The Dentist's Guide to Atraumatic Extractions

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The Dentist's Guide to Atraumatic Extractions

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Contents

Preface

This book is for general practitioners, periodontists, oral surgeons, endodontists, pediatric dentists, and prosthodontists interested in improving their extraction technique and their ability to preserve bone following extraction. It is the culmination of having placed more than 5,000 implants, mostly one at a time. Many of these procedures involved a prior extraction.

In the early 1990s, when dental implants were becoming recognized as a viable option for tooth replacement, most patients presented with the tooth removed already. The result was a large ridge defect that required guided bone regeneration (GBR) before implant placement. I asked myself: Are we extracting teeth or bone? Because the bone was being removed in order to facilitate tooth removal. It just didn't make sense to me that for the sake of extracting teeth as quickly as possible, bone was being sacrificed.

I thought, why not remove tooth structure—which will be removed anyway—to make space for tooth removal, instead of removing bone to make space for tooth removal? I am not extracting bone, am I? Because bone is difficult to replace.

My hope and goal is to pass on these techniques to the dental profession to reduce our patients' postoperative discomfort, to maintain the residual ridges, and to help improve final outcomes. Enjoy!

Acknowledgments

I would like to thank my parents—William G. Mason, MD, and Suzanne T. Mason—for creating a loving family environment and instilling a work ethic with expectations. Also, my mentors Billy Smith, DDS, MS, and Frank Rugani, DDS, were instrumental in my early years of practice. They embodied professionalism and excellence in dentistry and served as models for me. My grandfather, William J.B. Mason, DDS, provided my first exposure to dentistry, which proved to be both a positive and lasting one.

I would like to thank my wonderful wife, Ann, for her patience and support. She not only gives me space to pursue my projects and passions but also offers feedback and encouragement along the way.

I am fortunate to be a member of the Dean's Faculty at the University of Michigan School of Dentistry, teaching monthly in the Graduate Periodontics Clinic. I want to thank Dr Hom-Lay Wang, Dr Will Giannobile, and Dr Laurie McCauley for inviting me to contribute to the education of the residents. I am truly honored to have that privilege and to be continually inspired by all of the leaders at the school, as well as the residents.

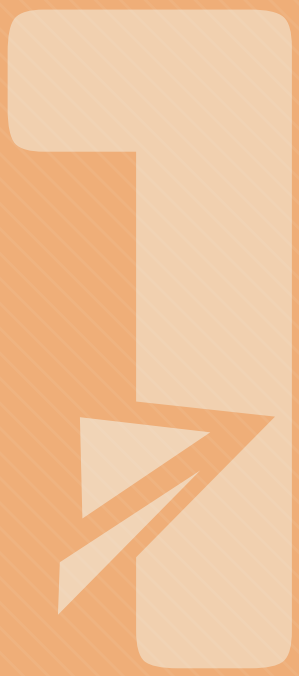
I would like to thank my daughters—Dr Chelsea Mason, a general dentist, and Dr Suzanne Mason-Dennis, a periodontist—for motivating me to keep abreast of the latest developments in dentistry. They are inspirational and represent the exceptional young practitioners in our profession.

Also, this book would have been much more difficult to complete without my photography assistant, Sophie McConnell. She stepped up when needed—always with a smile on her face. In addition, Kristina Fanning was my go-to person for organizing and transmitting the transcript and photographs. I truly appreciate her technical skills and patience.

I would like to thank my referring doctors and their patients for allowing me to participate in their care. Without them, these ideas would not have come to be.

Finally, the amazing and wonderful staff at Quintessence Publishing—Bryn Grisham, Director of Book Publications, and Leah Huffman, Editorial & Marketing Director—were kind enough to show interest in this topic, accept my manuscript and photographs, and bring it to fruition. I am truly grateful for this opportunity to share these ideas.

Thank you all.



Introduction

My Story

"*Frank, I'm not interested in doing implants; I'm a periodontist! That's for the oral surgeons.*" It was 1989, and I had been a practicing periodontist for 5 years. Dr Frank Rugani was a referring dentist who was involved in restoring dental implants. I was not interested in placing dental implants. Dental implants were not included in any periodontal residency at the time, and I had not been trained to place them—only oral surgeons were placing them at that time. But Dr Rugani was very persuasive. He needed a surgical colleague to work with, and I was coerced into spending 3 days at Northwestern Dental School in Chicago at my first Brånemark dental implant training.

Flash forward to 2022, and dental implants make up about 70% of my practice. I have placed over 5,000 dental implants, and the majority of these cases were single tooth extractions with implant placement. Tooth removal has become a big part of my clinical practice.

In the 1990s—the early days of dental implants—my referring dentists would refer patients to me with the tooth or teeth already removed and the ridge already resorbed. For partially edentulous patients or cases with single-tooth replacement, I would have to augment the resorbed ridge, wait 6 months, place the implant, wait another 4 to 6 months, and then uncover and refer the patient back for restoration. Of course as a periodontist I was trained to *save* teeth, not extract them, but as I began to place dental implants, I had to learn how to remove nonrestorable, broken-down teeth—tough extractions for me. I was humbled many, many times, and still am. Over the last 30 years, however, I have developed ways to remove teeth carefully, without raising flaps. Preservation of the bone and its architecture is my priority, along with a gentle technique.

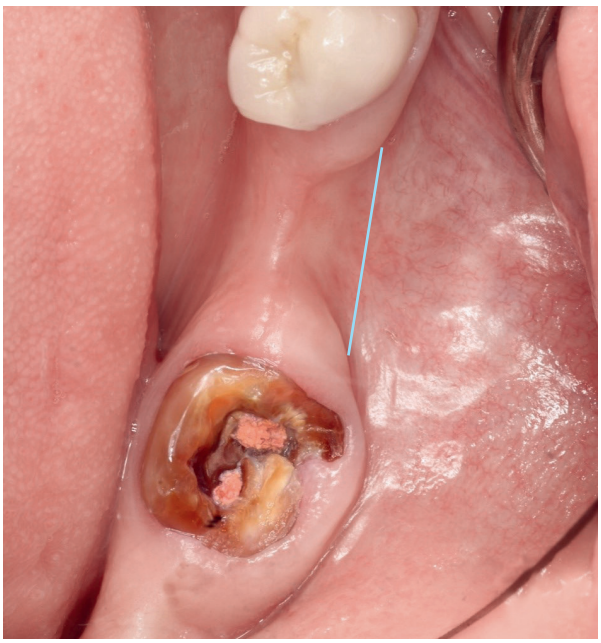


FIG 1-1 Resultant severe vertical and horizontal ridge resorption after extraction of tooth #30, with bone removal to access the roots and without socket preservation. The *blue line* represents the location of the alveolar ridge when tooth #30 was present.

Figure 1-1 shows what I am trying to prevent. But this is what happens when you extract teeth the way you're taught in dental school—with the elevation of full-thickness flap, bone relief, expansion of the sockets, and the use of elevators and forceps. This always results in ridge resorption laterally and vertically; this ridge shrinkage occurs within the first 3 months of healing and is most evident on the buccal.

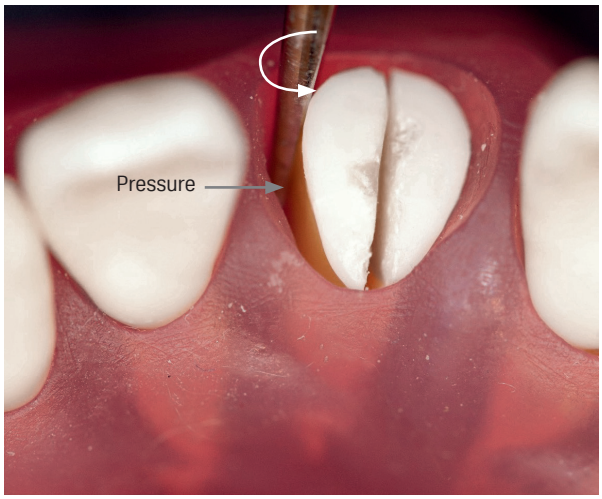


FIG 1-2 Thin elevator inserted into the sulcus and used with a gentle twisting motion to pressure the sectioned root into the created space.

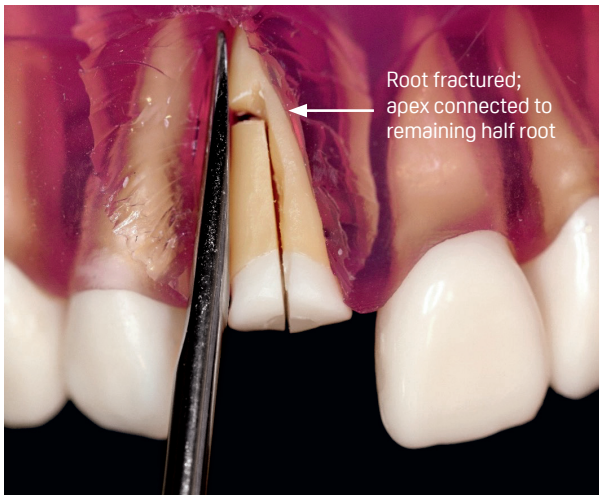


FIG 1-3 Sectioned root fractured during removal because sectioning did not extend all the way to the apex.

And that is why socket preservation is so important. Tooth extraction without socket preservation can lead to food impaction under a fixed restoration, inadequate ridge width for dental implants, thicker flanges on partial or complete dentures, and potential loss of facial support. Atraumatic extraction with socket preservation prevents all this and protects the jaw's original anatomy.

I have noticed that a great deal of research and literature is focused on socket preservation *after* extraction. But the extraction procedure itself has just as much to do with the potential of the socket to be preserved and to heal.[1–5] Many articles and lectures begin their discussion with an empty socket. But what about the trauma caused by the extraction? How long was the extraction procedure? The degree of trauma during the extraction directly affects the postextraction healing.[1,2,4–6]

I am concerned with preservation of the buccal plate. If the buccal plate is damaged, collapse of the socket will occur, mostly from the buccal. Resorption of the buccal plate reduces the arch width and circumference, which can compromise future implant placement because it affects implant positioning and often results in the need for a restorative cantilever.

Dental extractions aren't easy. In fact, they are one of the most difficult and humbling procedures in dentistry. Some of this difficulty is undoubtedly due to the unpredictability of the procedure. Teeth with existing resorption are often ankylosed. Because it is difficult to diagnose ankylosed roots, I always assume that any tooth with resorption is at least partially ankylosed.

Most oral surgery textbooks recommend extraction via large full-thickness buccal and possibly lingual flaps with bone relief.[1,2] Sometimes mesial, distal, and lingual bone relief are also recommended to gain access to the root, followed by luxation and elevation to remove it. These techniques remove teeth fairly quickly, but the long-term effects on ridge resorption can be devastating.

Let me be clear that I do not have a big secret or magic bullet for atraumatic extraction. Instead I have curated many small secrets and tips that together result in a very comfortable, atraumatic, and ridge-preserving experience for the extraction patient. I call this technique the *atraumatic extraction technique* (*AET*). The goal of the AET is to preserve the patient's original jaw anatomy as much as possible and therefore preserve their facial structure.

Root Space Creation Extraction Technique

One of the major components of the AET is the root space creation extraction technique (RSCET). With this technique, root structure is removed to allow space for the remaining tooth structure to be pressured into prior to its removal, thereby preventing the need for bone removal and protecting the socket from deformation.

Why not remove tooth structure that will already be removed instead of removing bone to make the space needed to extract the tooth? Bone is difficult to replace once it's gone, but the tooth is coming out anyway, so it can be sacrificed during the extraction process.

Also, removing bone between the roots of multirooted teeth to allow space for further root and tooth removal is not as damaging as removing socket wall bone for the same ends.[7] Bone removed between roots will regenerate as the socket heals, but socket wall bone will heal by resorbing toward the center of ridge, resulting in a narrower ridge.[7]

Roots can be more easily removed when the periodontal ligament is severed and a space is created to move the root into. Prying a root out only increases the risk of root fracture and damage to the socket wall.[8,9] The RSCET therefore entails vertical sectioning of the root. When you remove some root structure vertically all the way through the apex, you can push the root laterally into this space (Fig 1-2), thereby facilitating removal without damaging the socket wall or alveolar ridge. If one vertical cut is not adequate to allow lateral movement of the root, then the root should be cut into four pieces with two vertical cuts at 90 degrees to each other.

When sectioning the root vertically, it is important to cut entirely through the apex; otherwise, when you apply pressure between the roots laterally, you may fracture the root above the apex, leaving the apex connected to one of the root pieces (Fig 1-3). If this occurs, sectioning should continue all the way through the apex, and the root remnant can be removed along with the other half of the root.

The rest of this book covers the basic AET, which includes the RSCET. These techniques can be applied to all extraction situations. However, each area of the mouth has specific characteristics that must be considered to help prevent extractions from becoming an exercise in frustration. After all, when extractions become excessively time-consuming, poor healing and complications result.[1] As such, subsequent chapters address specific teeth and areas of the mouth to maximize success with the AET and RSCET.

Conclusion

Extractions can be very traumatic and damaging to the oral anatomy. Forceps are designed to luxate teeth either by rotation or buccolingual movement, which can damage the buccal, lingual, mesial, and distal socket walls. Elevators use lateral leverage and wedging forces, causing trauma to hard and soft tissues.

If a traumatic extraction occurs, the result is resorption of the buccal and lingual bony walls, restriction of blood supply, and increased inflammation.[2,3,5] Without socket preservation, there is an average of 4.5 mm of horizontal bone resorption and 1.5 mm of vertical bone resorption within the first 6 months.[3,10–12]

After extraction, the buccal ridge exhibits more resorption than the lingual ridge.[7] This can influence implant placement, shifting the implant position more lingual and therefore requiring a restoration with a buccal cantilever or an inadequate occlusal table.

This is why an atraumatic extraction technique with socket preservation is so important—because it helps reduce buccal ridge resorption and thereby protects the patient's original jaw anatomy and facial structure. This book will show you how.

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