



WHAT WOULD
YOU DO?

ONE vs TWO ?

CANTILEVER APPROACH TO ANTERIOR IMPLANT THERAPY

A CASE REVIEW

HOW MANY IMPLANTS ARE NECESSARY?

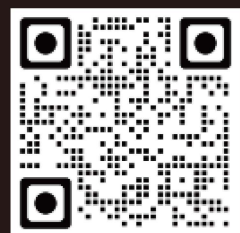
M A R K K W O N , D M D

For so long we have been searching for the optimal treatment option for anterior missing dentition. There is a saying, “patients do not want implants... they want teeth...” However, when it comes to anterior teeth replacement, “patients do not just want teeth... they want a smile...” Needless to say, still to this day, maxillary anterior teeth replacement is considered one of the most challenging dental procedures. What is more challenging than replacing a single missing anterior tooth? How about replacing TWO missing anterior teeth side-by-side, which are ankylosed with an uneven gingival level and suffering from internal root resorption? (Fig.1) One of the key difference between a posterior implant versus an anterior implant is the patient’s expectation on the esthetic outcome. In this article, I will present an interesting case, where I deliberately chose to place a cantilever implant rather than two individual implants. I will go over my thought process of WHY, HOW and WHAT from treatment planning to execution in order to achieve a successful Cantilever anterior bridge outcome.

HOW WOULD YOU TREAT THIS CASE?



Fig. 1 : Ankylosed #22, #23 with internal root resorption.



QR video clip:
“Introduction to
cantilever approach
to implant therapy”

“The ultimate goal of dentistry...is to regain form and function in a minimally invasive manner without irreversibly damaging the surrounding biological architecture ...”



Fig. 2 : Failing #22,23 (Internal root-resorption with ankylosis). Hard and soft tissue deficiency expected

Subject: 32-year-old healthy Caucasian female
cc: “my upper front two teeth are failing, and my dentist told me that they are not saveable”
Hx: Childhood trauma to maxillary anterior teeth
Dx: Internal root resorption #22,23 (ankylosed roots) (Fig. 2)

If this were your patient, what would you do? What are the treatment options? 4-unit fixed bridge or extraction and placement of two implants? Which option would give the best long-term aesthetic outcome? There is obviously more than one way to treat this case.

TX. OPTIONS: Pros & Cons

1. Luxation-orthodontic extrusion: This is tough to do on teeth that are already ankylosed. Due to the severity of the internal root-resorption, there is high chance of crown fracture during the extraction procedure.
2. Extraction of #22,23 and conventional bridge #21-x-x-#24: This may be the quickest and simplest way to deal with this case. However, sacrificing two adjacent virgin teeth to gain two pontics does not seem like a good trade-off.
3. Extraction of #22,23, bone graft, followed by placement of implants at #22,23 4 months later: Although this was my initial choice, I also knew that regenerating bone and soft tissue in-between the two implants could be unpredictable.

STARTING WITH THE END IN MIND ...

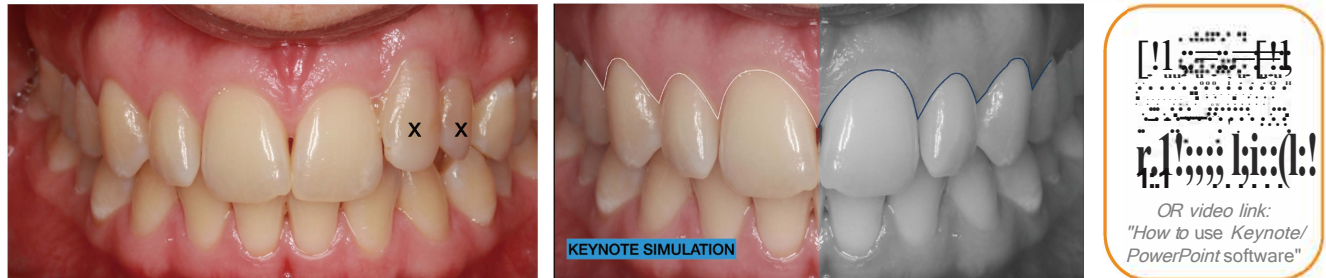


Fig. 3: Simple digital mock-up using Keynote (or Powerpoint) software

First Step: 'Starting with the End in mind'

My first step was to simulate the "ideal" outcome before the starting the surgical phase. In this case, I used a very simple method of mirroring the right side of the patient's dentition using the Mac KEYNOTE software. (Fig. 3)

Treatment objectives and limitations:

The main objective was to achieve the optimal aesthetic outcome. This was particularly challenging due to the already-compromised remaining bony architecture and soft tissue level. No matter what I did, I knew that it would be almost impossible to regain a sufficient bone and tissue level to achieve "the ideal final outcome" I had simulated. For such aesthetically-driven treatment, I believe that it is very important to inform the patient of the reality of a compromised outcome BEFORE I begin the treatment procedures.

PLANNING PHASE:

After discussion all the abovementioned options, we decided on the following treatment plan:

Phase one: Extraction and GBR (Guided Bone Regeneration) using the traditional 'Sausage-Grafting' technique: PRF, sticky bone, collagen membrane, and bone tacks. The temporization involved a fixed-bonded Maryland bridge. (Fig.4)

Phase two: After 5 months of healing, a CBCT was taken to assess the amount of bone regeneration. (Fig. 5)

Phase Three: Guided surgery using R2GATE. Instead of placing two implants at #22,23, we decided to place one implant at the #23 (canine) site and cantilever the pontic at the #22 (lateral incisor) site. (Fig. 6) The main reason for this controversial decision was to optimize the tissue morphology and create the 'illusion' of inter-proximal papillae.



Fig. 4: A bonded Maryland bridge can be a good option for a fixed immediate provisionalization

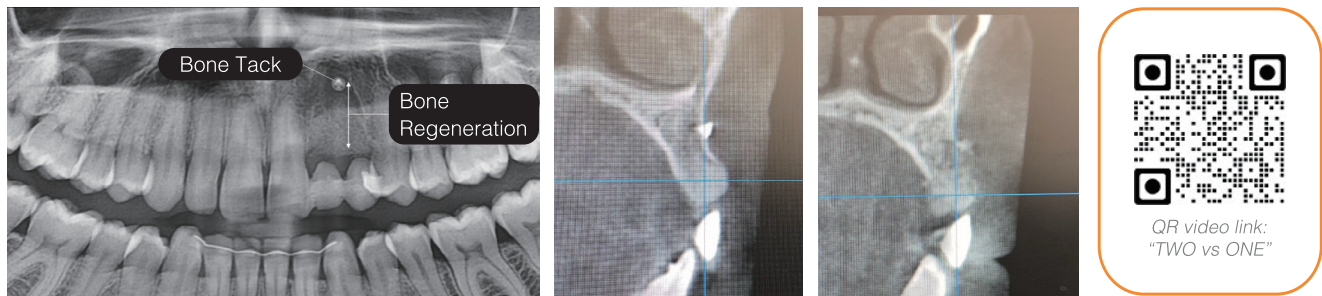


Fig. 5: 5 months post op GBR: CBCT reveals adequate bone regeneration both vertically and horizontally.

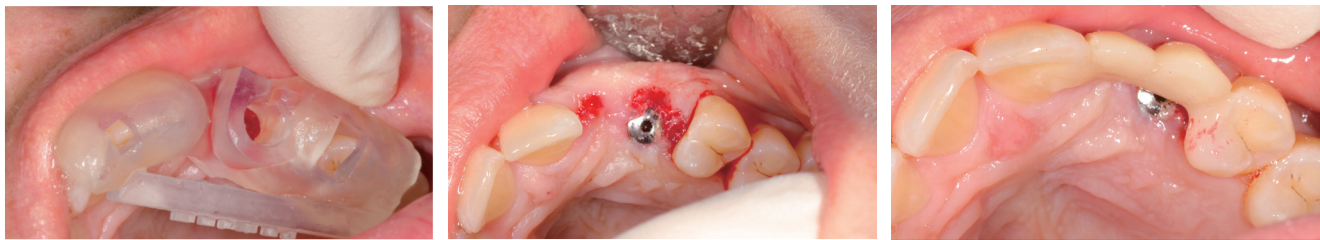


Fig. 6: Guided surgery (R2GATE) was used to place the implant at the #23 (canine) site. The bonded Maryland bridge was used for the provisionalization

Flap vs Flapless: Although I rarely do flapless surgeries, this was an exception, and I decided to go flapless to minimize the disruption to the soft tissue and underlying bone that were not fully mature at this time. The bonded Maryland bridge was reused to provide fixed temporization of the edentulous site.

Phase Four: After another 4 months of implant integration, we were ready for the prosthetic phase. A small FOV CBCT was taken to verify the surrounding bone level. (Fig.7) One of the most crucial parts of this phase is the fabrication of a fixed provisional bridge before the final prosthesis. (Fig.8)

A chair-side fixed provisional bridge was fabricated using a stock temporary abutment, putty template, and self-curing PMMA material (e.g. Voco). The patient was instructed to eat a soft diet for 6 weeks and resume normal home hygiene care, including the use of super-floss. During the six-week provisional stage, we monitored the tissue response (i.e. inter proximal papillae formation), home hygiene, speech, and function. At this stage, it is imperative that the patient and clinician are both satisfied with the aesthetics of the provisional bridge. If there are any changes that need to be made, they must be made during the provisional stage. Trying to correct deficiencies in the final prosthetic stage can lead to more complications.



Fig. 7: 4 months after the implant placement, a CBCT was taken to verify the surrounding bony architecture



Fig. 8: Fabricating a good fixed implant-level provisional prosthesis is a vital part of a successful outcome



Fig. 9: Impression taken using PVS with flowable composite. A custom shade is selected and sent to the lab. A custom-milled abutment is used to support the cantilever bridge

BIOLOGICALLY-DRIVEN PROSTHETIC PHASE

Phase Five: Final prosthesis fabrication

The final impression was taken using a custom-impression technique. (Fig. 9) This ensured the soft-tissue profile was captured for the lab procedure. The temporary bridge was also scanned using an intraoral scanner (10S) and the STL file was sent to the lab. The shade was also determined during this appointment. (Fig. 9) All this information helps the lab to fabricate the final prosthesis that will closely resemble the provisional prosthesis. In short, good fixed provisional prosthetics will lead to good final prosthetics. (Fig. 9) The custom abutment was torqued at 35n.cm (Fig. 10) and the final PFZ (porcelain fused to zirconia) cantilever bridge was delivered using Rely-X resin cement. (Fig. 11) The adjacent occlusion was checked carefully to ensure exclusion of the lateral incisor pontic.



Fig. 10: Custom abutment torqued at 35n.cm



Fig. 11: Delivery of final bridge x-23 using Rely-X resin cement

‘STARTING WITH THE END IN MIND’



Fig 12: Very important to create ideal emergence profile including ample amount of embrasure space to maintain inter proximal papillae



Fig 13: EXOCAD performing merger of pre-surgical prosthetic design to implant positions



Fig 14: Provisional bridge is milled from solid PMMA puck (Telio) overnight

Final Thoughts

Due to the high aesthetic demands, anterior implant therapy is considered one of the most challenging treatments in the field of implant dentistry. Among anterior therapies, side-by-side implant therapy poses additional challenges due to the frequency of unpredictable soft-tissue outcomes. Thus, many aspects must be considered when formulating an ‘aesthetically-driven’ treatment plan. A relatively under-utilized approach is cantilevering implants. While perhaps controversial, with careful planning and execution, this “less-used” approach can oftentimes result in a more predictable aesthetic outcome than with a conventional approach.



Implantologist
Bites Institute Implant Training Centre,
Vancouver, BC

Contact

Dr. Mark Kwon

Clinic name: Chrysalis Dental Centre

Address: 500-7300 Edmonds Street Burnaby B.C. V3N 0G8
Canada

E-mail: info@bitesinstitute.com

Facebook: BGIN (Bites Global Implant Network)