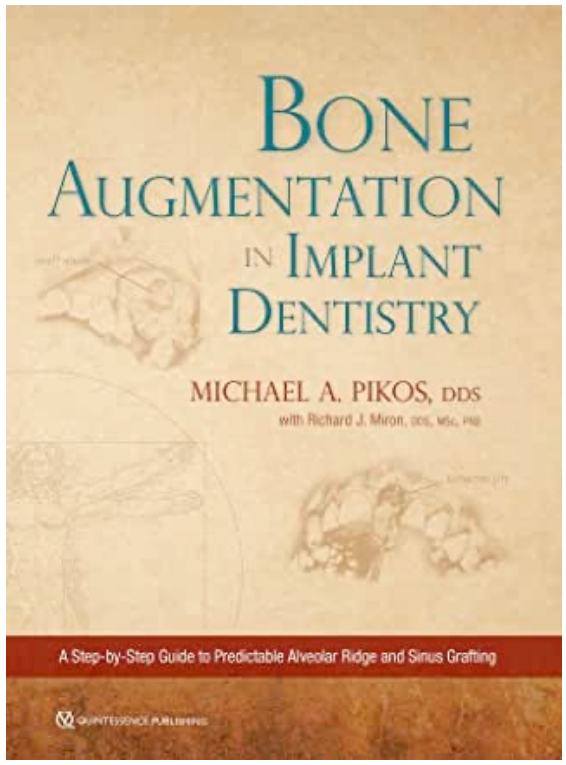

Bone Augmentation in Implant Dentistry

A comprehensive guide about guided bone regeneration by Professor Pikos.

Rate: 8/10

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USE RELIABLE SOURCES

Implant Therapy in the Esthetic Zone, Current Treatment Modalities and Materials for Single-tooth Replacements

An update of the first edition for single implants in the aesthetic zone based on the 5th ITI Consensus.

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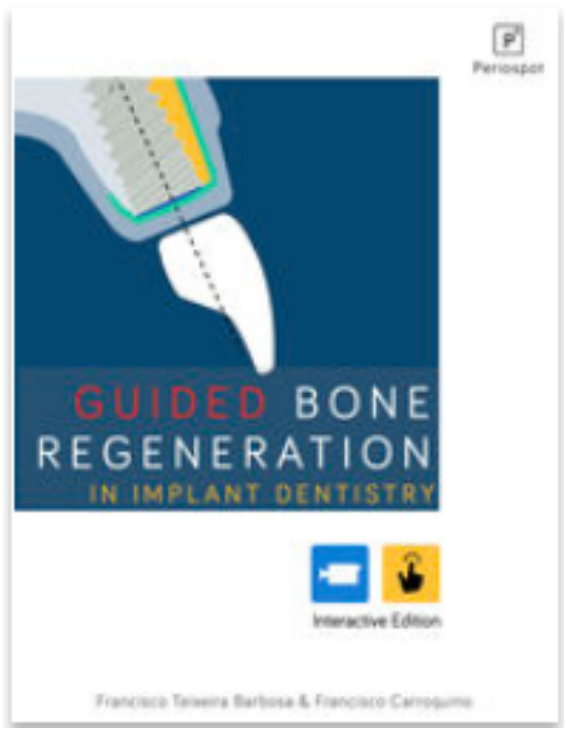

Guided Bone Regeneration in Implant Dentistry

This book has embed videos, animations and clinical cases. A complete guide to solve cases based on the different bone defects.

Rate: We do not rate our own books 😊

Click here to buy online

iBooks

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