

An Intra-oral Cement Control System

A Great Solution to a Big Problem

Dr. Emil L.A Svoboda PhD, DDS

Fellow of the AGD

Honored Fellow AAID

Diplomate ABOI/ID

Implant Treatment Has Improved

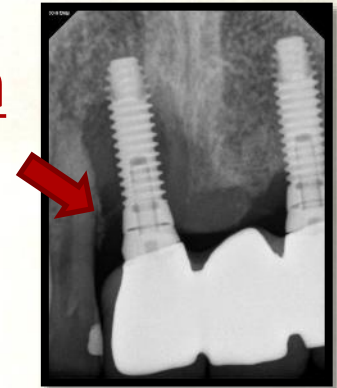
The Level of Care that we can offer our Patients

Complications are still a Worldwide Problem

Meta-analyses weighed mean prevalence

Peri-implant mucositis 43%

Peri-implantitis 22%



1. Peri-implant diseases are common complications of implant dentistry
2. Clinicians should inform their patients prior to treatment
3. **Clinical strategies should include preventative measures**

Derks J, Tomasi C. Peri-implant health and disease. A systematic review of current epidemiology. *J Clin Periodontol* 2015; 42 (Suppl. 16): S158–S171. Department of Periodontology, Institute of Odontology, The Sahlgrenska Academy at University of Gothenburg, Gothenburg, Sweden

Jepsen S et al. Primary Prevention of peri-implantitis: Managing of peri-implant mucositis. J Clin Periodontol **2015**;42 (Suppl. 16) S152-S157
(2131 patients, 8893 implants, 43% mucositis, 22% peri-implantitis)

“at present no established and predictable concepts for the treatment of peri-implantitis, **primary prevention is of key importance**”



- **Preventing peri-implantitis is by managing peri-implant mucositis**
- The correct fit of implant components is important to avoid additional niches for biofilm adherence (**mechanical issues??**)
- Prosthesis design to facilitate sufficient access for regular diagnosis and hygiene
- If cemented, keep margins supragingival to allow meticulous removal of excess cement. Going subgingival carries a higher risk of developing peri-implantitis

4 Big Reviews 2013-2015

Mucositis

33% of **Implants**

Peri-implantitis

16% of **Implants**

Failure Rate of implants

4% 5 years, 8% 10 years

No Difference Between Cement or Screw Installation

Atieh MA et al. The Frequency of Peri-implant diseases: A systemic review and meta-analyses. J Periodontol 2013;84(11):1586-1598

Whittneben et al. Clinical Performance of Screw- Versus Cement Retained Fixed Implant-Supported Reconstructions: A Systemic Review. The Int J Oral Maxillofac Implants; 2014;29(Suppl):84-98.

Sherif S et al. A Systematic Review of Screw- versus Cement-Retained Implant Supported Fixed Restorations. J of Prosthodontics 2014 (23)1-9

Daubert DM et al. Prevalence and predictive factors for peri-implant disease and implant failure: a cross-sectional analyses. J Periodontol 2015;86(3): 337-347

Treatment Complications

**Disappoint the Patient and
Create Conflict between the
Patient and the Dentist**



Can be Very Costly to the Dentist

1. Loss of Productive Time
2. Working in a hostile environment
3. Negative Referrals and Loss of patients
4. Cost of retreatment
5. Possible college and legal action

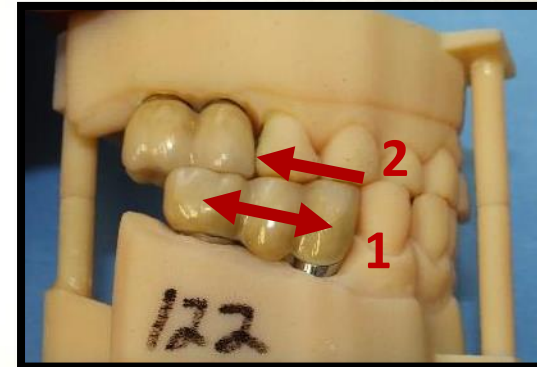


The BIG Problem with Screwed-in Prosthetics is that they are Assembled on Models

Models are not accurate enough to prevent Stress and Misfits

at the implant-abutment connection (1)
when installed into the Mouth

Tight contacts can add to this problem (2)



There is just too little tolerance in this system.

This technique does not take advantage of a superior connections.

A Model Error of up to 150 microns is considered clinically acceptable*.

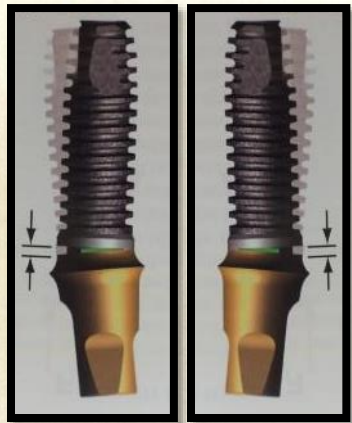


Figure of implants above from "Dental Implant Prosthetics, Carl E. Misch, Elsevier Mosby, 2015 Pg 740

Even the theoretical suggestion of "not more than 10 microns error", by PI Branemark in 1985, could be considered sloppy when considering that **periodontal pathogens are only 1 micron in diameter and less.**



*Review: Passive Fit in Screw Retained Multi-unit Implant Prosthesis Understanding and Achieving: A Review of the Literature. M.M.Buzaya and N.B. Yunus. J Indian Prosthodont Soc. **2014**, Mar;14(1):16-23

***Passive Fit could not be achieved with Screwed-in Prosthetics!**
This can create Mechanical and biological complications.

Comparison of the Accuracy of Different Transfer Impression Techniques for Osseointegrated Implants. Zen BM et al. JOI Vol 41 No 6 2015: 662-667

Branemark PI, Zarb GA, Albrektsson T. Tissue -integrated prostheses. Chicago: Quintessence; 1985. p. 253

Multiple unit screwed-in prosthetics just amplify the Implant-Abutment Misfit Problem!

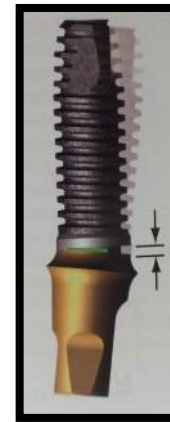
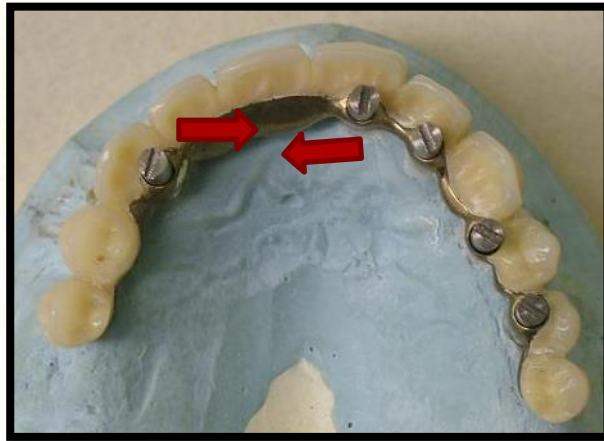
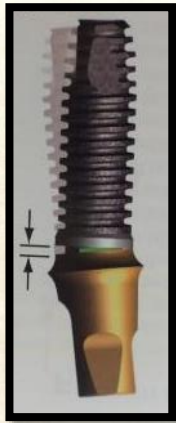


Figure of implants above from "Dental Implant Prosthetics, Carl E. Misch, Elsevier Mosby, 2015 Pg 740

This BIG PROBLEM is Corrected by Intra-oral Cementation!

Dental Implant Prosthetics. Carl Misch, 2nd Edition, Elsevier-Mosby, 2015, Ch 28.

Passive Fit in Screw Retained Multi-unit Implant Prosthesis Understanding and Achieving: A Review of the Literature.

M.M.Buzaya and N.B. Yunus. J Indian Prosthodont Soc. 2014, Mar;14(1):16-23 – an elusive goal!

Bacterial leakage of different internal implant/abutment connections. Nasar HI and Abdalla M. Future Dental Journal 2015

Intra-oral Cementation Technique

Parts are

Assembled in the Mouth

Abutments are Individually screwed onto dental implants and their fit is not affected by prosthesis-model inaccuracies or tight contacts.

Implant-Abutment Connections are Optimized!

Ensures a Passive Fit with the Prosthesis!



The BIG PROBLEM is Residual Subgingival Cement!

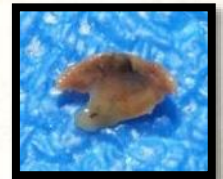
“Subgingival Residual Cement” Many Deny having this Problem!

But ... Excess cement can go deep into the peri-implant tissues where it is difficult to see on x-rays and where it can be very hard to remove from the surfaces of the prosthesis, abutments and implants.

And ... Bulky and/or Cantilevered prosthetics can block access to effective instrumentation.

Others Focus ONLY on this Problem!

and forget about implant-abutment misfits.



Cementation in Dental Implantology. An Evidence Based Guide. Edited by Chandur P.K. Wadhvani. Published by Springer 2015.

Residual Excess Cement & Peri-implant Disease

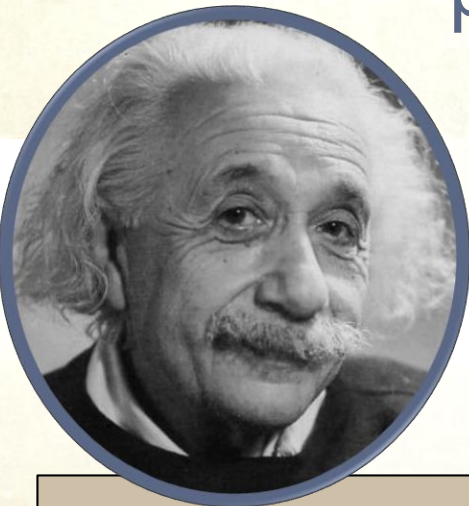
1. All patients received cemented single unit implant crowns
2. 39 consecutive patients with 42 implants having peri-implant disease were studied - **test**
3. 12 of the same patients had 20 implants without disease and without detectable subgingival cement – **controls**
4. **34 of 42** the test implants had Residual Subgingival Cement (**81%**)
5. **After Cement Removal 25 of the 33 (74%)** no longer has signs of peri-implant disease

“60% of the Cases Got Better When Residual Subgingival Cement was Removed”

Thomas G Wilson Jr. The Positive Relationship Between Excess Cement and Peri-implant Disease: A Prospective Clinical Endoscopic Study. J. Periodont 2009;1388-1392



Albert Einstein “Intellectuals Solve problems, Geniuses Prevent them.”



... What if we could Prevent
Residual Subgingival Cement?

This has the potential to reduce
peri-implant disease and failure by 60%.

Thomas G Wilson Jr. The Positive Relationship Between Excess Cement and Peri-implant Disease: A Prospective Clinical Endoscopic Study. J. Periodont 2009;1388-1392

What Determined the Design of Margins for Replacement Teeth?

The design of margins had more to do with the properties of the materials and technology available.

Feather margin – soft gold at the thin margins was burnished towards the tooth retainers to form a seal.

Chamfer & Butt – responded to the needs of porcelain and the availability of the high speed.



The problem is – these margins direct cement into the tissues and completely ignore the effects of gingiva on cement flow. And ... older cements require high pressure cementation to minimize film thickness to compensate for their low compressive strength and solubility at the margins.

What do we understand about intra-oral cementation? It is a hydraulic event.*

Excess cement -

1. can be difficult to control**
2. can go deep into the subgingival spaces*, **
3. can be difficult to detect and remove**
4. is a risk factor for periodontitis and peri-implant disease***
5. can be removed by endoscopic means or after surgical access***



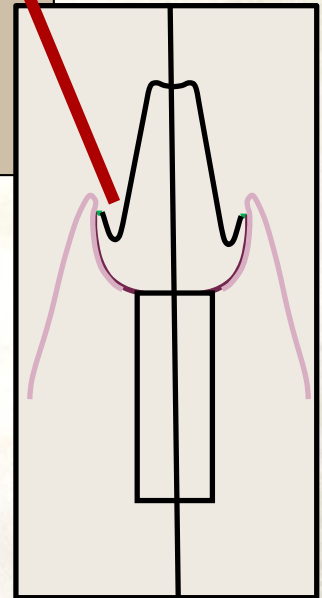
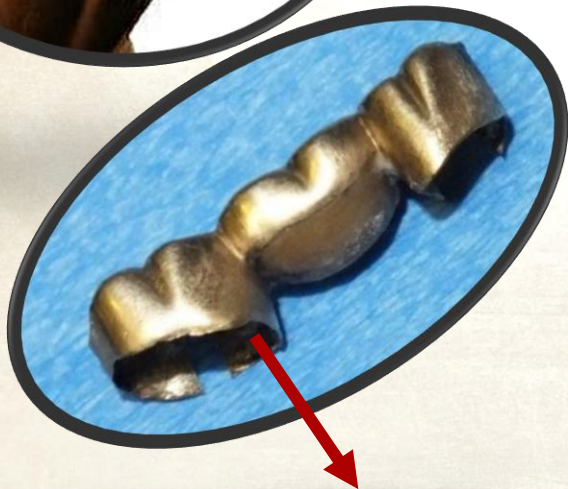
*Cementation in Dental Implantology. An Evidence Based Guide. Edited by Chandur P.K. Wadhvani. Published by Springer 2015. **The Influence of the cementation margin position on the amount of undetected cement. A prospective clinical study. Tomas Linkevicius et al. Clinical Oral Implants Research. Vol 24, Issue 1, 71-76, Jan 2013. ***Thomas G Wilson Jr. The Positive Relationship Between Excess Cement and Peri-implant Disease: A Prospective Clinical Endoscopic Study. J. Periodont 2009;1388-1392

1. Effect of Margin Design on Cement Flow



Margin Design Effects the Direction of Cement Flow!

Why would you ever choose to use Margin Designs that direct excess cement into the tissues again?



2. Gingival Effects Discovered!



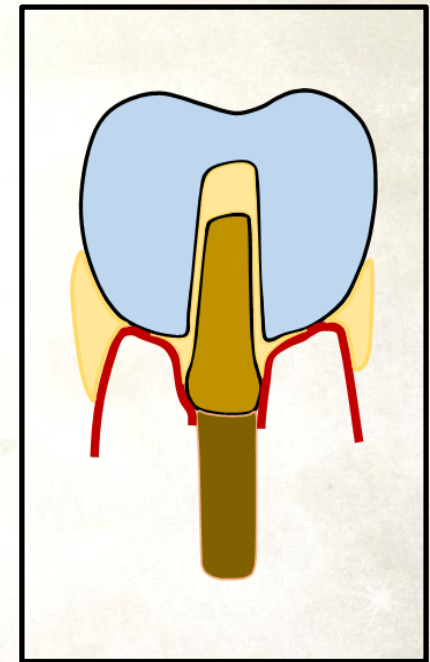
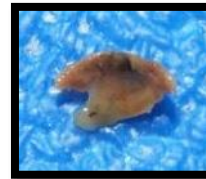
When “Gingiva” was present on the model – Excess Cement was still projected under the Gingiva, regardless of Margin Design!

“Gingival Effects” on Cement Flow



Regardless of Margin Design

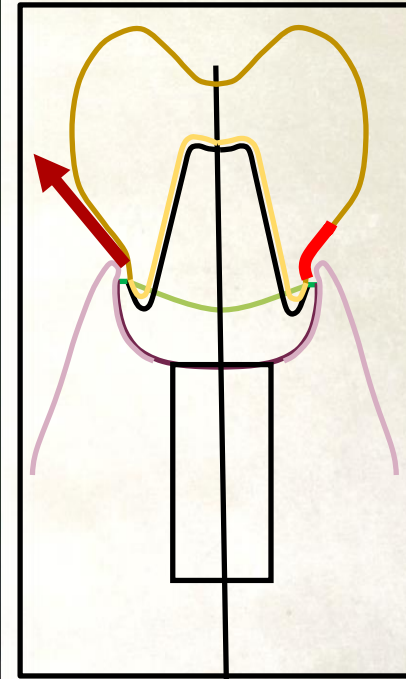
The Gingival Effects on Cement Flow are Huge!



The Gingival Effects include the Deflection Effect, Eddy Effect, Plunger Effect and Bellows Effect.

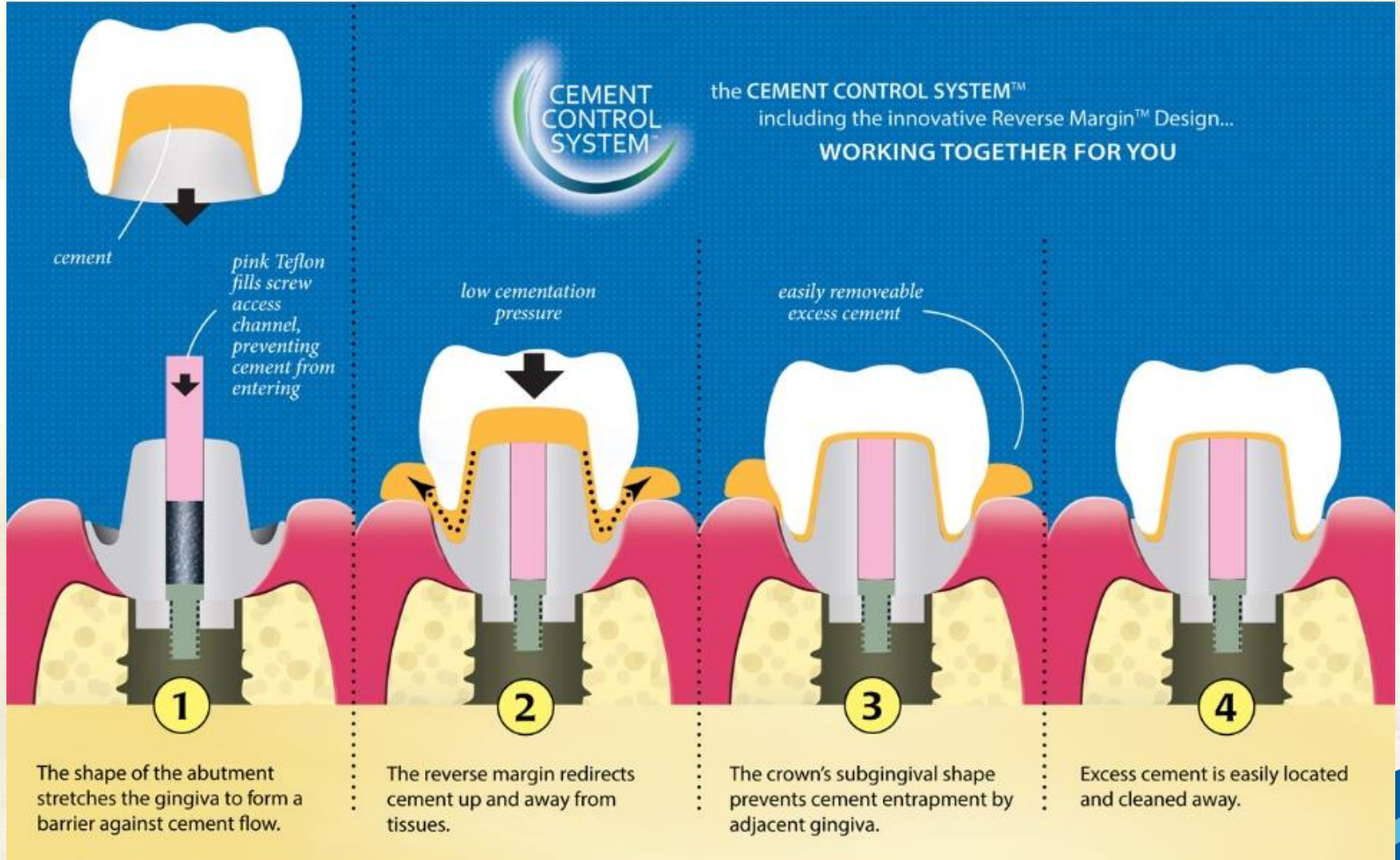
Controlling Excess Cement During The Process of Intra-oral Prosthesis Cementation: Overcoming the Gingival Effects. ELA Svoboda, OralHealth Oct 2015;52-66 and at www.ReverseMargin.com.

3. Overcoming the Gingival Effects



Crown Shape - External Cement Release

Cement Control System Preventing Mucositis!



What Does the Cement Control System Look Like?

Sterilization is possible!



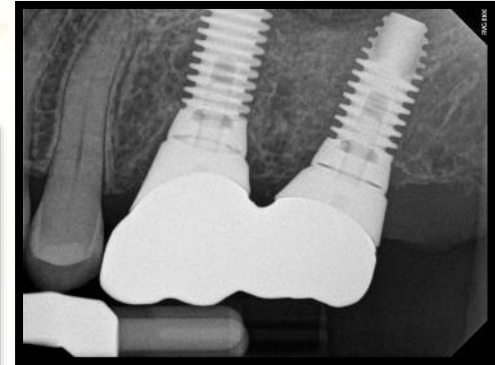
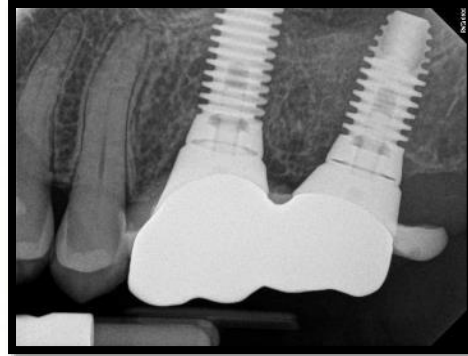
Hybrid Zirconia is possible!



Emil L.A. Svoboda PhD, DDS © 2016

Screw Versus Cement For Implant Prosthesis Installation. Part 2: The Game Changer that tips the balance in Favour of Intra-oral Cementation. Emil L.A. Svoboda, www.ReverseMargin.com, Update Jan 2, 2016

Optimize Abutments, Cement and Clean up



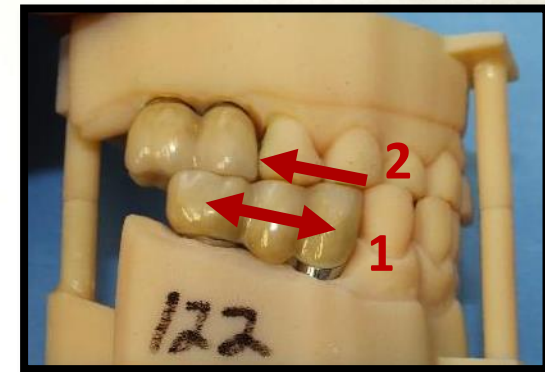
**Residual Excess Cement Problem Solved!
60% Reduction in Complications??**

Can We Apply this to Screw-in Prosthetics?

Their BIG Problem - they are Assembled on Models

Models are not accurate enough to prevent
Stress and Misfits

at the implant-abutment connection (1)
And tight contacts can add to this problem (2)



Why do Dentists like the Screw-in Technique?

1. Achieve Prosthesis Retrievability
2. Eliminate Cement Risk



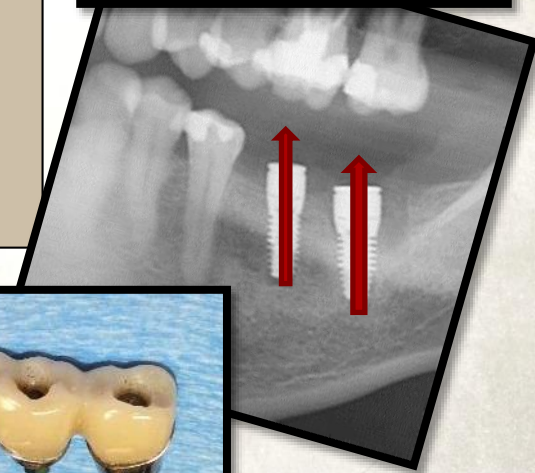
New!

Retrievability of a Prosthesis is not a function of installation method. It is result of “Retrievability Features”

1. A working path of insertion
2. A near parallel arrangement of dental implants
3. The use of special parts like multi-unit abutments that build some tolerance for slight implant misalignment
4. A favourable location of screw access hole

Dental Implant Prosthetics: Achieving Retrievability and Reducing Treatment Complications by using a Modified Installation Technique. Emil L.A. Svoboda.

www.ReverseMargin.com, March 29, 2016



AGD 2016 BOSTON
REVOLUTIONARY CHANGES IN DENTISTRY

Retrievability is Not Specific to Prosthesis Installation Technique!



Both of these
Prostheses
are Retrievable

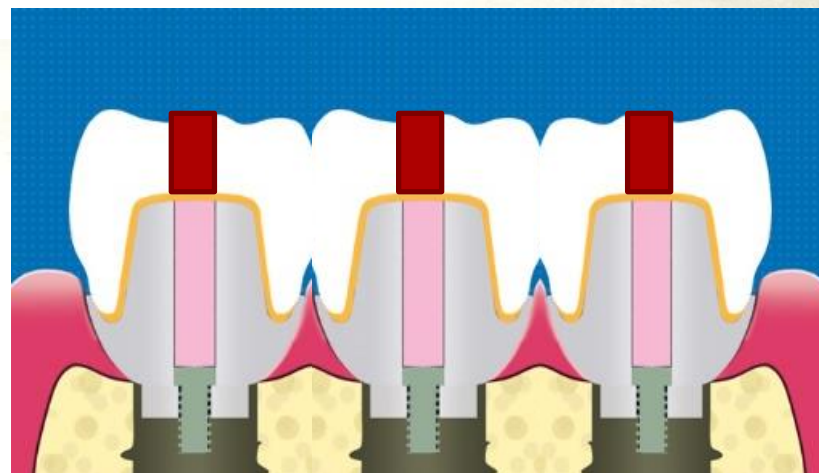


But Implant-Abutment Misfits are Created when the
Abutments and Prosthesis are Assembled on Inaccurate Models
and then Installed on Implants in the Mouth

Retrievability Features Already in Place

Svoboda Modification Assembled in the Mouth!

1. Lab delivers abutments and prosthesis separately
2. Access holes are sealed with acrylic plugs
3. Dentist installs abutments individually to optimize their implant-abutment fit
4. Access channels are filled with Teflon plugs
5. The prosthesis is cemented in the mouth
6. Excess cement is removed, as well as possible
7. The access holes are drilled out
8. Prosthesis is taken out of the mouth
9. Any Remaining Excess cement removed
10. Assembled Prosthesis is screwed into place
11. Teflon plugs are reinstalled
12. Acrylic plugs are remade
13. Occlusion is adjusted

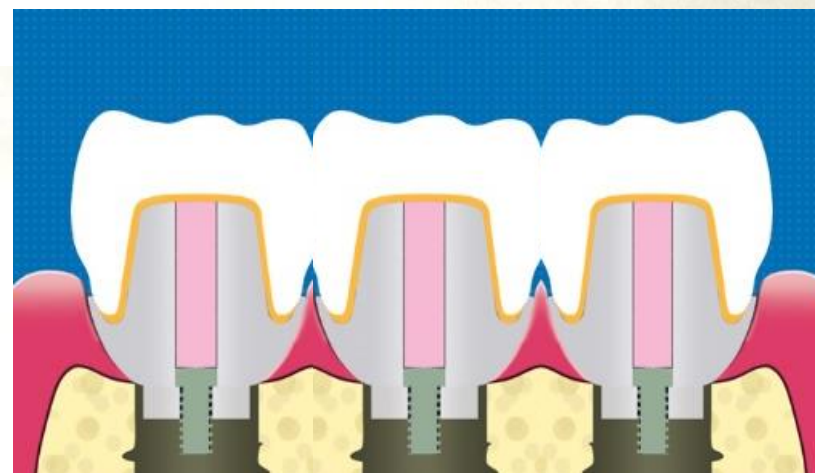


Optimized Implant-Abutment Connection
Excess Cement Removed Effectively
(This does not need custom abutments!)

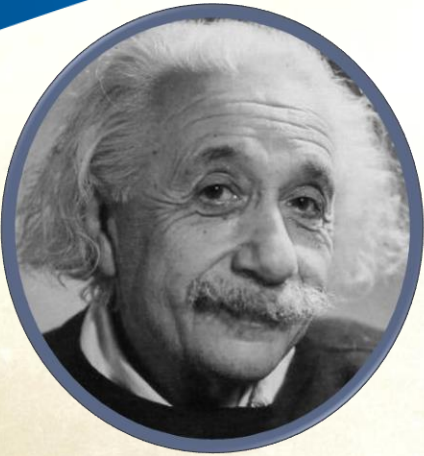
Retrievability Features in Place

Simplified Svoboda Modification (Reduces steps)

1. Lab delivers abutments and prosthesis separately (Sterilized)
2. Access holes are sealed with acrylic plugs
- 3. Dentist installs abutments individually to optimize their implant-abutment fit**
- 4. Access channels are filled with Teflon plugs**
- 5. The prosthesis is cemented into the mouth**
- 6. Excess cement is removed, as well as possible**
7. The access holes are drilled out
8. Prosthesis is taken out of the mouth
9. Excess cement removed and voids filled
10. Assembled Prosthesis is screwed into place
11. Teflon plugs are reinstalled
12. Acrylic plugs are remade
- 13. Occlusion is adjusted**



Assembled in Mouth
Optimized Implant-Abutment Connection
Excess Cement Removed Effectively
Needs Cement Control System Features



Prevent Misfits at the Implant-Abutment Connection by Intra-oral Assembly



Prevent Complications for Retrievable Prosthetics



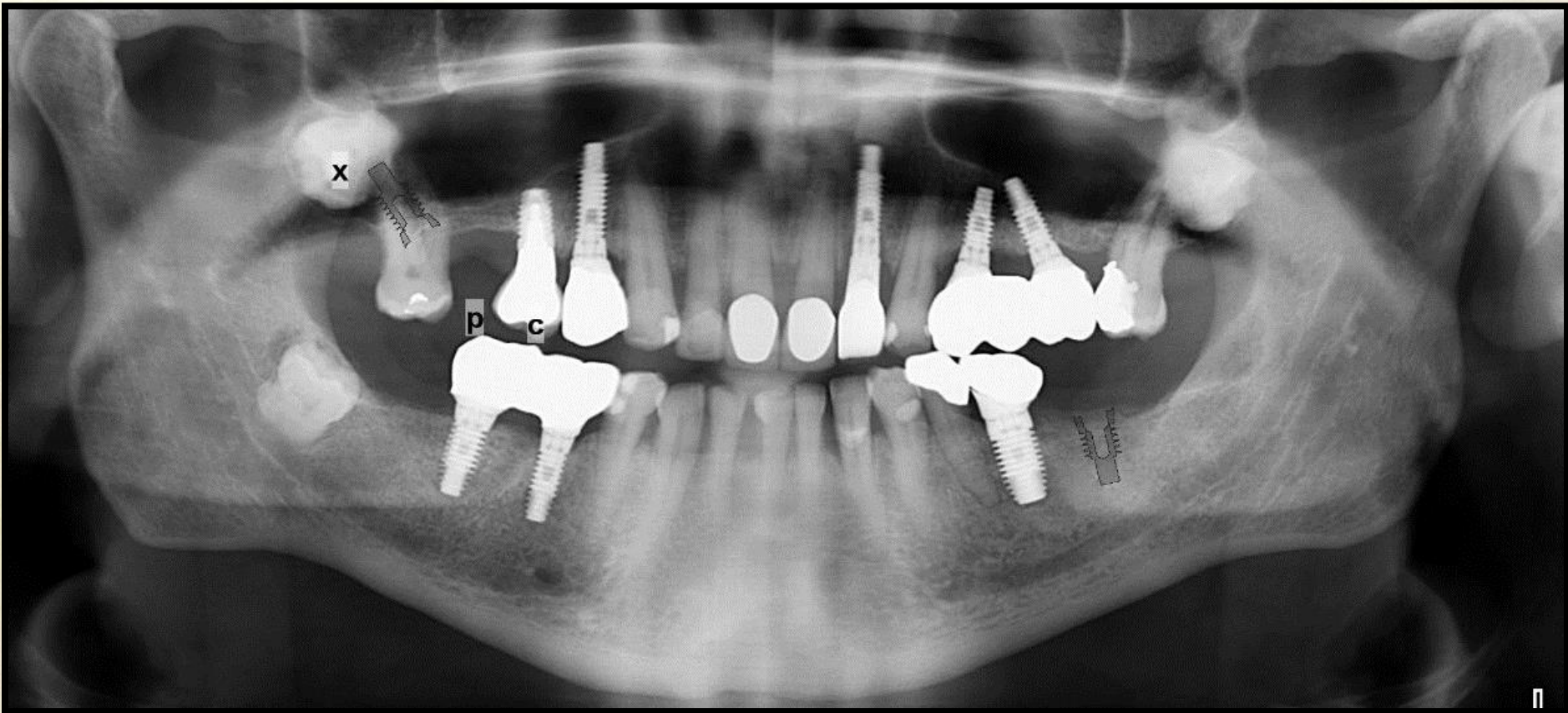
But Wait! Retrievability is Not Free!



- it may involve the use of guided implant surgery to align implants \$\$
- It may require site development procedures like additional grafting to align implants inside a bony architecture \$\$\$\$
- It may require expensive additional parts and lab work \$\$
- It may require the creation of cantilevers that are difficult to maintain, are mechanically unstable and create space for oral pathogens \$\$\$\$

Retrievability Features Can Add Risk and Cost to Treatment

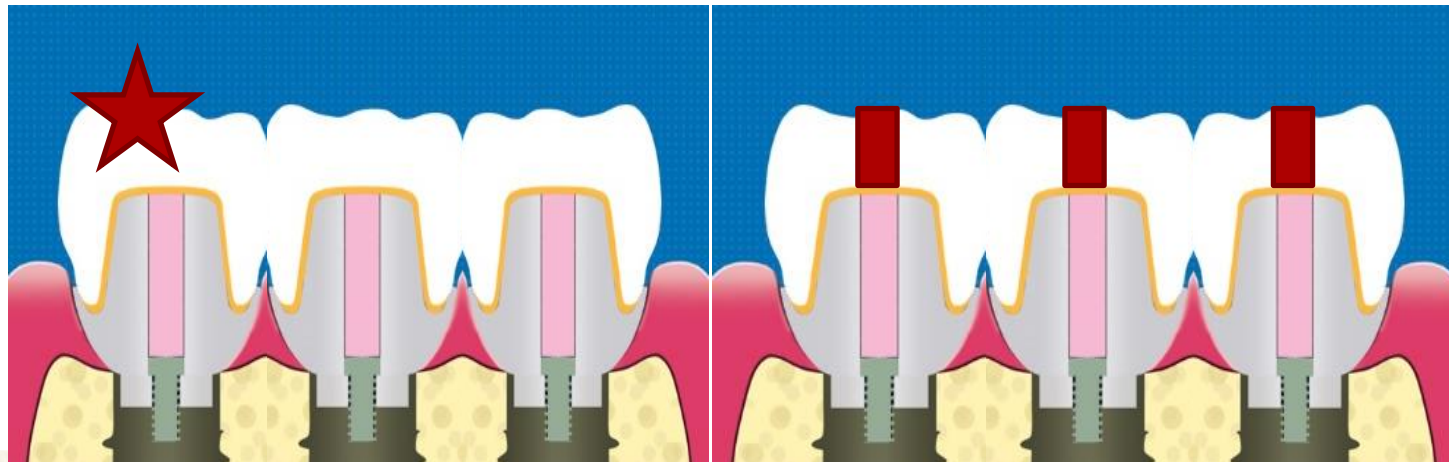
Avoid the need for lateral sinus graft



In Summary

**Retrievability is not Dependent on Installation Technique
and it is Not Free.**

**Now Dentists can Prevent More
Iatrogenic Treatment Complications!**



**Less Complications ... Happier Dentists and Patients More
Implants 😊**

Contact Me at
DrSvoboda@rogers.com



www.ReverseMargin.com for more information.

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