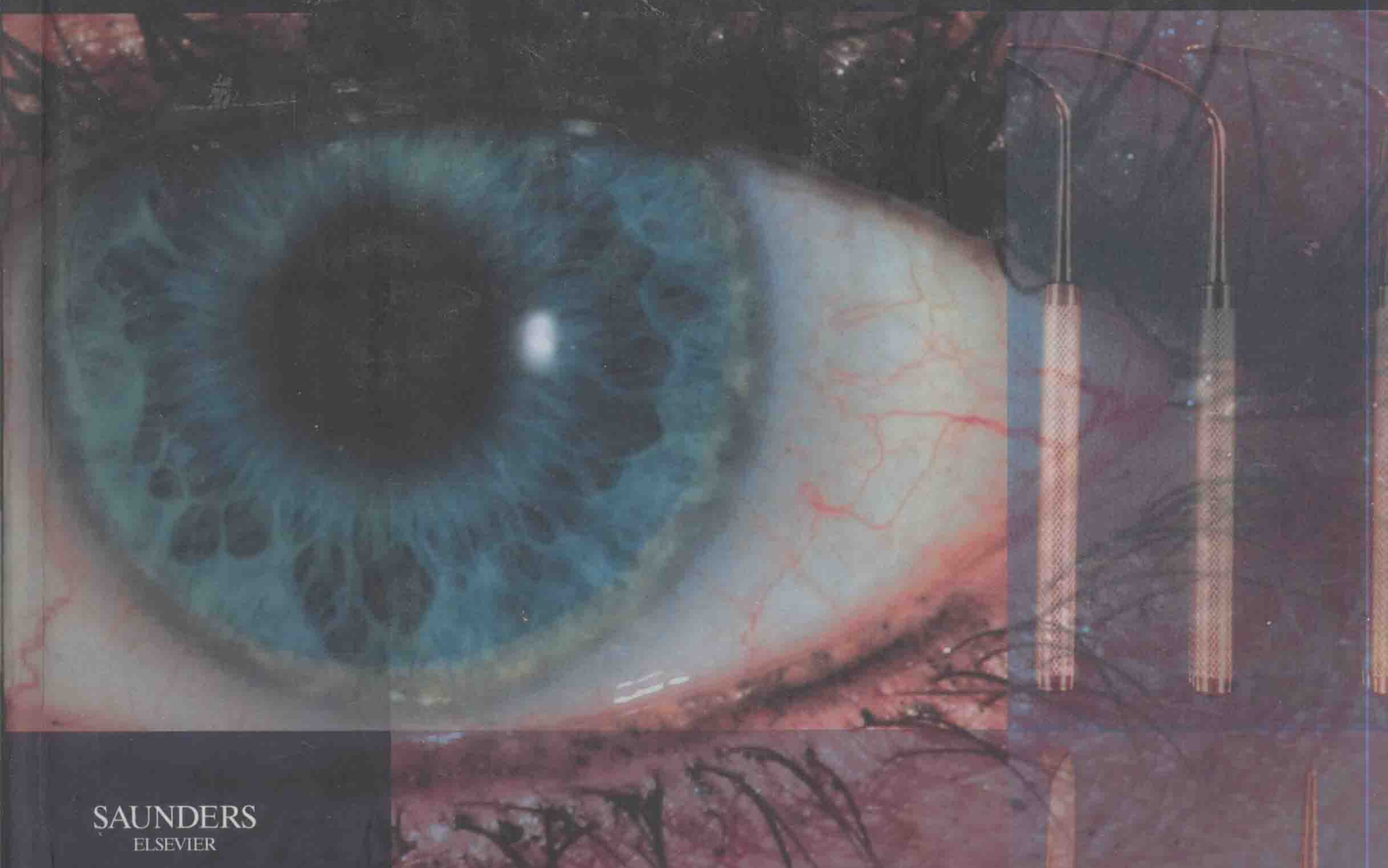
JEFFREY A. NERAD

Techniques in Ophthalmic Plastic Surgery

CONTAINS DVD-ROM

A PERSONAL TUTORIAL



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Techniques in Ophthalmic Plastic Surgery

A Personal Tutorial

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Techniques in Ophthalmic Plastic Surgery

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Video Contents

DVD running time approximately 2 hours and 10 minutes

Preface

Thank you for your interest in *Techniques in Oculoplastic Surgery – a Personal Tutorial.*

This text is for you if you want to learn the principles and techniques of oculoplastic surgery that you can put into use in your practice every day.

This text is based on the *Requisites in Oculoplastic Surgery* textbook that I wrote in 2001. The text was written as though I was at your side there to get you through each step of the evaluation and treatment. I have followed the format here with updates and new material where appropriate. Most common disorders and procedures are included – some less common also. I suggest that you start by flipping through the chapters to get familiar with the content and layout of the text.

The book starts with an introduction to surgical technique. Being well prepared before you enter the operating room is key to your results and efficiency. Be sure to read this chapter. The second chapter is surgical anatomy. I have tried to keep the anatomy very practical and have placed clinical examples throughout. These first two chapters are important – your success as a surgeon is based on your expert technical manipulation of normal and abnormal anatomy.

The remaining chapters are topic oriented ... ectropion, entropion, ptosis, and the like. All chapters begin with an outline of what is covered. A formal introduction to the chapter topic follows. A review of pertinent anatomy follows. The principles of evaluation and treatment are discussed next. Finally, surgical techniques with practical tips are outlined for you. The chapters are written in a hierarchal fashion that should make it easy for you to get the basics and then move more deeply into details on a second read. I have built in a large amount of intentional redundancy built into each chapter. Look at the summary boxes and use the checkpoints to make sure you are actually remembering what you just read. You will find over 500 diagrams and a similar number of photographs to help you understand put the principles into practice. You can check out the suggested reading list for another point of view. There are many good texts out now.

I have added a new chapter on Aesthetic Surgery. Many surgeons are including these procedures into the traditional oculoplastic practice. You will get a new appreciation of the aging process and learn the basics of skin care, resurfacing, peeling and many surgical techniques. I have included the important concepts of aesthetic forehead lifting, midface, full face and neck rhytidectomy. This is an area where an experienced mentor is helpful.

For me, learning works best in a "layered" fashion. Start with the big picture. Don't try to learn it all at once. Read and study the principles. Read again and again as many times as it might take to get the details. After you get confident in the principles and techniques, start with some easy procedures. Some of the procedures can get quite complicated. Ideally, you will have a mentor to help you put what you learn into practice. Don't forget to collaborate with colleagues outside your specialty. You will learn a good deal and make some great friendships along the way.

The techniques are described are not my own ideas, rather reflect over twenty years of practice learning from my teachers, colleagues and students. These are common approaches to the problems that you will see in your practice. The concepts and the style teaching are my own and the techniques work for me. Of course, these techniques are not the only ways to deal with a particular problem, definitely not the only way that works, but a way that does work for me. Try the techniques as written. As you get comfortable feel free to modify any part of the operation that seems to be an improvement for you.

Thanks again for reading this. If you have comments or questions, feel free to write or email me at the address below. You are on your way to a successful and rewarding surgical practice.

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Acknowledgements

I would like to thank the many people that helped make this book possible.

Thanks go first to my family. My parents, Frank and Blanche Nerad, made learning fun for my siblings and me. My daughters, Kristen and Elizabeth, and my wife, Jodi, offered support and encouragement throughout the whole process. Thank you very much.

My teachers, Rick Anderson, David Tse, John Wright, Richard Collins, and Dick Welham, were generous in showing me the "way" early in my career and continue to be valued friends and colleagues. Many others have taught me throughout my career. Special thanks to my colleagues, Robert Kersten, Jack Rootman, Jeff Carithers, and Keith Carter. Thanks to all the residents and fellows that have taught me so much over the last twenty plus years.

Many people helped with the production and technical aspects of the text. Thank you to my fellow, Jill Melicher, and videographer, Randy Verdick, for the work on the surgical videos. Thank you to Teresa Espy, my secretary, for managing my daily duties and correspondence. Thanks go to Susan Gilbert who made the illustrations for the original text and thanks to the art team at Elsevier for the colorizations and new illustrations. Thanks to the production team at Elsevier including Russell Gabbedy, Sharon Nash and Nayagi Athmanathan for all the direction and hard work throughout the process.

Thank you to all the readers that bought the first edition and offered suggestions and the encouragement that helped to make this book a reality. And lastly, thanks to those of you that are reading this new text. I hope that it plays some small role in your future successes.

Jeff Nerad

Contents

The Art of the Surgical Technique*

Chapter contents

Introduction

This chapter will serve as your introduction to some theoretical and technical aspects of actually performing surgery. Successful surgery starts with planning before you enter the operating room. To be effective, you must know exactly what you are going to do and pass this information on to the operating room team. Your well-thought-out plan will inspire confidence in the operating room staff. Once in the operating room, you are the team leader. You will coordinate the setup of the operating room and necessary equipment for your procedure.

To be effective, you will need to know the tools of the trade and how to use them. We will discuss the different types of instruments and their general and special uses. We will stress some fundamental techniques, including holding and cutting the skin. We will cover the important instruments used in retraction, hemostasis, suctioning, and suturing. In the last section, we will talk about the role of the assistant, an underestimated and revealing job.

Don't labor over the details of each section in this book. Rather, read the text several times as your abilities and interest increase, each time taking in more detail.

*In recognition of Dr. Milton Edgerton's excellent text on surgical technique, a book all surgeons should read.

Preparation for the operation

Firm plan with contingencies

When you enter the operating room, you should have a firm plan in mind for the operation. In your early experience, it is worth having a set of contingency plans if things don't go as expected. As your surgical expertise increases, your need to make formal contingency plans will disappear. Early in your career, or later when you are planning a new procedure, it is worthwhile having the steps of the operation and necessary equipment written down to bring into the operating room. The nursing staff will appreciate your preparation and be confident of your abilities.

You are the team leader in the operating room. Your behavior will set the stage for how the operation goes. You set the pace and the quality of the effort. If you are operating in a new setting, be sure to introduce yourself to the nursing staff. Discuss with the operating room team your plans for surgery. Your preparation and willingness to include them in your plans will improve the overall effort and will give the team confidence in your ability to get the job done. This approach applies to every surgeon, from new residents to experienced surgeons in practice for many years.

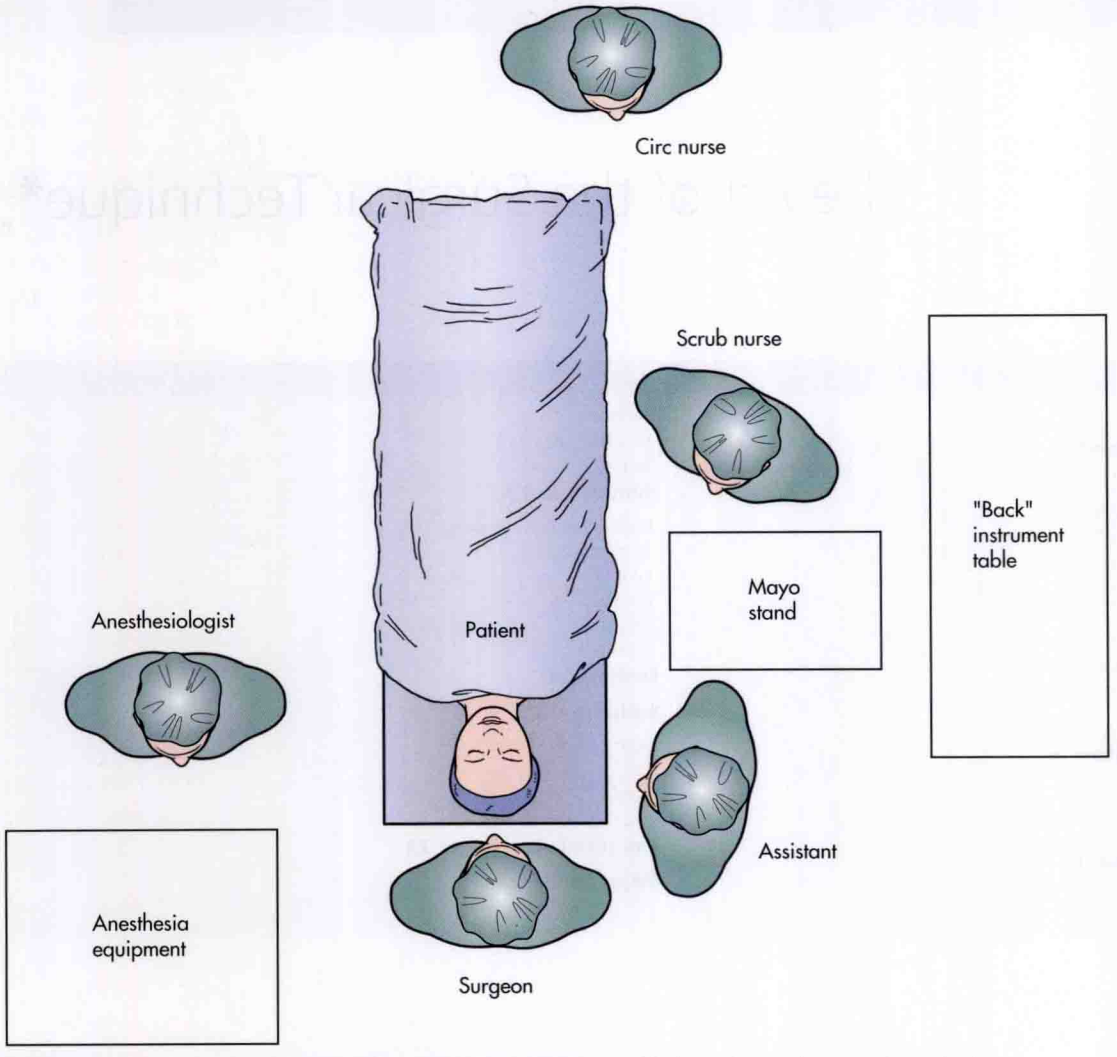

Figure 1-1 Typical operating room setup for an operation on right eye with the patient under general anesthesia.

Room setup

As part of your plan, you should know where the operating equipment will be placed. Generally, the setup is as shown in Figure 1-1. In most cases, the operated eye will be placed away from the anesthesia equipment. The surgeon will sit at the head of the bed. The assistant will sit at the side of the bed corresponding to the operated eye. For some procedures, you may find it easier to sit at the patient's side (for example, lateral tarsal strip and lateral orbitotomy). Feel free to move throughout the case and be comfortable. The nursing table will be on the same side as the assistant, but to the side of the bed.

Equipment setup

For the majority of operations that you perform, you will be in the sitting position. Adjust your chair to the appropriate height with your feet flat on the ground. If you are planning to move around the patient during the operation, as in an orbital floor exploration for a blowout fracture, you may want to stand for the operation. If so, consider step stools to make the assistant and surgeon relatively the same height.

Once you have decided whether you will be sitting or standing, you should position the operating room table. Often it is helpful to angle the head of the table away from the anesthesia equipment. Remember to consider where the operating room overhead lights are when positioning the table. Adjust the table height so that your elbows are bent slightly more than 90 degrees. Make sure that the patient's head is at the top edge of the operating table so you won't have to lean over the patient.

Do your best to position the patient for the comfort of both the patient and yourself. When operating on children, your view will improve if you place a towel roll under the patient's shoulders to hyperextend the neck, bringing the face into the same plane as the table. Older patients with neck arthritis may require a roll under the head for comfort. Markedly kyphotic patients may need a pillow under the neck and shoulders for comfort. You may have to operate standing at this patient's side with the head of the bed elevated. Do your best to maintain reasonable posture. Many older surgeons have to alter or stop their surgical practices because of the neck aches and back pains that result from years of poor body mechanics.

If you expect significant venous bleeding, as in nasal surgery, put the patient in about 10% of reverse Trendelenburg position (head up, feet down) before adjusting the table height. Once the table is at the chosen position and height, make sure that it is locked into position.

If you are using an operating microscope, this is the time to make adjustments to the scope and your chair. There are several possible positions for the operating scope base, but the most common is off the shoulder of the patient opposite to the eye you are operating on. Set the base of the scope to allow for full range of the arm. Make gross adjustments on the microscope height. Set the interpupillary distance of the microscope heads for the surgeon and the assistant. Set the focus of the microscope. If you are doing a conjunctival or canalicular procedure, set the focus of the microscope in the middle of the range. If you are doing deep orbital surgery, set the focus at the top of the travel so that you will be able to adjust the focus with the foot pedal to see deeper tissue without repositioning the operating scope as the dissection continues into the orbit. Most procedures will be performed without a wrist rest, but don't hesitate to use one if it increases your steadiness. Place any special sterile handles on the microscope before you scrub. If you plan to drape the scope, swing the microscope arm away without altering your microscope base position and have the scrub nurse drape the scope away from the operating field. Consider using sterile "baggies" over the handles rather than draping the whole scope to save time and money. Position the microscope and cautery foot pedals in the appropriate spot underneath the head of the table. If you don't do this, you will be surprised how many times you start the operation and reach for the cautery pedal, but find that it is not yet ready to use. Do all this before you leave to scrub.

Skin marking and local anesthesia

Many oculoplastic procedures require skin marking as a guide to incision placement. The majority of incisions will be *placed in natural skin creases* as in the upper lid skin crease for ptosis and blepharoplasty operations. Other skin incisions will be *placed adjacent to anatomic structures* to hide the scar. You should mark the skin before any local anesthetic is injected. Two good choices for marking eyelid skin are available: 1) gentian violet solution and 2) surgical marking pen. Gentian violet can be applied with the sharp end of a broken applicator used as a quill. With experience, you can draw a fine line that does not easily wash off with prepping, but this takes some experience to keep from making a mess. Usually, we use a thin-tipped surgical marker ("Twin-Tip" surgeon's marker, #6650-T, Hospital Marketing Services, Inc., http://www.hmsmedical.com). Be sure to degrease the skin with an alcohol wipe before marking.

You should use a local anesthetic with epinephrine for all procedures to provide some hemostasis (due to the vasoconstriction). The most common local anesthetic mixture is 2% lidocaine (Xylocaine) with 1:100,000 epinephrine in combination with 0.5% bupivacaine (Marcaine). Some surgeons choose to add hyaluronidase to the mix, but I have not found this necessary. For larger scalp and face procedures, you may want to consider "tumescent" anesthesia. Using this technique, a large amount of very dilute local anesthetic with epinephrine is injected into the subcutaneous tissues. This technique firms up the tissues and makes easier to develop flaps and perform liposuction. You won't need this for periocular procedures.

Local anesthetics sting badly (if you aren't feeling sympathetic, have a colleague inject 1 cc of local anesthetic into your eyelid; you will not soon forgot how it feels). Two factors are thought to be responsible: 1) a difference in pH and 2) distention of the tissues during rapid injection. To minimize the pain, try injecting a tiny amount—about 0.1 cc—into two or three places and then massage the local anesthetic into the tissues. After a few seconds, inject more anesthetic *very slowly*. This greatly minimizes the pain. Some surgeons buffer the local anesthetic using 1 part 7.5% sodium bicarbonate in 9 parts of 2% Xylocaine with epinephrine (2 cc of bicarb in 20 cc of Xylocaine). I have not found this worth the trouble, but many swear by it. You might want to try it. If you operate with an anesthesiologist, using appropriate agents, the patient can be made totally unaware of any local injection.

Remember to inject just beneath the eyelid skin. Avoid placing the needle into the muscle to prevent a hematoma, which may make intraoperative adjustments of the eyelid difficult; this is especially true with ptosis correction. For an upper eyelid procedure, such as a blepharoplasty or ptosis repair, you should inject 1–1.5 cc of local anesthetic mix.

Topical solutions are available that provide anesthesia. You should know about these two preparations: EMLA cream and Betacaine gel. EMLA cream should be applied in a thick coating 1 hour ahead and covered with an occlusive dressing (topical lidocaine 2.5% and prilocaine 2.5%, AstraZeneca LP, http://www.astrazeneca-us.com). Betacaine gel (topical lidocaine 5%, Canderm Pharma, Inc., http://www.canderm.com) can be applied for 20–30 minutes ahead without an occlusive dressing. Both preparations provide anesthesia, but no vasoconstriction, so usually additional local injection with epinephrine is required for surgical procedures. Topical agents are also useful prior to Botox or filler injections and can be helpful in children. Overdosing with systemic reaction is unlikely, but possible. Most of the time, I do not use these preparations, but you might find them helpful in your practice.

The majority of eyelid and lacrimal operations can be easily performed under local anesthesia. If you choose to operate without the benefit of an anesthesiologist, you should consider intravenous (IV) sedation to minimize the patient's anxiety. Doses of midazolam (Versed) in 0.5–1.0 mg increments are reasonable to achieve some relaxation. I find it helpful to have a Versed drip running rather than giving intermittent doses of the medication (1–3 mg/hour). Some surgeons prefer preoperative oral sedation with 2–10 mg of oral Diazepam (Valium). Additional pain relief can be given intraoperatively using small doses of a narcotic, such as morphine (1–2 mg IV). Intravenous alfentanil (Alfenta) is useful because of its short duration, but keep in mind that this is a very potent narcotic and a highly abused drug. Avoid oversedation to the point that the patient has lost inhibitions and gets restless or is too sleepy to follow your instructions. A supportive attitude from you and the nursing staff is often as helpful, or more helpful, than intravenous sedation. I am always impressed how many postop patients comment how helpful it was to have the circulating nurse offer to hold hands during the case. The nurse can also alert you when the patient is feeling discomfort.

If your operating situation allows for the efficient use of monitored anesthesia care, your anesthesiologist can medicate your patient to the point at which there is no memory of any pain from the injection and often no memory of the entire operation. The downside of this is more staffing and increased patient cost.

Preparing and draping the patient

In most hospitals, the patient can be prepped while you scrub. This gives time for the local anesthetic to take effect. A traditional Betadine scrub applied in concentric rings away from the planned surgical excisions, repeated three times, provides adequate cleaning of the skin. A surgical stockinet can be used to keep the patient's hair out of the operating field. If the patient's hairline is particularly low or close to the operating field, tape can be used to pull the hair away from the surgical field. If the patient is awake, you will want to prep out the entire face for most procedures under local anesthesia. If the patient is asleep, prep out two eyes whenever there is a need to obtain symmetry between the two sides or if forced duction testing may be required. A good general rule is to prep out a larger area than you think you will need.

Instruments

In the next sections of the chapter, we will discuss several types of surgical instruments. These instruments include:

- Scalpel blades and other cutting tools
- Scissors
- Forceps
- Retractors
- Cautery
- Suction
- Needle holders
- Sutures

You are undoubtedly familiar with several variations of each of these instruments. I will explain the instruments that I have found most useful in my practice. You may already have your own favorite tools for specific jobs, or you may choose to use the instruments that I have suggested.

You will notice that a particular instrument is available in *different lengths and caliber*. In general, *the length of the instrument is related to the depth of the surgical incision in which the instrument will be used*. Most of the eye instruments are only 4 inches long. These instruments are not used in deep incisions and are rarely used for incisions deeper than the eyelid. Similarly delicate instruments used for neurosurgery are much longer, often measuring 12 inches. An example is the curved Yasargil scissors used in optic nerve sheath fenestration. These instruments are 9 inches long and have a finer tip than the familiar Westcott scissors that you may find for eye and cardiac surgery. Ideally, for an optic nerve procedure, we would use a 6 inch instrument, but none is currently available in this scissor type so we make do with the longer instrument. The caliber or strength of the instrument will vary, depending on what tissue is going to be manipulated or cut. We will talk more about the individual variations of each of these instrument types later in this chapter.

Cutting the skin

Hand position

Now that you are properly positioned at the head of the bed of a patient who has been prepped and draped, your next job is to make a skin incision. Remember you are positioned with your *feet flat on the ground and your elbows at your side in flexion slightly more than 90 degrees*. Hold your hands in the *functional position*, like holding a pencil with your hand in slight flexion at the wrist. This will improve your dexterity and strength.

There are three tools used for cutting the skin:

- No. 15 scalpel blade
- Colorado microdissection needle
- CO_2 laser

Most of our comments not only pertain to the traditional scalpel, but also to the cutting cautery needle and CO_2 laser. It is worth learning the traditional surgical techniques with the scalpel and scissors. As your skill increases, you will likely find that using the microdissection needle or laser shortens the operating time.

As you hold the scalpel with the *pencil grip*, you will notice that, on the scalpel handle, there is a groove or flat area where your index finger will rest. The scalpel is supported between your thumb, index finger, and middle finger (Figure 1-2).

The eyelid skin is mobile. Precision cutting requires immobilization of the skin with the help of your fingers or the assistant's fingers. Use your ring finger to rest on the patient, stabilizing the skin or guiding your hand. Learn to use the ring finger on your dominant hand and the thumb and forefinger on your nondominant hand to stabilize the skin (Figure 1-3). If the tissue is slippery, using a gauze pad for some traction will be helpful.

It is best to start the skin incision with the tip of the scalpel blade. As you move across the incision, lay the scalpel down so that you are cutting with the curved part of a no. 15 blade. As the wound edges start to separate, observe the depth of the wound. Ideally, you want to cut eyelid skin only and not extend the cut into the orbicularis. This is difficult to do, but nevertheless worthwhile. Controlling the depth

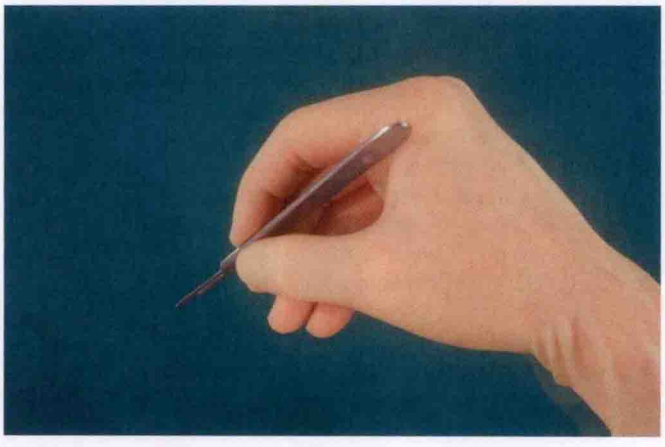

Figure 1-2 Holding the scalpel with the pencil grip. Note that the hand is in the "functional position" in slight flexion.

of any eyelid incision is critical. Remember that the eyelid is only slightly more than 1 mm thick at the skin crease, and you do not want to extend your incision into the cornea. You might find that using a corneal protector is a useful safeguard initially. With experience, you will probably find it easier not to use a corneal protector for scalpel cutting or cutting cautery incisions. Adjust the pressure to maintain the proper depth of the wound. Like driving a car, look "down the road," as you pull the scalpel across the skin. All of this is happening as you or your assistant holds steady tension on the skin. Remember, tight skin can be cut more easily and accurately than more mobile skin. Like most instruments for eye surgery, the scalpel is a "finger tool." As you bring your fingers toward your palm with the scalpel tip, you may need to reposition your hand and repeat the cutting process in lengths of the wound (Figure 1-4). As you get more experienced, you will be able to flex your fingers and move your hand at the same time.

This is a good time to remind you of your *good body position*. You should feel relaxed and at ease as you cut. Make sure your elbows remain close to your side rather than up high, which will convert the scalpel to an "arm tool" rather than a "finger tool." You will be doing many incisions in your life, so learn to cut away from important structures such as your fingers and the eye. There are several types of scalpel blades that you should be familiar with.

Scalpel blades

- No. 11 blade: This blade has a sharp point that is good for tight angles and curves. It is not useful for longer incisions because it may cut deeper than you expect.
- No. 15 blade: This is the best all-purpose scalpel blade for eyelid and facial skin; 98% of your eyelid surgery with a scalpel will be done using a no. 15 blade.
- No. 10 blade: The no. 10 blade is shaped like a no. 15 blade except bigger. This blade is used primarily for thicker skin incisions. It is not used for periorbital incisions, but can be helpful in facial flaps.
- Beaver blades (http://www.bd.com) The #66 Beaver blade (#376600) is a special purpose right-angled blade. Its primary use is for making cuts in tight spaces. It is especially useful for nasal mucosal incisions in dacryocystorhinostomy (DCR) procedures. Angled keratomes designed for anterior segment surgery work in a similar fashion (Figure 1-5). Other useful blades are the #64 blade (#376400 rounded tip, sharp on one side), #76 blade (#376700, a mini #15 blade), both useful for delicate shaving of tissue off sclera or cornea. The needle blade #375910 is good when you need to make a microincision. Beaver handles come in a variety of lengths, the most common being 10 cm. Longer length handles (13 and 15.5 cm) are useful for deep orbitotomy or craniotomy cases.

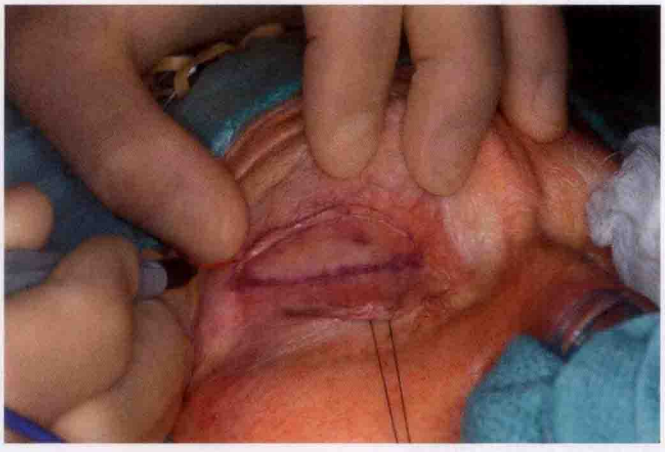

Figure 1-3 Skin stabilization. During upper eyelid blepharoplasty, the skin fold is stabilized and stretched with the surgeon's fingers while the upper eyelid is drawn downward using a lid margin traction suture. Note that a Colorado microdissection needle* is being used for the incision. With experience, the traction suture can be eliminated and the surgeon can use fingers to stretch the skin tight.

*The original micropoint electrocautery needle was called the "Colorado" needle. Other brands of true microdissection needles are now available. In this text, the terms Colorado needle and microdissection needle are considered to be the same. However, this fine tungsten microtipped needle should not be confused with the older needle point monopolar cautery tool available in many operating rooms.

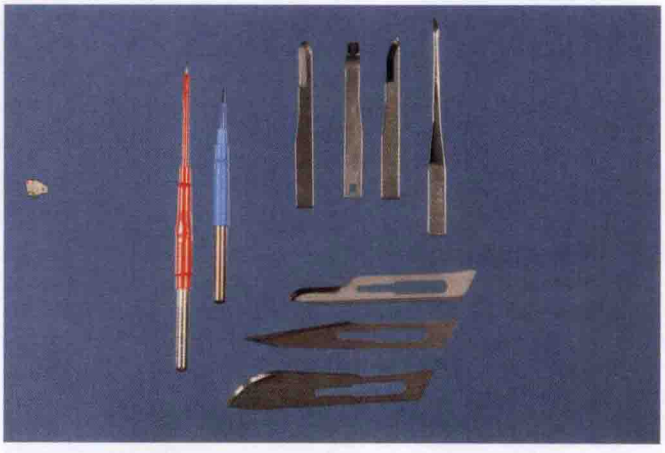

Figure 1-5 Surgical cutting instruments: Left, "Colorado" microdissection needles (blue: shorter (preferred); red: longer). Right, Beaver blades 376400, 376600, 37600, 375910. Bottom (from top), scalpel blades no. 15, no. 11, and no. 10.

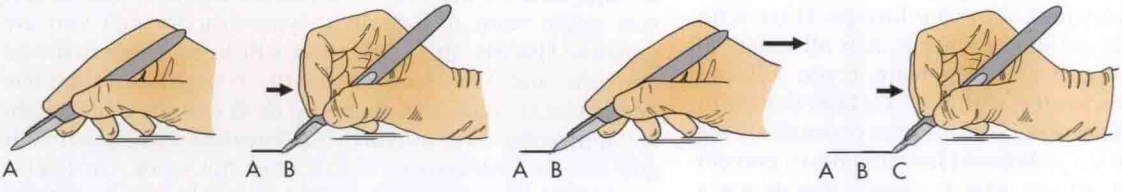

Figure 1-4 Flexion of the fingers with the scalpel blade followed by movement of the hand (adapted from Edgerton M, *The art of the surgical technique*, Baltimore, 1988, Williams & Wilkins).

Other cutting tools

Two other useful cutting tools are available for eyelid surgery: the microdissection needle and the CO_2 laser. The microdissection needle has been my choice for the majority of periocular surgical procedures in recent years. This unipolar cautery device does an excellent job of cutting and cauterizing the thin eyelid tissues. The needle is made of tungsten with an extremely fine tip. Tissue in contact with the tip is vaporized. Getting used to this instrument takes some practice. Cutting the tissue should be done with superficial light passing over the tissue in a "painting" motion with the needle slightly angled as if you are using a paint brush. If you find that carbon is building up on the tip of the instrument, you are moving too fast, you are cutting too deep, or you have the power turned up too high. The trick of using this tool is cutting only at the very tip so that there is little thermal damage to the surrounding tissues. Using a "blend" mode gives cutting and cautery. Try this for the dissection of an upper eyelid blepharoplasty skin muscle flap. Once you get used to this "bloodless" field, you will have trouble going back to scissors. You should use a smoke evacuator to eliminate the hazardous smoke produced by this tool. The patient requires grounding as with the use of other unipolar cautery equipment. The use of this unipolar cutting tool is sometimes limited to tissues anterior to the orbital septum, because the electric current is carried into the orbit and causes pain for many patients under local anesthesia. The tip works on the dry eyelid skin, but works best on tissues deep to the skin. For this reason, some surgeons prefer using a blade for the initial skin incision as the wound is sharper. I use a blade in many cosmetic cases and switch to the needle for any deeper work. You may find the Colorado needle with a foot pedal useful, but I prefer the hand switch on the cautery handle itself. Two companies make a microdissection needle (Stryker Colorado needle, Stryker Medical, http://www.stryker.com, 800 869 0770; and Tungsten microsurgical needle E1650, Valleylab, http://www.valleylab.com, 800 722 8772). The shortest length needle is the easiest to work with on periocular tissues.

The CO_2 laser is also a useful tool for cutting eyelid skin. Like the microdissection needle, tissues are vaporized with excellent cautery of capillaries and small veins. The Coherent UltraPulse 5000C CO_2 laser was introduced years ago and remains a work horse in my practice. The current model is the UltraPulse Encore made by Lumenis (Lumenis Inc., http://www.lumenis.com, 801 656 2300). These lasers remain the gold standard for laser incisional and resurfacing work. As when using a microdissection needle, large vessels are often cut with the laser rather than cauterized, so you will need a bipolar cautery tool on the operating room table as well. Both these cutting and cauterizing tools can shorten operating times considerably. If you have a CO_2 laser available, you should try this as a cutting tool. You must emphasize "pulling apart the tissues" with your forceps. There is no "touch" or "feel" involved in the cutting. It is all visual so technique is very important. Once you learn it, you will love it. Patients have less discomfort with the CO_2 laser than with the Colorado microdissection needle. Some precautions are necessary. You will need sandblasted instruments to prevent reflection of the laser energy. Metal corneal shields are a must. Surgeons and staff must wear protective goggles. Smoke evacuation is necessary. Care with oxygen and the use of wet drapes are important to prevent fire. The majority of procedures in this text will be described with the use of the microdissection needle, but I suggest you try the laser, especially for upper blepharoplasty. The skills that you will learn using the microdissection needle and the laser are complementary; learning one will help you with the other.

Placement of skin incisions

Most skin incisions that you will make are hidden in natural creases or wrinkle lines (Figure 1-6). The *upper lid skin crease* is a natural place to make incisions in the upper lid. The upper lid skin crease will often be carried laterally into a "laugh line." If you are working away from an area where you are not familiar with the wrinkle lines, ask the patient to contract the facial muscles in that area. You will see wrinkles and folds in the skin that will show you where to place your incisions. You can anticipate these lines. Remember that the natural skin creases occur perpendicular to the direction of the muscle fibers causing this crease. Contract your frontalis muscle and you will see the furrows of the forehead perpendicular to the frontalis muscle fibers.

Other skin incisions can be camouflaged by placing them near anatomic structures such as the eyelashes or eyebrow. Adults generally have no lower lid skin crease. Skin incisions in the lower lid are usually placed *adjacent to the lower lid lashes* (subciliary incision). This incision can also be carried laterally into a "laugh line." Similarly, eyebrow incisions can be hidden by placing the incision *adjacent to the upper or lower margin of eyebrow hairs*. Incisions can be placed within the brow itself but can cause permanent visible scarring as a result of the loss of cilia roots. Other examples of camouflaging scars near facial structures include pretrichial hairline incisions, preauricular skin incisions, and incisions along the alae of the nose. Older style incisions such as the Stallard Wright lateral orbitotomy incision and the Lynch incision have been largely replaced by incisions that leave a better scar.

Anxiety and tremor

Every surgeon has a tremor to some degree or another. This tremor will be worse when you are anxious, are tired, or have drunk too much coffee. If you find that your tremor is bothersome, try to eliminate these factors. I occasionally hear of a resident who takes a beta-blocker before performing an operation. This might serve as a confidence booster, but is really not necessary once you learn to relax during surgery. A big part of being anxious when learning surgery is the feeling that you will look bad to your teacher or others observing. Consequently, you get more nervous and your tremor will increase. Don't forget, everyone in the operating room is on your side, doing everything they can to help you do your best for the patient. If you are feeling a little shaky, you might want to explain to your teacher that you are nervous. Usually, this confession will bring some deserved empathy, and your tremor will settle down a bit. Take a few deep breaths. Make sure that your chair and the table height are appropriate. Try to relax your forearms and loosen your grip on the instruments. If this does not work, consider a wrist rest. *I have yet to see a student who had a tremor that kept him or her from being a good surgeon.*

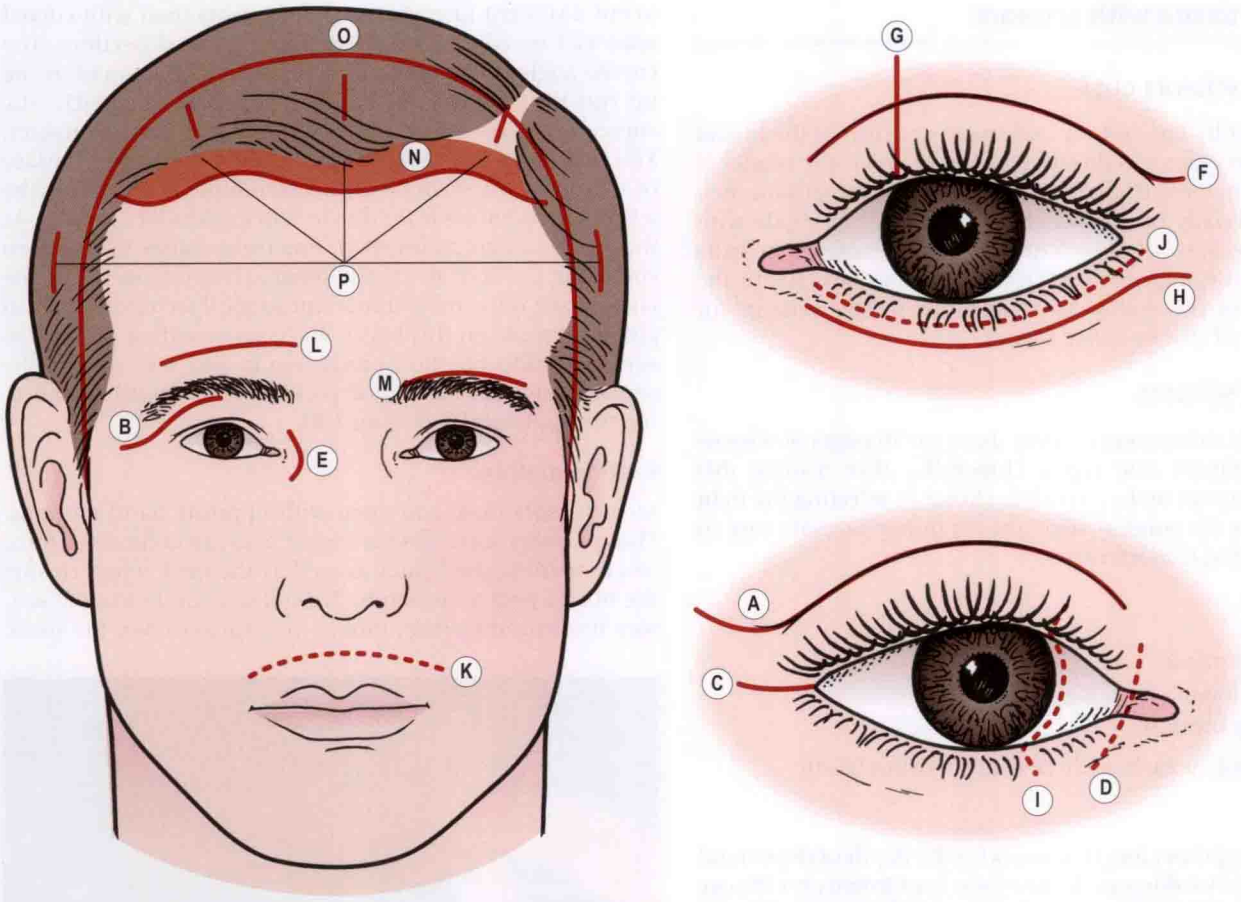

Figure 1-6 Facial incisions are typically hidden in natural skin creases or placed next to anatomic structures for camouflage. (**A**) Upper lid crease incision extended into lateral canthal laugh line for lateral orbitotomy. (**B**) Traditional Stallard Wright lateral orbitotomy incision (rarely used). (**C**) Modified Berke lateral canthotomy incision. (**D**) Transcaruncular incision. (**E**) Frontoethmoidal (Lynch) incision (rarely used). (**F**) Upper lid crease incision. (**G**) Vertical lid split incision. (**H**) Subciliary incision. (**I**) Transconjunctival incision for medial orbitotomy. (**J**) Inferior transconjunctival incision. (**K**) Gingival upper buccal incision. (**L**) Forehead furrow incision. (**M**) Suprabrow incision. (**N**) Pretrichial incision. (**O**) Transcoronal forehead incision. (**P**) Endoscopic browplasty incisions.

Checkpoint

- Remember to have a plan when you enter the operating room. Let the staff know what the plan is. Know what the room setup will be. Know the instruments. Your preparedness will inspire confidence and set the pace for the operation.
- You must have a plan for the operation and some contingencies if things don't go as planned. You would be surprised how many residents come to the operating room expecting to be "shown" what to do. As a resident, the more you know, the more you will get to do, and the faster you will learn.
- Get the patient, operating table, your stool, and your body in a comfortable position before starting. Have all the equipment prepared before you make a skin incision.
- Why should you mark the skin and inject the local anesthetic before scrubbing?
- Do you need to write down the names of special instruments, sutures, or equipment that you will be using?
- Let the operating room nurses know what you are planning, especially if you anticipate any change from the routine.
- Practice stabilizing and cutting the skin on pieces of chicken at home. It is not the perfect model, but it can be helpful. Practice everything you can at home, including cutting, suturing, and tying. Operating room time is very valuable.
- Learn to be comfortable and relaxed in the operating room. As a surgeon, it is your home and workplace for a big part of your career.

Cutting tissue with scissors

How do scissors cut?

Scissors cut by the *shearing and squeezing action* of the blades crossing so close together that tissue between the blades is separated in a controlled fashion. The majority of skin incisions, especially on thicker skin, should not be made with scissors because of this "crushing action" of the scissors blades. Some surgeons do, however, use scissors to cut the thin skin of the eyelid. Most surgeons reserve scissors for dissection of deeper tissue planes.

Types of scissors

In the Storz instrument catalog, there are 50 pages of scissors showing almost 200 types. Hopefully, after reading this section, you can make a sensible choice in selecting the right scissors for the surgical step you are doing. Scissors vary in the following characteristics:

- Length
- Caliber
- Tip sharpness
- Blade design
- Cutting motion

We will look at each of these characteristics briefly.

Length

Choose the proper length scissors for the depth of the wound that you are working in. Most of the instruments on the eye tray are 4 inches long. This size goes with the scale and depth of the usual ocular procedures. Longer instruments would be less steady and bump into the microscope. You will use many 4 inch instruments in oculoplastic surgery. Plastic surgery instruments are usually 6 inches long and fit the normal hand size better. In most cases, the longer neurosurgical instruments are not useful. For orbit surgery, on occasion, you may use a longer neurosurgical scissors for the particular tip rather than the length (Yasargil scissors).

Caliber

In general, thicker scissors blades are used for tougher tissues. This is fairly intuitive. You would not use a delicate Westcott scissors to cut through the thick dermis of the cheek. Similarly, you would not use the tough Mayo scissors to cut eyelid skin. Remember it is the blade tip size, not the length of the instrument, that you should consider for the delicacy of the tissue you want to cut. You will find that many longer delicate instruments are available.

Tip

The tip of a pair of scissors may be blunt or sharp. Blunt-tipped scissors are usually used for dissection in tissue planes. Sharp scissors are used to cut through tough tissues such as scar tissue. Face lift scissors have slightly sharpened rounded tips to facilitate flap dissection in the subcutaneous plane.

Blade design

Scissors blades are made as *straight* or *curved* (Figure 1-7). Most straight scissors are used for cutting sutures and bandages, and are sometimes called "suture scissors." It is easier to cut a straight line with straight scissors than with curved scissors. Curved scissors are useful for tissue dissections. The curved angle of the blade lifts the tissue planes apart as the tip cuts the reflected tissue, which is placed on stretch. The curve of a scissors blade is easy to palpate through tissues. You will learn to protect tissues against the convex surface of the curve. An example of this technique is separating the levator aponeurosis from the underlying Müller's muscle. As the two layers are *pulled apart*, fine tissue bands will be seen stretching between the tissue planes (learning to "pull" the layers apart is the most important surgical technical tip I can give you; more on this later). The convex surface of the scissors can slide up the fibrous bands and rest against the aponeurosis. Cutting can be performed without buttonholing the aponeurosis (Figure 1-8).

Cutting motion

Most scissors close and open with opposite hand motions. These scissors are called *iris scissors*. You can control the force when opening the blades as well as the force when closing the blades with your hands. This allows you to use the scissors tips as a dissecting tool as you spread open the tissue

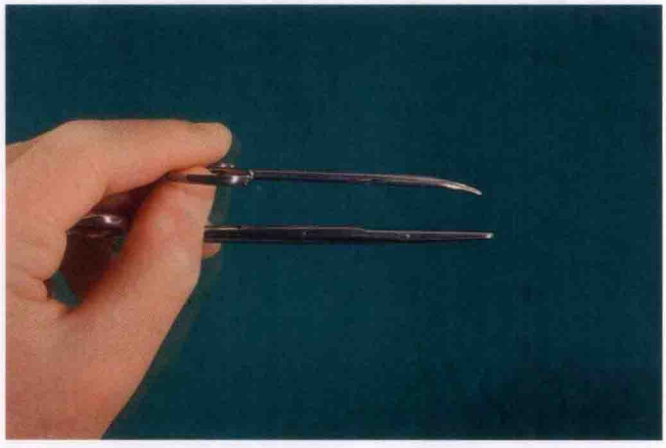

Figure 1-7 Blades of the straight Mayo scissors compared with those of the curved Stevens tenotomy scissors. Notice that the length and caliber of the scissors are also different.

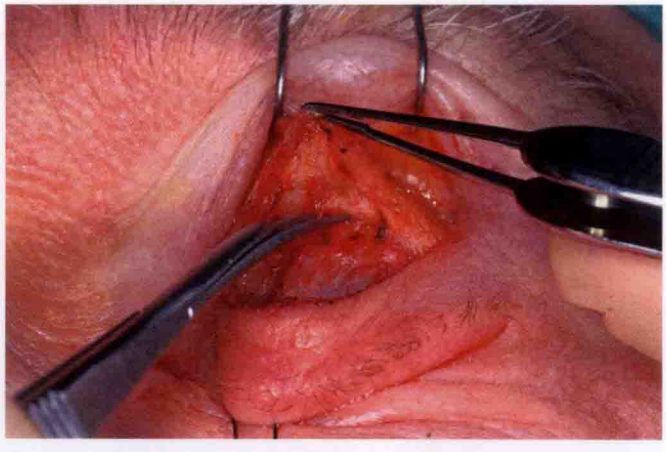

Figure 1-8 Dissection of levator aponeurosis from Müller's muscle using curved Westcott scissors. Note how "pulling" the tissues apart creates bands of tissue that are easy to see and cut. The convex side of the scissors blades should be against the tissue that is the strongest, in this case the aponeurosis (see Figure 1-10, B).