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Periodontics

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handout

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DOCTOR :
Ahmad Abd Al-Salam

DONE BY :
Renad Khanfar, Hana Kadri,
Amal Al-Dahneem

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هاتف :

0797121818
06/5336475

Contact Us:

 **Ljnehan**
 Dental.c2013@gmail.com

 **Dental Correctionn**
 D.correction2013@gmail.com

The selection of an appropriate surgical technique that can best satisfy the treatment goals and objectives is directly influenced by anatomical relations between bone, soft tissues and teeth. It is also imperative that the surgeon be familiar with the location of important anatomical structures especially the nerves and blood vessels. Trauma to vital structures may compromise patient safety and comfort and adversely affect proper wound healing.

Lets think of a scenario that will not lead to the death of the patient and will not lead to the hospitalization of the patient, but you have a complication; you started the surgery and by error you touch a small vessel, lets say a small artery, one of the most common is a branch of the (i couldnt get the word ;/) in the sinus lifting procedure or in connective tissue graft procedures. if you were are not sure where it is located , is it distal to the first molar or mesial to second molar or you are not sure where the branch is located on the boney wall because you didnt take a radiograph you will end up severing this artery that will start to bleed and arterial bleeding has nothing to do with the venous bleeding that you see. arterial bleeding is like a fund . this scenario is not a life threatning situation if you can deal with it, and most of the time you will be able to deal with it but why reach this?! because if you have this incident, patient's comfort will be affected, his safety will be affected and at the same time you stress levels will be escalating which means that your capacity of thinking and control your surgery will be reduced. which means that the results of the surgery will not be guarenteed and you will increase the risk of failure of your surgery because of a very stupid error that you did because you didnt take 5 minutes of your time to take a radiograph or to open your anatomy book. thats why all surgeons open their anatomy books everynow and then.

You need to know all the spaces, all the structures in the mandible and the maxilla. But the doctor said that he will not ask about the structures in the exam

What about the blood supply ?! Some people say that the maintenance of adequate blood supply to the tissue is the SINGLE MOST IMPORTANT surgical principle to follow. Why? because when you maintain good blood supply you can be sure that your cells have enough nutrients and energy to do the required job.

Anesthesia and Pain control

Providing profound and lasting anesthesia for the surgical patient is a crucial part of periodontal surgery. without it, surgical objectives are impossible to obtain, WHY? Because the stress of patient and provider will be elevated, thus the provider will be unable to think correctly and will start to do things very fast to finish and error will accumelate one after another. it is very complicated to see someone dealing with complications, but the triggering factor is very stupid. it is because that practitioner didnt invest in two minutes of his/her time to provide profound anesthesia. Moreover, if you cant provide anesthesia the patient's confidence in you will be diminished.

A successful surgery is partly based on your capacity of chosing the right LA drug. If thinkers thought that one single substance was able to cover all of the indications and requirments for surgery, they will not have spent year and years and thousands of money trying to find new materials for anesthesia.

Eukaryotic cells is made of (claverli?) which is based on energy saving. (i couldnt get what the



doctor is saying please check it)

The choice of local anesthetic depends on potency, velocity of action and duration of action. and we need to know the anatomy and the nerve supply to the area where you are going to do your surgery

You can do complete surgery on the upper first right molar to the upper left first molar with one carpule. you can place 5 implants with less than one carpule, but you need to give it very slowly, one carpule in two minutes. Why? because of a principle based on concentration gradients; substances move from the place with higher concentration to the place with lower concentration, if you do this with your anesthetic solution you created in one instant you increased the concentration in a logarithmic way so most of your anesthetic agent would be dissipated that's why in few minutes or within 20 minutes your patient will start to feel pain again even though you provided him/her with 3 or 4 carpules. But if you give it very slowly and take these 5 minutes of providing the anesthetic solution to the whole area and to strategic places based on your knowledge of the anatomy you can do your endo treatment during the whole session with less than one third of the carpule.

Aseptic surgical technique

Proper, clean instruments
surgical caps
disposable & sterile gloves
disposable & sterile gowns
eyes protection
scrubbing (in certain situations)

You need to prepare your patient starting with:

- an informed consent specific for the surgical procedure
- ORAL HYGIENE
- Smoking cessation for a week before, 3-4 weeks after surgery ideally
- preoperative rinse with CHX mouthwash for 30-60 seconds (this will kill almost 99% of the pathologic bacteria)
- prophylactic antibiotics for healthy patients; sometimes that in certain procedure you need to provide your patient with prophylactic antibiotics at least one dose

Atraumatic surgical techniques

The surgeon must be delicate and accurate in the management of all tissues within the surgical field

it involves certain **flap management** :

1) Incisions

- Incision selection and execution is based on careful planning that takes surgical anatomy, the surgical objective, flap design & the principles of atraumatic tissue management into consideration
- Incision should be using sharp cutting instruments. Dull instruments will lead to trauma more than a sharp instrument and trauma will affect wound healing
- you need to use definitive and smooth movement



-surgical predictability begins with clean and smooth incisions that will result in fasted healing and less patient discomfort

Done by:Renad khanfar

Atraumatic surgical technique

The surgeon must be deft, delicate and accurate in the management of all tissues within the surgical field.

The atraumatic surgical technique involves all these steps in flap management:

1. Incisions
2. Flap preparation
3. Flap design
4. Flap reflection
5. Flap retraction
6. Open flap debridement (OFD)
7. Flap positioning

Incision **selection and execution** is based on careful planning that takes surgical **anatomy**, the surgical **objective, flap design** and the principles of **atraumatic tissue management** into consideration.

We must use a sharp cutting instrument. Dull instruments will cause more trauma to the tissues than sharp instruments, and trauma will affect wound healing.

We also need to have definitive and smooth movement.

Surgical predictability begins with clean, smooth incisions. This will result in faster healing and less patient discomfort.

We have different types of incisions:

1. External bevel incision (gingivectomy)
2. Internal bevel incision (reverse bevel/inverse bevel)
3. Sulcular incision (crevicular)
4. Releasing incision (vertical)
5. Thinning incision
6. Cutback incision
7. Periosteal releasing incision

External bevel incision

You place your blade so that the tip of the blade goes towards the tooth. You will get a bevel that faces outside (NOT inside towards the tooth – that is the internal bevel).

We use it for:

- Pocket elimination
- Access to roots
- Improve gingival contours



It should be contained to the gingiva – do not extend it to the oral mucosa.

The blade is kept in a coronal direction.

It can be used in gingivectomy procedures or with flap surgery.

We have different techniques;

1. In 1884 they used the **straight incision technique**
2. In 1918 they started to use a scallop (**Scalloped incision technique**)
3. Now they use a different technique (check the slides for pictures)

What are the contraindications for the external bevel technique?

1. The presence of intrabony defects (why: we will not be able to access it)
2. Narrow zone of keratinized gingiva (Why: this type of incision will reduce the amount of keratinized gingiva)
3. When the probing depth is apical to the mucogingival junction (why: because if you want to eliminate the pocket, then you should extend your incision to the mucosa)
4. If there is a shallow vault/vestibule or a pronounced external oblique ridge
5. Esthetic concerns (why: it can be associated with increased risk of root exposure)
6. High caries index
7. Preexisting root insensitivity

Internal bevel incision

It is the opposite of the external bevel incision. The bevel will be facing inside (towards the tooth).

It is useful in apically positioning the palatal flap margin.

We can use it on facial surfaces with adequate keratinized gingiva.

It is a scalloped incision.

You need to anticipate the amount of removal that you need to do.

Sulcular incision

Your blade passes through the sulcus to preserve tissues, because here we don't remove tissues (unlike the bevel incisions).

Vertical releasing incision

It should be released along the line angles of the teeth to

- increase access to alveolar bone
- decrease tension of flaps
- limit the inclusion of non-diseased sites.

It should not be placed on

- Pronounced concavities
- Prominent bony ledges or exostoses
- Root prominences
- The middle of the dental papilla

It is better to include the papilla for the preservation of the blood supply



Thinning incision

It is an incision that is used to reduce the thickness of the flap from the underside.

It helps to obtain

- Better flap adaptation
- And greater comfort for the patient and the dentist

Some variants of the thinning incision are

- The triangular wedge
- The linear wedge
- The trap door

The distal wedge (triangular) is used when you work on a distal tooth (last tooth in the arch). Mesial wedge is when you work on a mesial tooth.

You place two incisions in a triangle distal to the tooth and then remove the tissue. Apical repositioning occurs.

The same thing applies to the rectangular (linear) wedge.

The trap door is done when you have a limited amount of keratinized gingiva and you don't want to lose it. You open the tissue and reflect it like a trap and then remove the tissue underneath (preserving the keratinized gingiva above).

Cutback incision

It is an incision that allows greater movement for the flap. Imagine a flap with two vertical incisions that you want to slide. In order to slide the flap to another position, I need to release the flap with another incision (from the top of one of the vertical incisions horizontally) for freedom of movement.

Tension is reduced.

It is always used with pedicle flaps that we need to rotate.

Periosteal releasing incision

It is always used with coronal or lateral advancement.

It is an incision where you get into (beneath) the flap for better advancement. (Undermined incision)

Flap preparation

We can prepare our flaps in 2 ways:

- Full thickness flap (mucoperiosteal flap). Here you reach the bone.
- Partial thickness flap (split-thickness flap). Here you leave some periosteal tissue on top of the bone.

Memorize this table. (at least one question will come from this table)



Table 1-7 Comparison of Full-Thickness Flap and Partial-Thickness Flap

	Full Thickness	Partial Thickness
Healing	Primary healing	Secondary healing
Technical difficulty	Relatively easy	Difficult
Bone defect treatment	Possible	Difficult
Blood supply to flaps	Sufficient	Decrease
Elimination or reduction of periodontal pocket	Possible	Possible
Use with mucogingival surgery	impossible	Possible
Bleeding	Less	Much
Postoperative swelling	Less	Severe
Postoperative pain and discomfort	Less	Much
Fixation of flaps	–	Firm fixation with periosteal suture
Possibility of flap penetration	Less	Much
Thin flap preparation by primary incision	Difficult	Easy
Augmentation of the band of attached gingiva	Possible	Possible

The difference between them:

- Full thickness flap is easier to deal with and manipulate
- Healing is easier with the full thickness flap
- Blood supply is not decreased with the full thickness flap
- Less bleeding with the full thickness flap
- Easier management with the full thickness flap
- Technical difficulty: full thickness is relatively easy
- Higher possibility of flap penetration with the partial thickness because it is thinner

If you understand the flaps, you will understand the table and won't need to memorize it.

Do not confuse the thinning incision with the partial thickness flap. (The thinning incision is an INCISION, not a flap). You use the thinning incision to obtain the partial thickness flap (one leads to the other but they are not the same thing). You can also do a thinning incision to reduce the bulk of a full thickness flap.

Flap design

Flap design should be based on this important point: always maintain optimal blood supply.

This is decided by:

- The type of flap preparation
- Use of releasing incisions
- Flap length (height to base ratio)

Different flap designs are available according to the indication of the surgery and the objective of the treatment. We will take these next year.

Flap reflection

Flap reflection should be done after:

- Atraumatic elevation



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- Papilla should be reflected first and then the marginal gingiva
 - Use a gentle force
 - Follow bone morphological contours

Flap retraction

Flap reflection should always be passive. If you prepare and reflect your flap correctly, then you will get passive retraction.

Retractor edge should always be resting on bone.

Continuous flap retraction should be avoided.

Irrigate the surgical site every now and then (frequently). – Why? To maintain blood supply (avoid hypoxia) – if you don't do frequent irrigation, with time the tissues will shrink and when you want to close the flap, it won't return to their original position (thus: frequent irrigation is to maintain fluid content of the tissue).

Open flap debridement

It is the prototypical periodontal flap surgery.

Most often it is a sulcular incision. It is opened, reflected, retracted and then you start to debride the tissues – scaling, root planing and removal of granulation tissue.

This increases the effectiveness of scaling and root planing

This allows debridement of granulomatous inflammatory tissue

As some people say, “simply stated, roots are planed, defects are degranulated, and flaps are closed either at or apical to their original position.”

Flap positioning

Now we need to close our flap. How should we close it?

- Reposition the flap to where it was
- Apical repositioning
- Coronal repositioning
- Rotate the flap laterally

The final position should be planned before the beginning of the surgery. It should be determined by the goals of therapy and the surgical technique.

Most importantly: positioning should be PASSIVE. It is not your sutures that will close the wound; it is the passive positioning of the flap. Wound margins should close together without any tension and sutures are there to help keep the margins in place. When you close under tension, within 3-4 days the patient will return with an open wound.

Done by Hana Kadri

Good luck



Open flap debridement: it is the proto-typical periodontal flap surgery, it is a flap that is opened with a blade, reflect it, retract your flap, then you start to debride the tissues (debridement of the periodontal flap that is open with scaling , root planning and removal of inflammation tissue)

This will increase the effectiveness of scaling and root planning and debridement of inflammatory tissues and as some say simply roots are planned, defects are granulated and flaps are closed all of that in their original position.

After we finish the surgery we need to close, How to position the flap?

You can position it more coronally or more apically you can take it lateral, the final position should be planned before the beginning of the surgery, and determine the final goals of the therapy and the surgical technique and most importantly your positioning should be passive, it is not your sutures that will close the wound, it is passive positioning, wound margins should close together without any intervention, and sutures help them stay in their place. When you close under tension, within 3-4 days the patient will come back again with open wound.

Hemostasis, it could be intra-operative, there will be no blood because we respected anatomy and profound anesthesia and atraumatic surgical technique. Post-operative hemostasis, after wound closure there should be no bleeding no oozing.

Intra-operatively, to prevent excessive bleeding (bleeding will happen during surgery, but how to reduce it?) we need to know the medical history of the patient, the surgical anatomy, if you have good oral hygiene and good tissue at the initial therapy, we will not have any problems, when we operate on an inflamed site, and inflammation is associated with increased blood supply so more bleeding. In anesthesia we usually use vasoconstrictor.

What if intraoperative bleeding happens? You need to go this way, pressure, vessel ligation, suture, bone burnishing, bone wax, topical hemostatic agent, or again give another injection of local anesthesia.

Is it good to give anesthesia to stop bleeding? No, because it is ineffective, and temporary, once the anesthetic agent is absorbed bleeding will start again.

Post operatively you prevent it with the same principles of intra-operative bleeding , by direct pressure on the wound margins once you finish the surgery.

The management of bleeding, you need to locate the source of bleeding, mesially , distally, buccally, lingually...., you open the wound and apply the previous methods and then close the wound.

Suturing

It is as important as incision placement and flap management to the outcome of the surgical procedure, flap adaptation and sterilization at the end of the procedure are equally important, you should not rely on sutures to pull the flap beyond its passive positioning, because tension will be created on the flap.



We have different sutures materials, different types of needles it relies on the tissue type, thickness, location of surgery in the mouth, the ease of handling, the cost .

The surgical technique depends on the final flap positioning, the surgical procedure itself, and the ease of placement.

Wound management

Wound dressings, post-operative instructions, which includes;

1. pain medications
2. avoid chewing on the surgical site until told otherwise, this could be for 2 days and some cases it can be for a month
3. the patient should not bite on the site
4. avoid mechanical plaque control in the area until told otherwise
5. Use chlorhexidine mouthwash twice daily for 48 hours after surgery
6. Use a gel on the surgical site for 2 times daily because mechanical plaque control is prohibited
7. Soft diet should be used for 24-48 hours
8. Avoid hot food and drinks for 48 hours
9. Intermittent application of ice pack during the first 24 hours (**to reduce the blood supply so you can control the edema, bleeding you already controlled when you sutured it correctly , now after surgery you need to control the edema, because excessive edema can affect the integrity of the wound and can complicate the wound healing processes , as we said the blood clot I need it needs to be the smallest as possible, edema might increase the blood clot**) then on the second day we put a warm pack(if you use the ice pack it will decrease the healing process because you are reducing the blood supply, the second day it is the moment you need increased blood supply for healing process , need more influx of neutrophils and macrophages, oxygen and nutrients for the cells to start their work in the surgical site)
10. Stop smoking in the healing phase.(smoking cause vaso-constriction in initial contact, then it will reduce the blood supply, by reducing the number of blood vessels, and it will produce a more anaerobic environment that is hard for wound healing, and also for all the toxic substances that it has)
11. Avoid rinsing for 24-48 hours even with water
12. Avoid excessive physical activity for first few days, almost for 1 week, this will affect the integrity of the wound as well.

Wound healing

- Inflammatory phase, granulation phase, remodeling phase .
- Primary intention, secondary intention (granulation tissue formation in a non closed wound), tertiary intention (gap, infected primary → scar)

Why you remove the sutures 10-14 days after surgery?



- Because epithelial migration needs 14 days, you should not wait less than that, your wound will be very fragile and maturation should take about 42 days.
- collagen formation starts at 3-4 days and follow up to 3 weeks, and then maturation take up to 28 days
- revascularization begins at 3-4 days up to 14-15 days.
- Bone resorption ends at 21 days and formation start after 14 days and the maturation can take up to 2 years

All these govern the instructions that you give to your patient.

What influence the wound healing?

1. By the choice of instruments used
2. By the choice of incisions and their placement
3. By the decision and management of the flap
4. By the extent of alteration you produce to the tissues of the mucosa and wound
5. By the technique you used for stabilization
6. By post-operative care

The decision making should be based on evidence based therapy, with the current emphasis on the evidence base periodontic therapy , when available should be **the primary** driving force for therapeutic and surgical decisioning. Adding to that your clinical judgment , personal experience and patient differences; those should be integrated with solid science to improve the predictability , quality and efficiency of the perio therapy.

Done by Amal Al-Dahneem

Good Luck

