More dentists and patients are becoming aware of receding gum tissue. What is this all about? How does it start? Why is gum recession a problem? Can recession be prevented? Can recession be reversed and repaired? What are the different types of treatment for gum recession?

Since the management of gum recession is evolving yearly with attempts with different styles and treatment techniques, we’d like to provide a knowledge base that can allow you to understand the rationale of our approach of treatment. We will acknowledge that since treating and preventing gum recession is a significant part of our practice, we have refined our techniques to a degree that our approach can vary from standard treatment approaches provided by many talented and competent periodontists.

To Understand Recession, Let’s Understand Normal

Without getting too academic about it, we’d like to define the problem a little more closely. The story really starts by trying to understand what a normal, healthy mouth looks like.

**Gingiva**
The healthy unaffected dentition is one where there are two types of surface tissue that cover the bone that encases the teeth. Look at a healthy mouth and there should be at least some firm, pink gum tissue right at the gum line. This pink tissue is called gingiva. Many people have heard of “gingivitis” which is simply inflammation of the gingiva. While there have been many long and boring arguments between periodontists about how much (how wide) the gingiva should be, most specialists agree there should be some gingiva. Many periodontists feel that there should be a minimum of 2 millimeters of gingiva at the gum line. The gingiva is a firm, stable tissue that is covered with a skin material called keratin that has body to it. This surface toughness can help prevent the gums from tearing or receding though a lifetime of chewing, talking, and tooth brushing. We usually go with the 2 mm. recommendation, though we often like to see a little more since the first one or two millimeters of gum tissue are not often attached to the tooth root. Instead the gingiva hovers over a gap or sulcus that is a normal groove between teeth and gums.

**Alveolar mucosa (“mucosa”)**
As one begins to move away from the gum line, going away from the crown of the tooth, the surface tissue changes and becomes a thinner (and therefore redder) tissue that has natural elastic elements in it to make it very flexible. This tissue is called alveolar mucosa (or “mucosa”). Its flexibility allows the mouth to move so one can eat, talk, etc. This surface tissue is called alveolar mucosa which lines the cheeks, floor of the mouth, inner lip and extends all the way around the mouth except for the pink gingiva around teeth, on the roof of the mouth (palate) and the taste buds on the top of the tongue.
Gum Position in Health

If there is adequate pink gingiva around the tooth and if there are no other conditions that challenge its integrity such as excessive tooth brushing, tobacco use, gum inflammation (gum disease) or irregular tooth position, the gum line can stay at its natural position for a lifetime. Even with aging, one does not need to have recession or be “long-in-the-tooth”.

Periodontal (Gum & Bone) Recession

When circumstances cause thinning or irritation to the gums, they can get either worn away and degenerate if the blood supply to the gum line becomes compromised. This can also occur as a consequence of inflammatory gum disease called periodontitis.

Whether by inflammation, irritation, or other causes, the gums can break down and expose the root of the tooth. The tooth root has a different makeup than the top or crown of the tooth. While the top of the tooth which we’re used to seeing is covered with a highly calcified dental enamel, the root is much softer and is covered with a thin layer of less calcified structure called cementum under which is the body of the tooth root made of dentin. Again, dentin is much softer than the enamel that covers the crown of the tooth.

As the tissues descend along the root surface giving the appearance of receding gums, the bone around the tooth that holds the tooth in place is descending along with the gum tissue. This tells us that it’s not just the gum that is receding, but the bone holding the tooth in place is receding too. Since gum recession can signify loss of both gums (gingiva) and bone, instead of the technical name gingival or gum recession, we call the process “periodontal recession”. This is consistent with the difference between gingivitis and periodontitis. Gingivitis is inflammation of the gum tissue only, but periodontitis describes inflammation of the gums (gingiva) and bone.
What’s to worry about if the recession is hidden from view? Recession risks for tooth health.

Gum recession is unsightly and can make someone look older than they are. But our main concern about gum recession starts with the threat to the teeth presented by periodontal recession.

**Treating Recession is About Saving Teeth**

As mentioned earlier, our first concern is protection of the supporting bone around the teeth. While it is rare to lose a tooth solely to recession, the loss of tissue around the tooth can open door to other problems that can threaten a tooth.

**Receding gums means receding bone**

While some see recession as just a gum problem, what often is not recognized is the loss of tooth-supporting bone that is lost along with the overlying gum tissue. When the tooth root becomes exposed as a result of recession that also means the bone and ligament that attaches the tooth to the bone are destroyed as well. Preventing and repairing recession protects supporting bone. This is especially important for teeth with short roots.

**Recession complicates oral hygiene**

When periodontal recession occurs, more tooth surface is exposed. This increased tooth surface attracts more quantities soft daily buildup of bacterial plaque, often creates an difficult to clean irregular gum line, and sometimes locates the gum line where it is harder to see and even harder to reach with a toothbrush. Increased plaque and accompanying difficulty in daily plaque removal can lead to complications from increased inflammation of the tissues (gingivitis and tooth threatening periodontitis), root sensitivity, and root decay.

**Increased risk of root sensitivity**

Most people who develop gum recession have no symptoms and first learn about it from the dentist or dental hygienist. Some people, however, “feel” the recession through increased sensitivity to temperature or touch (particularly when touched with any metal object like a fork or dental instrument). The reason for increased sensitivity with periodontal recession is exposure of the root surface which does not have the same calcified protection of its surface as does dental enamel. There are microscopic tubules in the root that are connected to the nerve of the tooth that easily transmit irritation such as cold or touch to the nerve creating sensitivity.

**Root decay**

When roots have their protective covering of gums and bone, decay cannot occur. However, if periodontal recession occurs as a result of disease, abrasion, or other cause, the exposed roots are put at risk for root decay. Since the root surface is not nearly as hard and dense as its enamel neighbor, decay can occur if the root surface starts to decalcify when exposed to the acidic by-products of bacterial plaque. This threat increases as salivary flow slows, and can be even worse when common medications such as those used to control hypertension (high blood pressure) and depression are taken. These drugs that can cause dry mouth, decrease the natural rinsing and antibacterial effects of saliva. As a result, we would like to see periodontal recession avoided or corrected if it has already occurred.

**Risk more recession**

If the factors that have caused some recession on a tooth have not been treated or otherwise addressed, the possibility of additional recession exists.

**Special risk for teeth with short roots**

Regardless of the size of the tooth above the gum line (tooth crown), the roots of the teeth that anchor the tooth to bone come in many different sizes and shapes. People with long tooth roots would have to lose more bone than someone with short rooted teeth to significantly weaken the support around teeth. Consequently, even modest periodontal recession could threaten teeth which have short roots.

**Unattractive appearance of longer teeth**

For some people, the most significant personal effect of periodontal recession is its unsightly appearance. Even small amounts of recession can create an unattractive appearance suggestive of increased aging (“long-in-the-tooth”). Receding gums can create a confidence weakening self-consciousness that inhibits smiling in front of others or causes one to cover his or her mouth when speaking with others to prevent exposure of the receding gums.

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Yes, there is good news. Periodontal recession can often be treated and reversed!

Covering exposed tooth roots is done through gum grafting known at Periodontal Plastic Surgery

Some of our techniques and research are quite new and may not yet available on standard Internet searches

Procedures focus on being “minimally invasive” sometimes using a microscope, tiny sutures (stitches) with great emphasis on comfort

We are sincere about comfort: Comfy chairs, blankets, buckwheat pillows, “movie” goggles to watch DVDs during procedures, and many options for sedation

Our Motto: “We Treat No Gum Until It’s Numb™”

Deliberate Therapy: All treatment must be supported by a clear, explainable rationale that you can understand

For best results: Follow all instructions

Up until the 1990’s little was known how to treat gum recession and many efforts to cover exposed roots failed. Since that time, the treatment and repair of periodontal recession has been a major focus of research in periodontics. As a result, there are numerous surgical techniques now used to both treat and prevent periodontal recession. The term periodontal plastic surgery includes gum grafting techniques to help prevent periodontal recession and regenerate tissue to repair periodontal recession.

Nearly all periodontists treat periodontal recession. There are a variety of gum grafting techniques. Through the treatment of many patients over the years, we’ve developed some innovative techniques that avoid complications and pain associated with standard techniques. Some of the procedures we’ve helped to develop also increase the predictability of gum grafting and regeneration. While most standard techniques can be easily found on the internet, some of our techniques are currently unique to our practice though we have initiated research at our office and have instructed other periodontists and post-doctoral residents in dental schools around the United States. In particular, we seek to improve the standards of comfort, predictability, and esthetics of periodontal plastic surgery.

General Stuff: These surgical procedures are minimally invasive where little or no extra tissue is taken from the roof of the mouth (usually none is needed) and there are no large incisions made splitting tissues (results in little or no scarring). Most procedures are done under magnification or a surgical microscope using tiny stitches. They are done under local anesthesia alone, although sedation is available. Sedation options include taking a small pill just before treatment, use of nitrous oxide/oxygen (laughing gas), or intravenous sedation. Sometimes we’ll give beta-blockers (common medication to lower blood pressure) to prevent the heart from reacting to adrenaline, the chemical your body pumps out that makes your heart race. These beta-blockers are sometimes used by performers for Step fright. A good feature of nitrous/oxygen and beta blockers is that it’s fine to drive home after taking them since they are non-sedating. We also have those cool movie goggles so patients can watch one of our 200+ DVDs (makes time melt away).

We make a big deal about comfort. We’ve calculate very comfortable ways of giving local anesthesia that is used for these procedures. Of course we start with application of a topical anesthetic before any injection and we use a “starting anesthetic” that has a neutral pH (low acid) that is known for its comfort. We then “back up” this anesthetic with a longer lasting one so you are comfortable throughout the procedure. If you have any special requests or react in a special way to local anesthetics, please let us know. No one knows better than you how you react to medications. To let you know how important good anesthesia is for our patients, I’m sure you’ll remember our motto: “We treat no gum before it’s numb™”. And we live by that motto!

Another principle we hold to is one that assures our patients that the site being treated is being treated correctly and with a clear rationale. We call this “deliberate therapy”. This concept dictates that each site we treat indeed needs the prescribed treatment and as such, we should be able to clearly explain to our patients the diagnosis that justifies treatment and we should be able to explain the reason(s) why we chose a specific type of procedure to address the problem. Additionally, “deliberate therapy” means that we treat only the sites requiring therapy and make all reasonable efforts to avoid treatment of tissues that do not require treatment. We developed this ethical standard based on common treatment techniques that often include unnecessary invasion of healthy tissues. The development of these techniques were well-intentioned, but do require continuing questioning and ongoing evaluation for assuring validity. We require of ourselves that we do not blindly follow routines, but continually be aware of being “deliberate” in our treatment.

We do recommend no talking for a couple days afterwards to keep tissues stable and make spouses/family/friends happy. Be sure to read the post-operative instructions very carefully and follow them very closely. While post-surgical complications are very rare, most of the time when they do occur, it’s related to patients “bending” the post treatment rules including excessive talking, too much physical activity, and eating the wrong foods too early.
Preventing Recession **Now and After** Treatment
For Long Term Success

**Treating the Cause(s) of Recession**

Success requires addressing the cause(s) of the recession

Toothbrush abrasion is a leading culprit
Stop scrubbing!

Toothpaste can be very abrasive

Sometimes teeth are too big for the jaw making gums and bone thin

Power brushes can cause recession too

No treatment to repair gum tissue and reverse recession will be successful if the cause of the recession is not addressed. Some contributing factors for recession don’t relate to behavior and some factors can be modified by behavior. If periodontal recession has an anatomic component such as having large teeth in a small jaw, repairs or treatment relies on the dentist or periodontist. However, many cases of periodontal recession have been contributed to by toothbrush abrasion, or simply brushing too hard. This can occur whether you use a manual or a power toothbrush. Well-meaning parents often taught children to “scrub” their teeth, but scrubbing teeth and gums often wears away the gum tissue and even cuts grooves into the roots of teeth. As these “scrubbing” kids grow up, a sense of well-being occurs with harsh brushing so that the irritation of brush makes teeth “feel clean”. This is a case of harm being caused by too much of a good thing. Add lots of toothpaste to the harsh brushing and the abrasion is made even worse. Most commercial toothpastes contain abrasives that can add to the abrasion, especially if used in large amounts.

Are you a hard brusher? One way of testing if you brush too hard is to look at your toothbrush. If brushing correctly, a normal tooth brush should last at least 3 months. It can be replaced when the bristle begin gettter soft or lose their resiliency. However, the toothbrush bristles should look just like the way you bought it. If you find the bristles are getting flattened or pointing in all directions of the compass, you’re brushing too hard.

Recession caused by hard brushing pushed gums away from bridge margins

Recession caused by hard brushing affected several teeth in a row

Recession caused by hard brushing were “repaired” by white fillings instead of moving gums back into natural position

Prevent & Protect: No Gum Graft Can Withstand the Stress of Over-Brushing

An objective test to determine if there is toothbrush abrasion is to look at toothbrush wear. *If used properly, your toothbrush bristles should look new after 3 months of use.* If bristles are matted down or splayed, you’re brushing too hard.

A good way to prevent abrasion is to hold the brush with fingertips only. At first it feels strange! But it works!
Develop a routine pattern of brushing all surfaces of your teeth without cleaning the same tooth twice

How can you break the “scrubbing” habit? Brush more lightly. OK, that sounds easy, but since you’re probably “addicted” to the “clean” feeling of toothbrush irritation, changing the habit will feel really weird. At first, you won’t believe you can really get your teeth clean by gentle brushing, but you can. Once you get used to being comfortable without the irritation, you’ll be “home-free”! Give yourself lots of time to practice gentle brushing, and don’t give up!

Start by holding your toothbrush with your fingertips. It doesn’t matter if you use a manual or power brush, you are no longer going to use the “full-fisted death-grip”. Why use your fingertips? It is very hard to put too much pressure on the toothbrush when using your fingertips alone. Also, use only a pearl-size dab of toothpaste rather than the large sweeping “nurdle” of toothpaste shown in toothpaste ads.

Flossing: While we often don’t see flossing related recession, dental floss, if used too harshly, can cut into gum tissue causing clefts or grooves in the gingiva (gums). Additionally, if large cleaning tools like toothpicks are forced too hard between the teeth, the compression can destroy the gums between teeth and, in extreme cases, can even “force” the teeth apart creating large spaces between teeth. That said, gentle but firm flossing is essential for good health of teeth and gums. The best floss is the one you will actually use. Remember, most teeth have 5 surfaces (inside, outside, the chewing surface, and the 2 sides facing the neighboring tooth). Brushing only cleans 3 of those 5 surfaces so only floss can thoroughly clean the remaining 2 surfaces. Why do most cavities and gum disease occur between teeth? These surfaces are the “flossing” surfaces that so many people don’t clean every day.

Stop smoking (you knew this was coming!): Smoking causes irritation to gum tissue that increases the risks for recession.

Stop chewing (tobacco): While the idea of smokeless tobacco seems to give comfort that derails the possibility of lung cancer, any tobacco products that are used or held in the mouth irritates the oral tissues to a level that can cause oral cancer. The irritation of tobacco being held in the mouth between the cheek and gums is especially harmful to the gum tissue and contributes directly to choking off gum tissue resulting in recession of periodontal tissues.

Yes, orthodontic straightening of the teeth will make you pretty, but often lost in the discussion is how straight teeth can help you keep your teeth. Many crooked teeth that lean toward the lips and cheek develop very thin gums or actual recession of the periodontal tissues because they are moving away from the jaw bone and the tissues that cover the teeth. Additionally, rotated and twisted teeth can choke the gum tissue between the teeth and make those tissues recede. Needless to say, crooked and crowded teeth are much harder to clean putting them at risk for decay and gum disease. Also, crooked teeth can’t rely on support of neighboring teeth to keep them in place so crowded teeth will get more crowded with passing years.Orthodontists are now skilled at correcting these problems for adults. With an aging population that will need good nutrition in later years, having teeth in the right position will help keep them in the mouth where they do the most good.
Gingival Grafting
The Art and Science of Reconstructing Periodontal Tissues

The Free Gingival Graft

Gum tissue (gingiva) is “freed” or separated from one part of the mouth and placed at a site that doesn't have enough gingiva

For some people, there is not enough protective gum tissue (gingiva) around the teeth, making the teeth prone to periodontal (gum) recession. This gingiva can sometimes be so thin it appears to be like wet tissue paper over teeth. In cases such as this where existing gum tissue is threatened, a soft tissue (gum or gingival) graft is recommended to thicken or fortify the gingiva. This increase in thickness makes the tissue stronger and more resistant to irritation. The term “free” indicates that gingiva from another site within the person’s mouth (donor site) is “freed” or lifted off its base and then moved and secured with stitches to the site where new tissue is needed (recipient site). The procedure involves only superficial tissues (a few millimeters) requiring only local anesthesia. Did you really think “free” meant we do them for no cost?!

Unpalatable – The Non-palatal Autogenous (from the same person) Free Gingival Graft

Nearly all periodontists use the roof of the mouth for graft donor tissue

We use donor gum tissue from “outside” gums (gums that face lips and cheeks) that eliminates touching the roof of the mouth

- Not using the roof of the mouth adds comfort
- No palatal injection
- No wound on the roof of the mouth
- No dressing or plastic healing appliance needed for the roof of the mouth

Palatal grafts can have a “patch-like” appearance

Each tooth is treated individually requiring less donor tissue

Each graft will have 3 or more tiny stiches about the thickness of a hair

Success rate for free gingival grafts are usually over 90%

Search the internet, speak with other periodontists, consult with dental school professors and they will state that the donor tissue for free gingival grafts comes from the roof of the mouth (palate). This has been the standard approach since the procedure was developed in the 1960’s and tissue from the palate does work well. Despite its predictability, the surgical wound from the roof of the mouth is often quite painful, both by injection of the palate with anesthetic and the discomfort during the first week of healing. To assuage the discomfort, dressings are applied to the roof of the mouth with or without a plastic appliance or “stent” that protects the palate. The discomfort can require pain medication and sometimes bleeding is a problem. However, there is a different way of doing the free gingival graft that we have developed and tested in our office that we believe is more comfortable and has a better appearance after healing. For more than 10 years we find that (with a few exceptions) the majority of patients have plenty of sound donor gum tissue on outside gum tissue (gums that face the lips and cheeks) that can be used with no damage to the donor site. In fact, these sites can be repeatedly “harvested” if necessary. Using this alternative location offers much improved comfort with no need for injections or wounds on the roof of the mouth. Additionally, since the outside gum tissue has the same character of the tissue that is desired in the graft, the non-palatal graft often “blends” better visually with surrounding tissues compared to grafts using the palatal tissue which often have a lighter color than adjacent tissues.

Dr. Simonds recently completed a clinical research project involving 20 consecutive patients with nearly 50 non-palatal grafts showing high predictability in this approach.

Following our commitment to “deliberate therapy”, our free gingival grafts are placed only where they are needed (usually over tooth roots – not between teeth). When several teeth in a row need more gum tissue, the conventional approach is to use a “strip” of tissue from the roof of the mouth to treat 2 or more teeth. However, the gums between teeth usually do not need the extra tissue unless there is a specific need for more tissue. By treating each tooth individually, less donor tissue is needed and donor wound sites are smaller. This approach does take longer to do and is more delicate, but the benefits of minimizing the surgery site make it worthwhile.

All grafts in our practice are done under magnification and often with the use of a surgical microscope. The grafts are held in place with tiny stiches (often dissolvable) about the thickness of a hair and by a very thin blood clot.

The primary function of the free gingival graft is to supplement protective tissue and prevent future recession, not to cover root surfaces exposed by pre-existing recession.
Case #1: Non-Palatal Free Gingival Graft to prevent recession:

This case shows lower front teeth with no significant gum recession, but the gums are very thin and there is interference of a frenum (a bundle of tissue fibers that can sometimes come too close to the gum line and contribute to recession. The gingiva or gums are quite thin on the 2 front teeth and the frenum attaches very closely to the gum line. 3 small free grafts were placed to increase the amount of gum tissue to prevent recession on these teeth and the grafts also helped move the frenum away from the gum line.

Instead of the routine use of the roof of the mouth for getting graft donor tissue, two adjacent sites were used as well as a site around an upper front gum area.

Other sources of donor tissue for gum grafts: To date, there are no tissues or products that show the predictability of increasing gingiva as does tissue moved from one site to another in the same person. These are called autogenous grafts. There are other materials including tissues taken from other individuals (donated skin or other tissues) that have been used to grow more gingiva, but they compare poorly to one’s own tissue. However, we anticipate that sometime gingiva will be able to be grown in laboratory cultures using the patient’s own cells that will require taking a very small amount of tissue in order to grow tissue of nearly any size or dimension.

Case #2: Another Non-Palatal Free Gingival Graft to prevent recession:

When receding gums are diagnosed at the very early Step of tissue movement, they can sometimes be immediately reversed with a free gingival graft. This is especially true in younger patients.

This patient’s dentist quickly recognized the thin gum tissue and the very start of recession of the tooth in the center. The tooth on the left has no recession, but the gum tissue over the root and bone was so thin, more gum tissue was added at the same time we treated the tooth “next door”.

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"Tire Patch" grafts (done by no one we know)

They are good examples of ugly grafts. They work to help prevent recession, but they are too large (most people do well with a moderate amount of protective gum tissue [gingival]), they graft areas that don’t need grafting, and one can unpleasantly imagine how much tissue must have been taken from the roof of the mouth and the likely discomfort that accompanied the wound on the palate.

How big must a graft be? This untreated tooth has gingiva of normal width and thickness

Most periodontists do much better than these, but they show the typical color difference between tissue from the roof of the mouth and the color of natural gum tissue (gingiva)

Repairing Recession – Rebuilding lost gum tissue to protect bone and teeth

In the rapidly changing field of periodontal regeneration, many dentists are just learning about the potential to grow back gum tissue

How can we repair gums that have already receded? For many years, reversing recession and restoring gums to their natural position was an unpredictable affair. Failure to cover roots led many periodontists to abandon any attempt to do so. In fact, many general dentists are just learning about the increased predictability of covering exposed tooth roots. Rather than put fillings in decayed, worn, or discolored exposed roots or covering the roots with long porcelain crowns, dentists are now providing patients with the opportunity to “turn the clock backwards” and restore the gums back to their original position through gum grafting

The Coronally Advanced Gingival Graft to Cover Roots

Gum (gingival) tissue is loosened and moved to cover recession

Complicating factors include crowded or rotated teeth, poor gum contours can compress the vital tissue between the teeth

For patients with lots of good gum tissue that are receded, we often use the coronally advanced graft: This surgical procedure simply loosens the existing gum tissue by teasing it off the underlying hard tissue (bone) making it “movable”. By loosening it just enough, the gum tissue can be placed over the receded root like a window shade. Once in its desired position, a tiny suture (stitch) similar to a thickness of hair secures the tissue in position by weaving it between the teeth. One advanced technique we often use keeps all the gums intact while we loosen it. This means that there is minimal incision of the gums. Most of the loosening is done through the gum line and most tissue between the teeth remains intact. This preservation of the papilla, or the gum tissue between the teeth helps healing and prevents deforming this important tissue. If teeth are too close together, the papilla might be too fragile to keep it together or the surgeon may use a different technique is appropriate, but special care is taken to minimize hurting this “pointy” tissue between the teeth.

Complicating factors can be poor contours of gum tissue, crooked or rotated teeth, and tooth crowding that compress the tissue these papillae that carry nutrients to the gum tissue
There is plenty of sound gum tissue (gingiva) but the crooked and rotated teeth and likely history of inflammatory disease (gingivitis or periodontitis) have left the tissue in between the teeth (papillae) in poor condition. Such circumstances make regeneration difficult but could be improved if teeth are straightened.

**Case #3: Coronally advanced graft:** Existing tissue is drawn over the roots while keeping tissue in between the teeth intact. This case was done for Dr. Simonds’s cousin who flew in from Maine. The post-operative photo on the right were taken when he subsequently went back East, so the color tone of tissues is different than the West Coast lighting on the left. She had plenty of good gum tissue (gingiva) so all that was needed was to move the receded gingiva back into position. Notice the deep grooves that were carved into the roots by toothbrush abrasion. Before moving the tissue over the roots, the grooves were removed by reshaping or “sculpting” the roots into a normal shape to receive the graft. This allows the finished teeth to appear normal in size and shape.

**Case #4: Coronally advanced graft:** Same procedure for a different patient

Some dentists would put fillings on the discolored roots and cover the teeth and roots with crowns

More dentists are now aware that rather than patch the teeth, restoring the natural condition of the gums and teeth is a practical option.
The Coronally Advanced Gingival Graft with Connective Tissue to Cover Roots

The standard approach for treating recession **is the sub-epithelial connective tissue graft**

*Good success rate*

**Connective tissue (tissue under the skin on roof of the mouth) is removed and placed under a coronally advanced graft**

The conventional and standard method of correcting recession **when the existing gum tissue is thin or absent** is to perform a 1-Step procedure called a *sub-epithelial connective tissue graft*. Phew! What a term! As with the free gingival graft, nearly all periodontal residencies and dental schools use this as the standard technique for correcting periodontal recession. This highly successful procedure has the operator take tissue from under the skin of the roof-of-the-mouth (called connective tissue). This tissue is then lifted away and the connective tissue is placed under a flap of tissue that is loosened and moved over the connective tissue and receded root. The root is prepared by cleaning and sometimes treated with medications intended to help the soft tissue adhere to the roots. Stitches (sutures) are used to secure the flap and connective tissue in place. An alternative tissue that can be used is freeze-dried human skin that is used in place of the connective tissue which avoids the palatal donor site.

**Case #5: Connective tissue graft:**

This is typical case where the connective tissue from the roof of the mouth is removed and placed under a flap (tissue loosened from its base and folded back to allow for placement of the connective tissue). The have good predictability and are performed in a single visit.
The Non-palatal (roof-of-the-mouth) Approach to Cover Exposed Roots:
Free Gingival Graft plus Coronally Advanced Graft vs. 
standard Palatal Connective Tissue Graft

For patients with little or no gum tissue (gingiva) plus recession exposing tooth roots, we often use one of 2 types of procedures we have developed here. We add gingiva with a non-palatal free gingival graft with a coronally advanced graft that covers the exposed root: In most of these cases, the roof of the mouth is never used as a donor site.

Some issues with the Connective tissue graft has led to development of an alternative technique

This new approach avoids connective tissue graft problems:
- Unpredictable amount of donor connective tissue on roof of the mouth
- Possible inability to harvest adequate donor tissue
- Common bleeding and pain on roof of mouth
- Roof of mouth requires dressing or healing appliance
- Grafted connective tissue may become too thick or too thin
- Resulting tissue often is not pink gum tissue (gingiva)

The resulting tissue of the new techniques is true pink gum tissue (gingiva)

The new procedures can have a higher cost than the connective graft

A benefit of the *sub-epithelial connective tissue graft* (tissue just under the surface skin) is that it often works quite nicely, and is an option we offer patients in addition to the new techniques. Some weaknesses of this technique to correct periodontal recession include: 1. A lack of a predictable amount of connective tissue on the roof-of-the-mouth which may not be adequate for the patient’s needs. 2. The challenge of harvesting the correct amount, thickness and shape of connective tissue from the roof-of-the-mouth (visibility can be difficult). 3. Bleeding problems on the roof-of-the-mouth are not uncommon. 4. Positioning the graft in the proper place must be precise. 5. The roof-of-the-mouth requires dressing or plastic appliance. 6. Post-operative pain (sometimes intense) from the roof-of-the-mouth is common. Since some of the grafted connective tissue may not grow, the thickness of resulting tissue can be unpredictable. 8. The resulting tissue covering the root may not appear as pink gum or gingiva. While some tissue reshaping can reveal new pink gingiva, if the healed tissue is not thick enough, reshaping the tissue may not be possible.

The advantage of these new techniques is that it usually does not require any procedure on the roof-of-the-mouth which precludes all complications associated with taking connective tissue from the roof-of-the-mouth. These techniques eliminate any lack of predictability related to connective tissue taken from the roof-of-the-mouth. Since a free gingival graft is done in addition to tissue positioned over the root both root coverage and growing new pink gingiva can be achieved.

The use of free grafts added to root coverage was originally described in the 1970s though it included free gingival grafts from the palate. The roof-of-the-mouth was not spared. The technique described here was developed in our practice. While generating predictable and desirable results there may be an increased cost of the procedure. This delicate procedure usually performed with the use of a surgical microscope.

Let’s Talk Comfort and Recovery

We take these two areas very seriously. Since each person responds differently from another, we want to approach everyone in a special, gentle, and compassionate manner. In fact, we trust you to tell us how comfortable you were.

Do gum graft procedures hurt? Special care is given to make the surgical experience much better than expected. All procedures use local anesthetics. These work nicely since most procedures are very superficial; rarely are deeper tissues treated. Even so, we use topical anesthetics to make anesthesia application easier. Dr. Simonds uses the motto: *We treat no gum before it’s numb!* It may sound silly, but it gets the message across! You’ll also be pampered with buckwheat pillows, comfy blankets, and patients love our movie goggles where you can watch streaming videos of your choice while you’re being treated. There are also sedation options for you including nitrous oxide, oral and IV sedation techniques.

Is there a lot of pain after grafting? While everyone responds differently, most people may have soreness for 2-3 days or fewer. However, in rare cases, the site can be sore up to a week. Since many treatment options avoid treating the roof of the mouth, recovery can be quite comfortable. The patients with the most comfort are those who follow the instructions very closely.
The SimulGraft™
Single Step Non-palatal Approach
to Expand Pink Gingiva and Cover Exposed Roots:
Free Gingival Graft completed simultaneously
with a Coronally Advanced Graft

In this procedure developed in our practice, a single treatment can now be done to achieve two goals.

Conventional soft tissue graft therapy offers 1) predictable increase in protective pink gingiva with a free gingival graft and 2) predictable coverage of tooth roots exposed by periodontal recession with a range of grafts including use of palatal connective tissue or other material such as freeze dried human skin (allograft).

However, neither of these procedures can routinely cover roots and add true gingiva in a single procedure with predictability.

The SimulGraft™ was developed and is being refined by Dr. Simonds in 2014 and was presented to the American Academy of Periodontology in 2015.

The SimulGraft™ simultaneously expands the band of true pink gum tissue (gingiva) on a tooth or teeth and covers the tooth root exposed by periodontal recession. This is all done while using no tissue from the roof of the mouth (palatal donor tissue) and consequently avoiding any risk of palatal pain, bleeding, or need for healing treatment on the roof of the mouth. The SimulGraft™ combines the predictability and minimal invasiveness of the non-palatal free gingival graft with coronally advanced (tissue moved over the root) graft.

While continuing to be studied and evaluated, the confidence level achieved with this procedure is at such a level that the SimulGraft™ is now our primary recommendation for patients with both mild to moderate periodontal recession and lack of protective pink gum tissue (gingiva).

The Key Components of the SimulGraft™

**Non-Palatal**

Unlike conventional sub-epithelial connective tissue grafts that are usually taken from the roof of the mouth, the SimulGraft™ uses a thin piece of gum tissue from common sites on outside gum tissue such as the triangular tissue between the teeth. This tissue heals back without damaging the site. In rare instances where there is insufficient non-palatal tissue available, the palate remains a donor tissue option.

**Uses the Patient’s Own Tissue Only**

The SimulGraft™ uses the patient’s own tissue and does not require an alternative of taking cadaver skin from a tissue bank.

While standard procedures have good predictability, it can often happen that no new pink gingiva is created by the graft. The SimulGraft™ predictably adds this pink tissue to the treatment site. We feel the pink gingiva restores the natural protective structure of the gum tissue and also provides natural appearing tissue.

**Expands pink gum tissue (gingiva)**

Like the standard palatal connective tissue graft of the grafts using cadaver skin, SimulGraft™ covers many types of periodontal recession predictably.

**Covers areas of periodontal recession**

The SimulGraft™ was developed to treat one or multiple teeth in a single visit similarly to connective tissue grafts, but without any disturbance to the roof of the mouth.

**All-in-one**

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The SimulGraft™ Simultaneous Root Coverage plus Supplementing Protective Gum Tissue (Gingiva)

*without the need for roof-of-the mouth tissue (palatal) tissue or other donor tissue*

1. **Periodontal recession**
2. **Recession eliminated and new gum tissue in place**
3. **Tissue around recession prepared**
4. **Freed gum tissue placed over prepared tissue**
5. **Prepared tissue moved to cover exposed root**
6. **Tissue "freed" from outside gum (new tissue fills back in during healing)**
7. **Tissue over root with stitch placed**
Case #7: One step SimulGraft™ covering the exposed roots and adding protective gum tissue (gingiva):

- Periodontal recession and inflammation caused by bacterial plaque building on the exposed root
- Tissue thickened by free graft alone
- Root covered and pink tissue added by SimulGraft

Case #8: One step SimulGraft™ covering the exposed roots and adding protective gum tissue (gingiva):

- Periodontal recession, loss of pink tissue (gingiva) and abrasion of root
- Root covered and pink tissue added by SimulGraft
The 2-Step Non-palatal Approach to Expand Pink Gingiva and Cover Exposed Roots: Free Gingival Graft completed followed by a Coronally Advanced (Root Covering) Graft

In situations of severe periodontal recession where predictable root coverage with regeneration of pink gums (gingiva) without using the roof of the mouth cannot be reasonably achieved with the 1-Step SimulGraft, a 2-Step Non-Palatal approach is often a good option.

Conventional soft tissue graft therapy offers 1) predictable increase in protective pink gingiva with a free gingival graft and 2) predictable coverage of tooth roots exposed by periodontal recession with a range of grafts including use of palatal connective tissue or other material such as freeze dried human skin (allograft).

However, neither of these procedures can routinely cover roots and add true gingiva in a single procedure with predictability.

The 2-Step approach increases predictability by performing 2 more predictable procedures sequentially. There is usually a recommended 1-2 month waiting period between treatment stages. The waiting time may be longer between stages since there is more protective tissue after Step-1 that should protect the site from further recession.

In Step-1, a site with periodontal recession and inadequate protective gingiva is treated with a free gingival graft to increase the amount of sound gingiva. In the procedure, donor gingiva is “freed” up from a separate site in the mouth (we usually avoid using the palate) and grafted into the site that needs the extra tissue. The free graft is one of the most predictable procedures in periodontics. Occasionally, some of the periodontal recession can be reduced with the free graft depending on certain conditions.

In Step-2, the newly grown gingiva is loosening from its base and drawn over the tooth root exposed by periodontal recession. If there is sound gum tissue between the teeth and if other conditions are favorable, much of the exposed root can be covered. With proper care this treatment can be long lasting.

The Key Components of the 2-Step Approach

Non-Palatal

Unlike conventional sub-epithelial connective tissue grafts that are usually taken from the roof of the mouth, the Step-1 procedure uses a thin piece of gum tissue from common sites on outside gum tissue such as the triangular tissue between the teeth. This tissue heals back without damaging the site. In rare instances where there is insufficient non-palatal tissue available, the palate remains a donor tissue option.

Uses the Patient’s Own Tissue Only

Like the SimulGraft™, the 2-Step Approach uses the patient’s own tissue and does not require an alternative of taking cadaverskin from a tissue bank.

Expands pink gum tissue (gingiva)

While standard procedures have good predictability, it can often happen that no new pink gingiva is created by the graft. The 2-Step Approach predictably adds this pink tissue to the treatment site to a degree even greater than the SimulGraft™. We feel the pink gingiva restores the natural protective structure of the gum tissue and also provides natural appearing tissue.

Covers areas of periodontal recession

Like the standard palatal connective tissue graft or the grafts using cadaver skin, both the SimulGraft™ and 2-Step Approach covers many types of periodontal recession predictably. Like the increased predictability of the 2-Step Approach in rebuilding gingiva, it also has enhanced predictability to cover exposed roots.

Requires 2 surgical treatments

The SimulGraft™ was developed to treat one or multiple teeth in a single visit similarly to connective tissue grafts, but without any disturbance to the roof of the mouth. As suggested in the name, the 2-Step Approach does require two surgical treatments. The benefit of the 2-Step Approach is the increased predictability of both creating new gingiva and achieving maximum coverage of exposed by periodontal recession compared to other techniques including the SimulGraft™.
How the 2-Step Non-Palatal Approach Works:

Step 1: Add protective gum tissue (Gingiva) with Non-Palatal Free Gingival Graft

Just like the Non-Palatal Free Gingival Graft used to prevent recession described before, a site with periodontal recession and little or no gingiva first is treated to add more gingiva. This 1st Step graft:

1. Adds protective tissue that will protect and stabilize the gum line.
2. Provides a known amount of gum tissue that will used to cover the recession in the 2nd Step procedure. This reduces guesswork.

Step 2: Move “new” protective gum tissue (Gingiva) to cover recession

Once the “new” protective gum tissue (gingiva) is added by the 1st Step graft, the receded tissue is now thicker, stronger and more resistant to future irritation.

The Step 2 procedure will now move this new healthy tissue into position to cover the root.

After numbing, the exposed root is cleaned and shaped

The gums are loosened so they can be drawn over the exposed root(s)

Conventional “flap” is not used

The pointy tissues between the teeth (papilla) remain intact

After numbing, the exposed tooth root is cleaned, reshaped, or otherwise repaired (such as removing decay or old fillings) so it is prepared to accept the new gum tissue that will cover it.

The gums to be moved are loosened by gently “teasing” them off the underlying tissues. This makes the tissues moveable like a loose fitting shirt. Without making significant incisions or cutting papilla (the pointy gums between the teeth), most of this loosening is done through insertion of instruments under the gum line and through a small incision in the loose tissue next to the gums. Unlike conventional procedures where the gum tissue is lifted off by a “flap” with a gum line incision, this conservative technique
Stitches (sutures) hold tissue in place

Within the next 2 weeks, skin cells will form a seal between the tooth root and gum tissue

keeps nearly all the outside gum tissue, including the gums between the teeth, intact retaining much of the nutrient supply to the gum tissue.

The tissues are held in their new position using small stitches (sutures) that are “woven” between the teeth. After a week or two, skin cells work their way between the gum tissue and the root and form a seal between them. If well cared for, this seal can function and be a successful long-term treatment.

Case #6: 2-Step root coverage with a free gingival graft done in advance of covering the exposed roots:

We often do a 2 Step procedure when tissue starts out very thin. Most periodontists use a single Step procedure of taking palatal connective tissue (the tissue just under the skin) from the roof of the mouth and place it under a flap of tissue that’s moved over the teeth. This works, but it usually does not create true “gum” tissue, but rather leaves a redder gum tissue that can look a slightly rounded or bulky. The 2-Step procedure creates real pink gum tissue (gingiva) and root coverage that looks more natural. Our treatment goal is to make it look like there was never a problem in the first place.

Severely receded tissue with no pink gums (gingiva)

Step 1 Complete: New pink gingiva added above recession to thicken the gums

Step 2 Complete: New pink gingiva is moved to cover recession

Case #7: 2-Step root coverage with a free gingival graft done in advance of covering the exposed roots: Same procedures, different patient:

Thin fragile receded tissue with no pink gums (gingiva)

Completed 2-Step root coverage with new pink gingiva
The Lateral Sliding Graft

When there is sufficient protective gum tissue next to a site with inadequate gum tissue (gingiva) and recession, the area “next door” can serve as the donor site for the graft. A preparation is made in the numbed recipient site (where the graft will be placed) while the tissue is lifted from the donor site, leaving the graft attached at its base. The donor tissue is “swung” over to cover the recession bringing with it the sound gingiva needed at the site of recession.

The Lateral Sliding Graft “swings” over tissue to cover recession

Uses a single site and a single procedure

Comfortable

Excellent match of donor and grafted sites

The advantages of this type of graft includes not needing extra tissue from another site and it will usually provide a better color match to the grafted site compared to a graft that comes from the roof of the mouth. Also, since the lateral graft is not totally freed from its base, it retains part of its nutrient supply. This improves the chances for a successful graft and provides improved possibilities for covering the root surface exposed by recession. Because there is just one surgical site, these grafts are often quite comfortable during healing.

How Do Root Coverage Procedures Compare?

In the confusing marketplace of dental treatment, how can patients make informed choices?

Each practitioner has his or her technique that works the best for them. Depending on the focus of the practice, some periodontists commit more or less time treating recession lesions and develop different expertise in certain procedures. Below is a chart of some of the technique available today and compares some of the features. Each patient who wants to make an informed decision which procedure to choose can highlight features that are most important and use these as discussion points before treatment is performed.
We hope this give a little view into how we treat recession. Of course, not every case is the same, and we’ve had instances where we need to “touch-up” a spot or two to reach the goal, but, in general, the procedures have become quite predictable. Even so, we continue to seek improvements in techniques. For example, we have been adding some biologic enhancement materials such as enamel matrix derivatives to assist healing and use of natural and synthetic materials to help rebuild the pointed papillas between the teeth. As long as there is room for improvement in treatment and patient care, we will continue to search for answers.