



Surgical Pearls for the General Dermatologist

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Absolute Dermatology · Richmond VAMC Dermatology · VCU Dermatology

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Posted version: the patient photographs and video shown in the talk are omitted.

Disclosures

- No relevant financial relationships to disclose.
- Patient photographs and video appear with the patients' consent.

Objectives

- Briefly review skin and flap biomechanics: tension, restraint and dog-ears
- Review literature-based techniques that improve outcomes and help in trouble areas
- Present a novel technique for cyst excision

THE KEY PRINCIPLE

The outcome is decided by how
tension is managed



SECTION 1

Skin and flap biomechanics



Where tension and restraint come from

- The skin itself: elasticity varies with age, sun damage and site.¹
- Its tethers: fibrous septae bind skin to fascia, muscle and bone. The restraint is site-specific.²
- Undermining helps only when it frees the tether.²
- Orientation: parallel to the tension lines, a wound needs less force to close and benefits more from undermining.³

Tissue Movement— A Macrobiomechanical Approach

LEONARD M. DZUBOW, M.D.

Dzubow • J Dermatol Surg Oncol 1989



Studies of the Excisional Wound: I.
Biomechanical Effects of Undermining and
Wound Orientation on Closing Tension and
Work

Michael F. McGuire, M.D.

McGuire • Plast Reconstr Surg 1980



Types of restraint

- Lateral restraint- from the attached skin that trails the advancing edge⁴
- Superior/inferior restraint- from the attached skin superior and inferior to the advancing edge⁴
- Deep restraint- from the structures underlying the advancing edge and its trailing tissue (fibrous septae)⁴
- Indirect restraint- from things in the way of the advancing edge (i.e: excess tissue remaining in the defect)⁴
- Pivotal restraint- from rotational forces opposing closure of the apical angle⁴⁻⁶

Pivotal restraint: not just for flaps

- A flap rotating on its pedicle is tethered at its base. The restraint is generally exhibited at the point most distant from the pivot point (flap tip).⁵
- An ellipse behaves like two small flaps. The middle of each edge simply advances. Toward the ends, the tissue advances and rotates around the apex (pivot point).⁶
- The apex is a pivot point.⁶
- We undermine the tips to free pivotal restraint.⁷
- After undermining, most skin can rotate about 15° to the closure line without a significant dog-ear. Thin, pliable skin rotates further. Thick, stiff skin rotates less.⁶

*The Dynamics of Flap Movement:
Effect of Pivotal Restraint on Flap
Rotation and Transposition*

LEONARD M. DZUBOW, M.D.

Dzubow • J Dermatol Surg Oncol 1987



*The Dynamics of Dog-Ear
Formation and Correction*

LEONARD M. DZUBOW, M.D.

Dzubow • J Dermatol Surg Oncol 1985



Dog-ears: why standing cones form

- Length disparity: each edge's arc is longer than the closure line⁶
- Rotation: the wider the apical angle, the more the ends rotate and the higher the pivotal restraint pushing the standing cone upward.⁶
- Contour: over a convexity the ends tent up. It isn't a length problem, so a standard dog-ear repair won't fix it.⁶
- Standing cone vs lying cone¹
- Too much tension depresses the middle and lifts the ends.¹ This gives the “shark bite” appearance that patients hate.
- Unresected deep tissue or dermis can physically push up the tips.⁷

Figure shown in the live presentation

Dzubow 1985, Fig. 1A⁶

The Dynamics of Dog-Ear Formation and Correction

LEONARD M. DZUBOW, M.D.

Dzubow • J Dermatol Surg Oncol 1985



Dog-Ears: A Review

Weisberg et al. • Dermatol Surg 2000

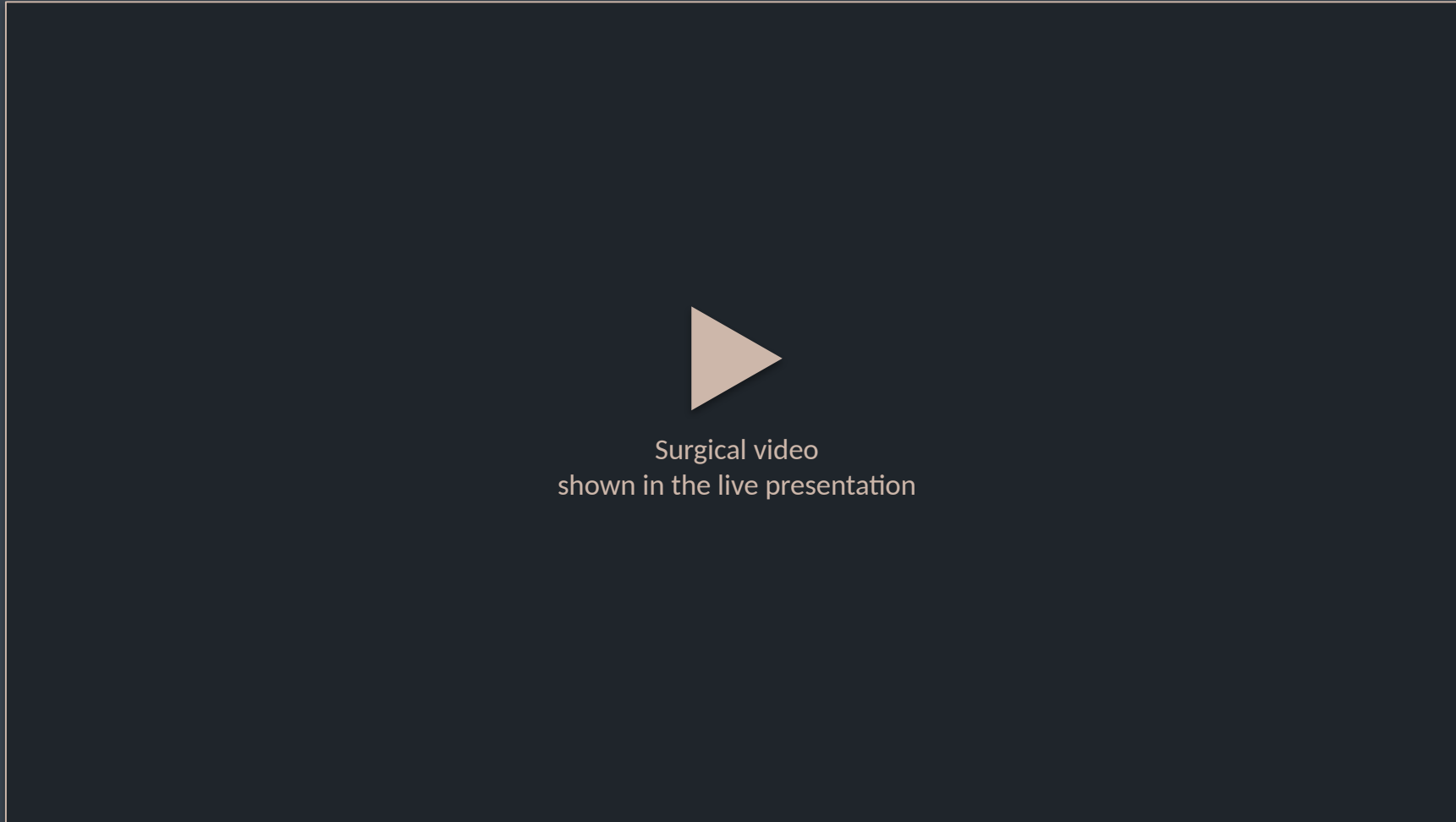


SECTION 2

Surgical planning



Don't fear the long incision



Surgical video
shown in the live presentation

For a given defect, a longer incision often distributes tension better than fighting for a short scar.

Surgical technique for optimal outcomes

Part I. Cutting tissue: Incising, excising, and undermining

Christopher J. Miller, MD,^a Marcelo B. Antunes, MD,^b and Joseph E. Sobanko, MD^a
Philadelphia, Pennsylvania, and Austin, Texas

Miller et al. • J Am Acad Dermatol 2015



TIPS for a better ellipse

John A. Zitelli, MD *Pittsburgh, Pennsylvania*

Zitelli • J Am Acad Dermatol 1990



Put the tension deep

Clinical photographs
shown in the live presentation

- Fascia (if necessary), then dermis and sub-Q, then epidermis.^{9,10}
- The goal is zero tension on the epidermal closure.¹⁰

Surgical technique for optimal outcomes

Part II. Repairing tissue: Suturing

Christopher J. Miller, MD,^a Marcelo B. Antunes, MD,^b and Joseph E. Sobanko, MD^a
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Miller et al. • J Am Acad Dermatol 2015

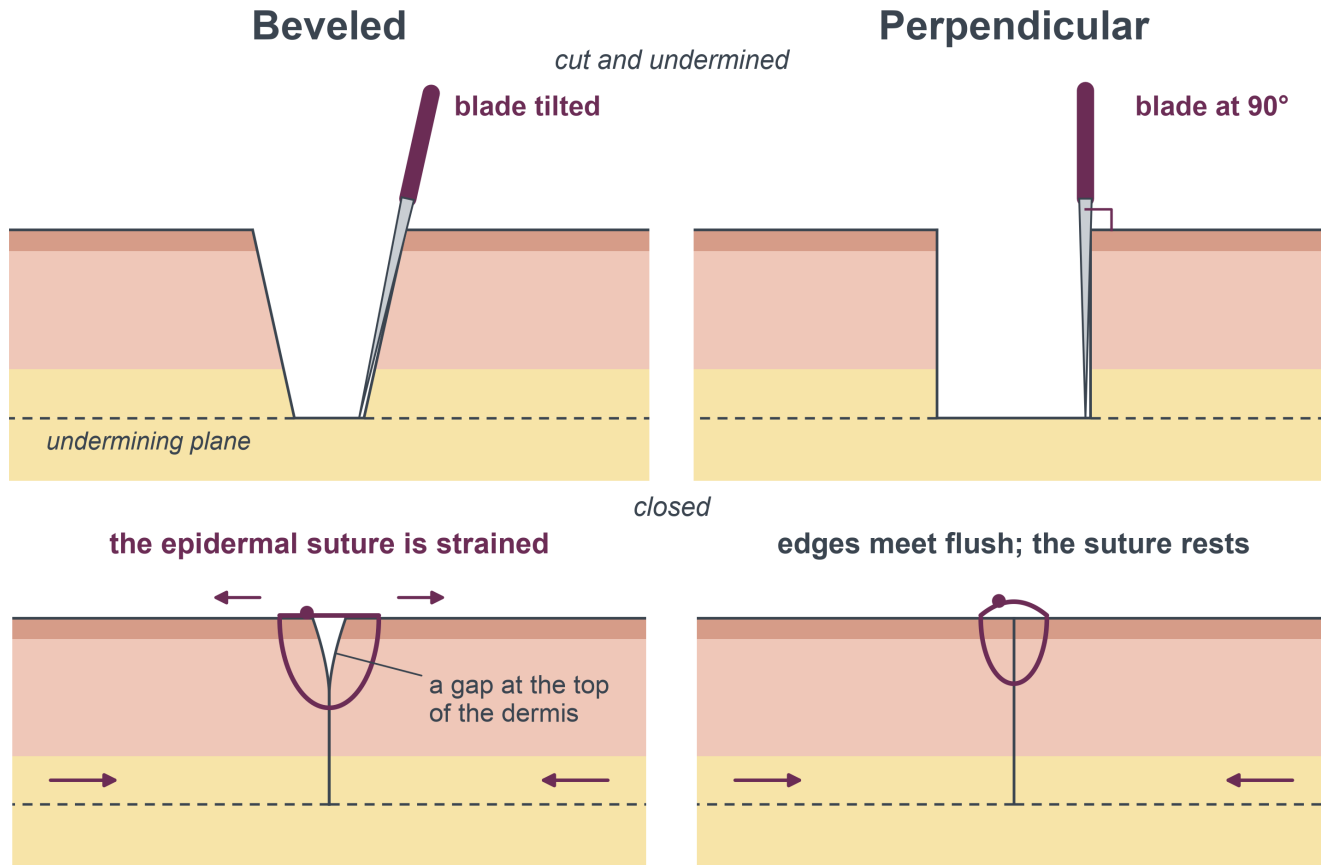


SECTION 3

The excision



Don't bevel



A bevel leaves dermis and fat sloping toward the center of the wound.

- Keep the blade perpendicular to the skin surface.⁸
- A beveled edge makes epidermal apposition extraordinarily difficult — and pushes tension onto the sutures.⁸
- **DON'T BEVEL!**

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Miller et al. • J Am Acad Dermatol 2015



Undermine the tips



Surgical video
shown in the live presentation

Not just to the tips: free them fully.^{7,11} There's little lateral restraint there — but there is pivotal restraint.

TIPS for a better ellipse

John A. Zitelli, MD *Pittsburgh, Pennsylvania*

Zitelli • J Am Acad Dermatol 1990



Undermining in Cutaneous Surgery

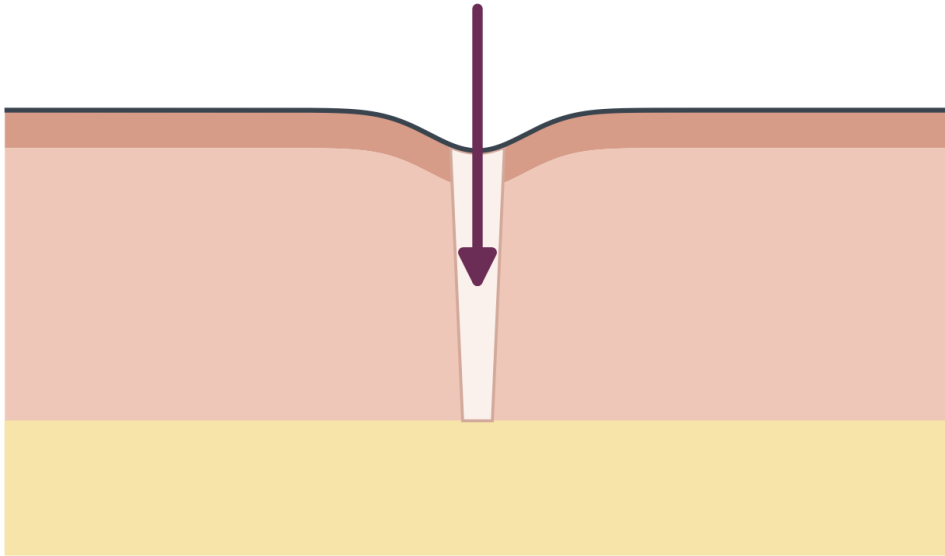
JOHN D. BOYER, MD, JOHN A. ZITELLI, MD, AND DAVID G. BRODLAND, MD

Boyer et al. • Dermatol Surg 2001



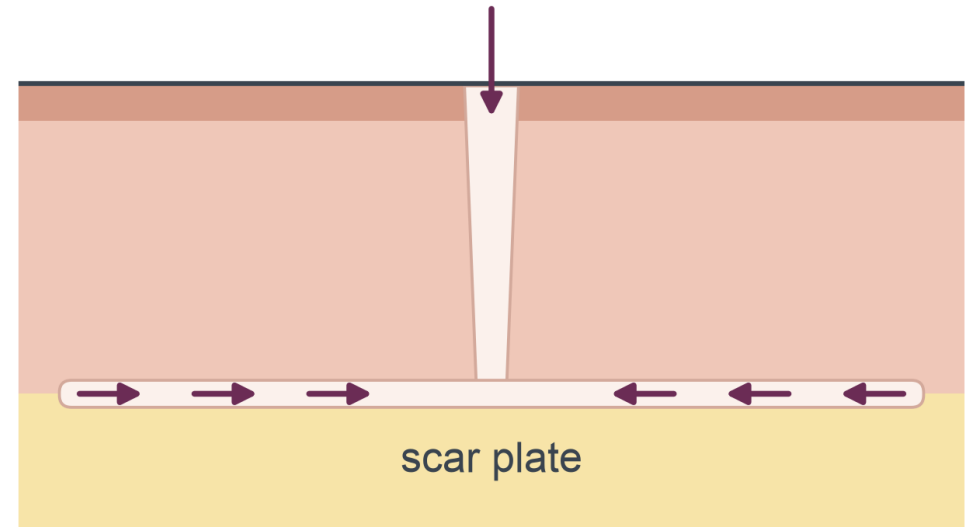
Wide undermining: a scaffold for the scar

No undermining



Contraction is focused in the vertical plane of the incision: the line pulls down.

Wide undermining



A platelike scar spreads contraction across the subdermal plane: less pull on the line.

After Boyer, Zitelli & Brodland, Dermatol Surg 2001

Trim the fat, debevel the edge



Surgical video
shown in the live presentation

- Trim excess fat and any beveled dermis so the edge stands square.⁸
- This is very quick and is time well spent because of the reduced frustration during dermal suturing.

Surgical technique for optimal outcomes

Part I. Cutting tissue: Incising, excising, and undermining

Christopher J. Miller, MD,^{1*} Marcelo B. Antunes, MD,^{2*} and Joseph E. Sobanko, MD³
Philadelphia, Pennsylvania, and Austin, Texas

Miller et al. • J Am Acad Dermatol 2015



SECTION 4

The deep closure: fascia and subcutaneous tissue



Fascial plication



Surgical video
shown in the live presentation

- Fold fascia on itself using deep bites^{9,12}
- It needn't close the wound completely, but only unload the dermal closure.⁹

The Fascial Plication Suture: An Adjunct to Layered Wound Closure

Kantor · Arch Dermatol 2009



Introducing the Bi-Pli Stitch: A New Surgical Technique to Relieve Tension in Large Surgical Defects

Yag-Howard & DeNigris · Dermatol Surg 2022



The tacking suture



Surgical video
shown in the live presentation

- A buried vertical plus one bite of deep fascia (or fat) at the center¹³
- Closes the potential space
- May help to avoid hematoma in at-risk patients

Tacking Sutures in Facial Reconstruction: A Systematic Review and Proposal for Revised Nomenclature

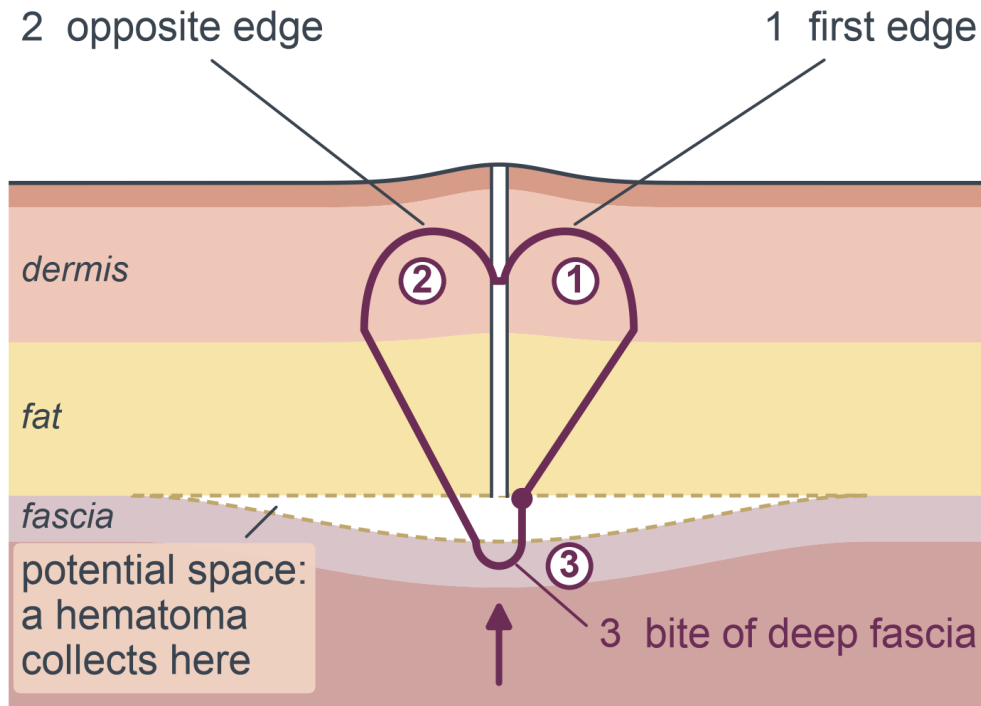
Ramiz Nayyer Hamid, MD, MPH,* Meagen-Helen Henderson Berg, MDCM, MSc,* Kimberly Shao, MD,* and Heidi Baca Donnelly, MD*†

Hamid et al. • Dermatol Surg 2026



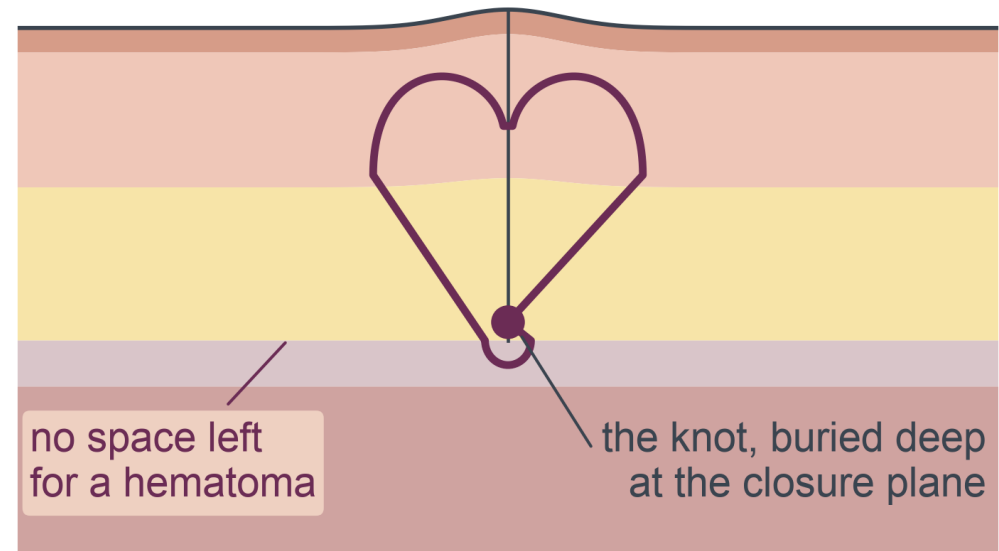
Closing the potential space

Placed



A buried vertical mattress (1, 2), plus one bite of deep fascia at the center of the wound (3).

Tied



Tied, it pulls the fascia up to meet the closed edges: the space under the flaps is gone.

SECTION 5

The dermal closure



Eversion can improve cosmesis

- Everted edges move the pull 3–4 mm back from the wound edge.⁷
- With the tension nearest the skin surface set back from the edge you have a better opportunity to seal the epidermis under no tension.

Clinical photographs
shown in the live presentation

TIPS for a better ellipse

John A. Zitelli, MD *Pittsburgh, Pennsylvania*

Zitelli • J Am Acad Dermatol 1990

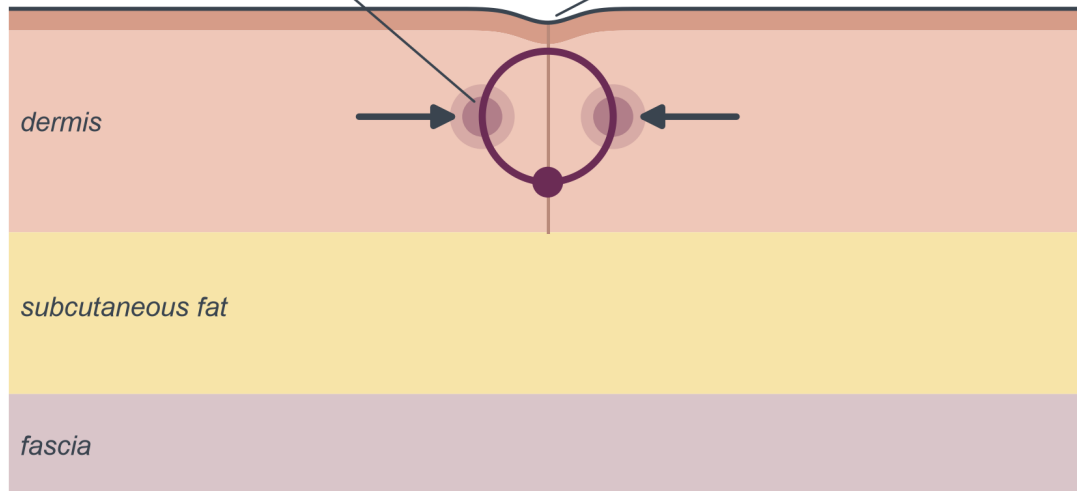


Where the suture pulls

Flat closure

the suture pulls side to side —
right at the edge

edges roll in

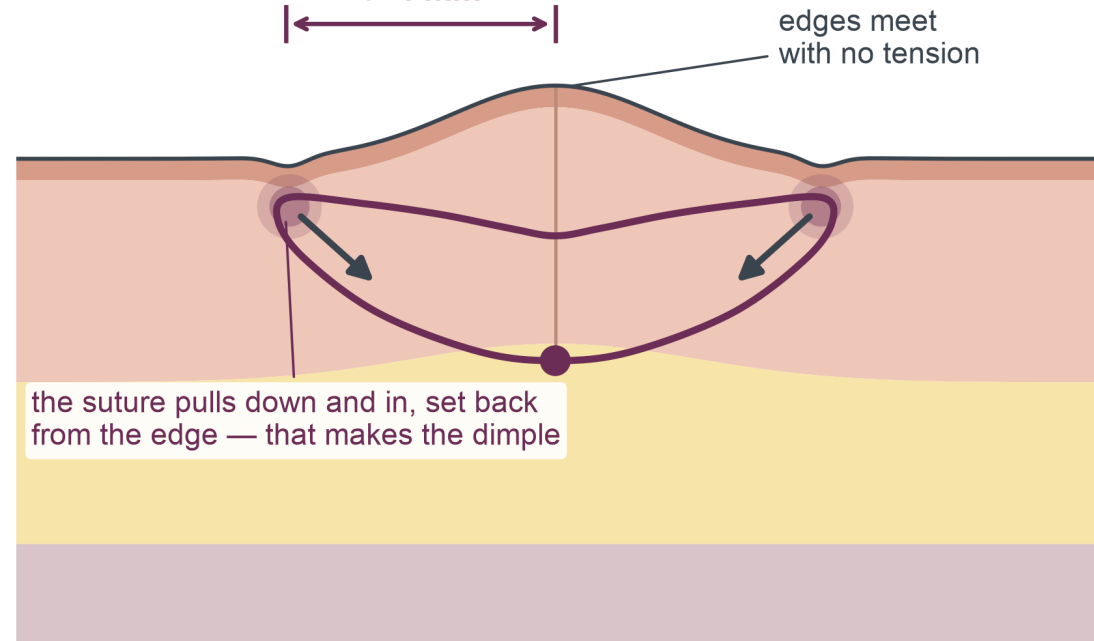


The pull lands at the edge.
The edges roll in and the scar spreads.

Everted closure

3–4 mm

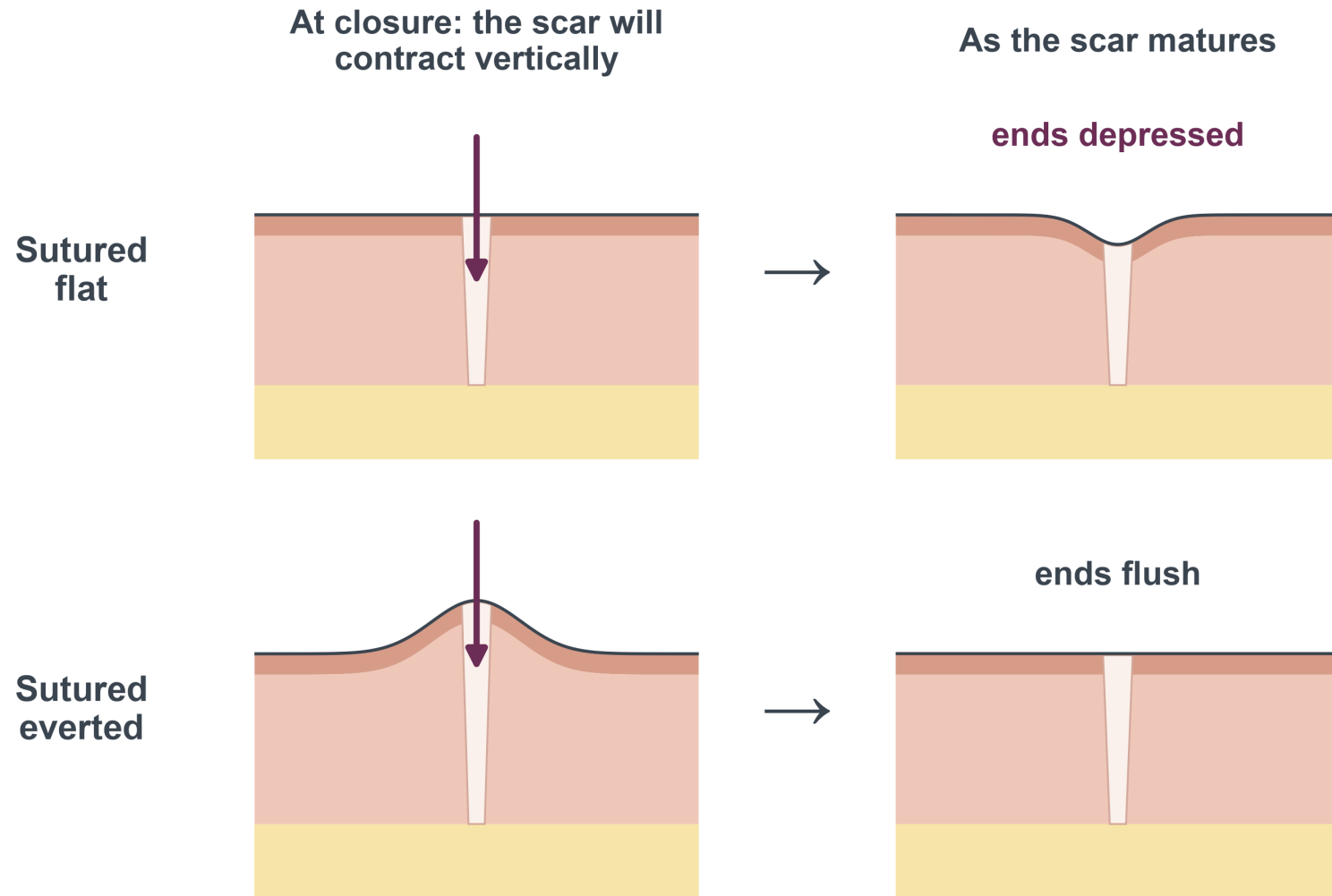
edges meet
with no tension



the suture pulls down and in, set back
from the edge — that makes the dimple

The pull lands 3–4 mm back. The edges meet
with no tension, and the ridge settles flat.

As the scar matures



After Zitelli, J Am Acad Dermatol 1990

The buried vertical mattress

- Watch for the snap.
- The optimal needle path will result in the tissue edge snapping back into place¹⁰
- If there is no snap there will likely be a gap¹⁰



Surgical video
shown in the live presentation

Surgical technique for optimal outcomes

Part II. Repairing tissue: Suturing

Christopher J. Miller, MD,^{1*} Marcelo B. Antunes, MD,^{2*} and Joseph F. Sobanko, MD³
Philadelphia, Pennsylvania, and Austin, Texas

Miller et al. • J Am Acad Dermatol 2015



SICM: a dermal pulley



Surgical video
shown in the live presentation

- Two buried verticals side by side, 1–2 mm apart¹⁴ or the tissue bunches.
- Very useful on backs and scalps.¹⁵

Novel Surgical Approach to Subcutaneous Closure: The Subcutaneous Inverted Cross Mattress Stitch (SICM Stitch)

CYNDI YAG-HOWARD, MD, FAAD*

Yag-Howard • Dermatol Surg 2011



The Subcutaneous Inverted Cross Mattress Stitch (SICM Stitch) in Our Experience

Jeon et al. • Dermatol Surg 2013



The subcutaneous inverted looped horizontal mattress stitch

- Reverse the needle for the second throw¹⁶
- Make sure suture tails are twisted before the second throw¹⁶
- Splits the tension¹⁶ and everts better than SICM.



Surgical video
shown in the live presentation

How We Do It: The Subcutaneous Inverted Looped Horizontal Mattress Stitch:
A Novel and Efficient Design for High-Tension Dermal Closures

Clark et al. • Dermatol Surg 2021



SECTION 6

At the surface



Follow the needle's curve

Figure shown in the live presentation

- Enter at at least 90° and follow the needle's curve.
- A: wider deep than at the surface. The pull is even and the edges evert.
- B, C: too wide and too shallow. The pull goes sideways and the edge inverts; C leaves suture marks.

Start and finish through the same hole



Surgical video
shown in the live presentation

- Technique helps to avoid one edge of the closure riding over the other at the ends¹⁷
- Can help to reduce dog ears¹⁷

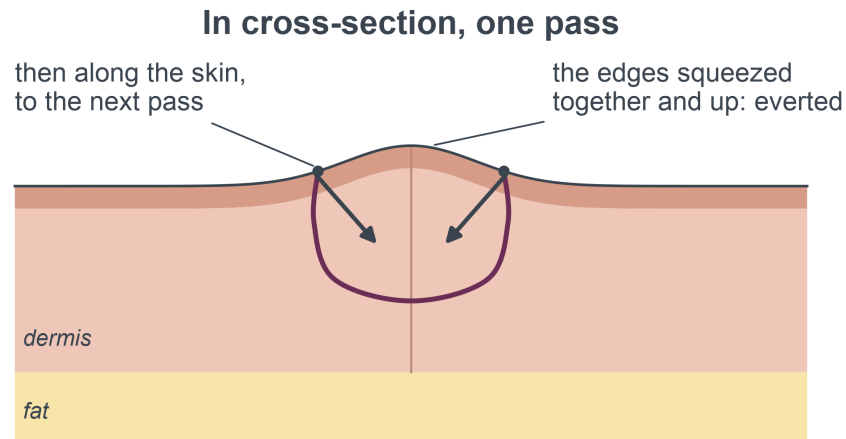
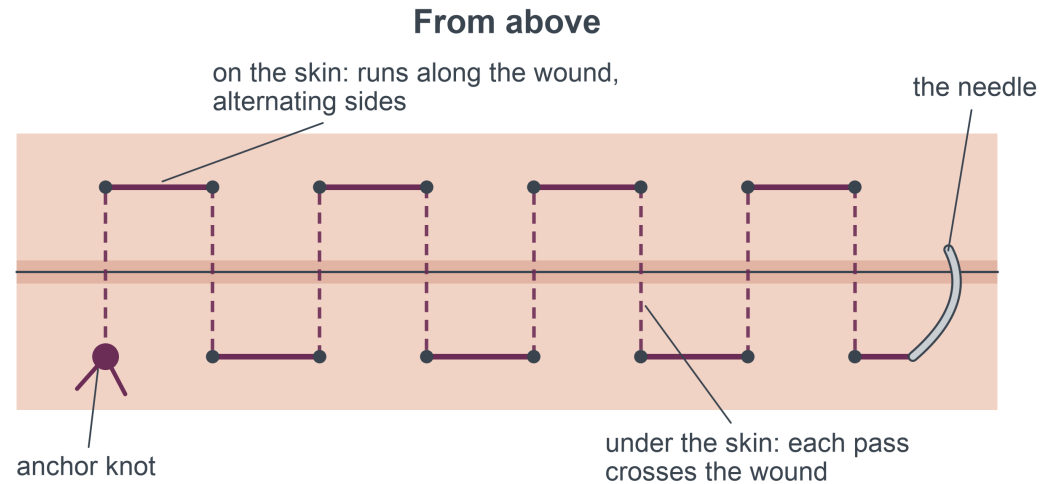
Modification of the Running Suture to Avoid Wound Edge Protrusion

KRISTEN L. TOREN, MD,* G. TODD BESSINGER, MD, PhD,[†] AND JASON D. MARQUART, MD*

Toren et al. • Dermatol Surg 2011



Running horizontal mattress



- A way to force eversion¹⁸
- If placed too tightly can strangulate the tissue edge^{10,18}
- Can produce hemostasis for dermal bleeders, but can seal off egress for bleeding in the SQ

Surgical Pearl: Running horizontal mattress suture with intermittent simple loops

Steven Q. Wang, MD,^a and Leonard H. Goldberg, MD, FRCP^{a,b}
Houston, Texas

Wang & Goldberg • J Am Acad Dermatol 2006



Surgical technique for optimal outcomes

Part II. Repairing tissue: Suturing

Christopher J. Miller, MD,^a Marcelo B. Antunes, MD,^b and Joseph E. Sobanko, MD^c
Philadelphia, Pennsylvania, and Austin, Texas

Miller et al. • J Am Acad Dermatol 2015



Intermittent simple loops



Surgical video
shown in the live presentation

- Alternate simple running with horizontal mattress.¹⁸
- The suture crosses the line where nursing can snip.¹⁸

Surgical Pearl: Running horizontal mattress suture with intermittent simple loops

Steven Q. Wang, MD,^a and Leonard H. Goldberg, MD, FRCP^{a,b}
Houston, Texas

Wang & Goldberg • J Am Acad Dermatol
2006



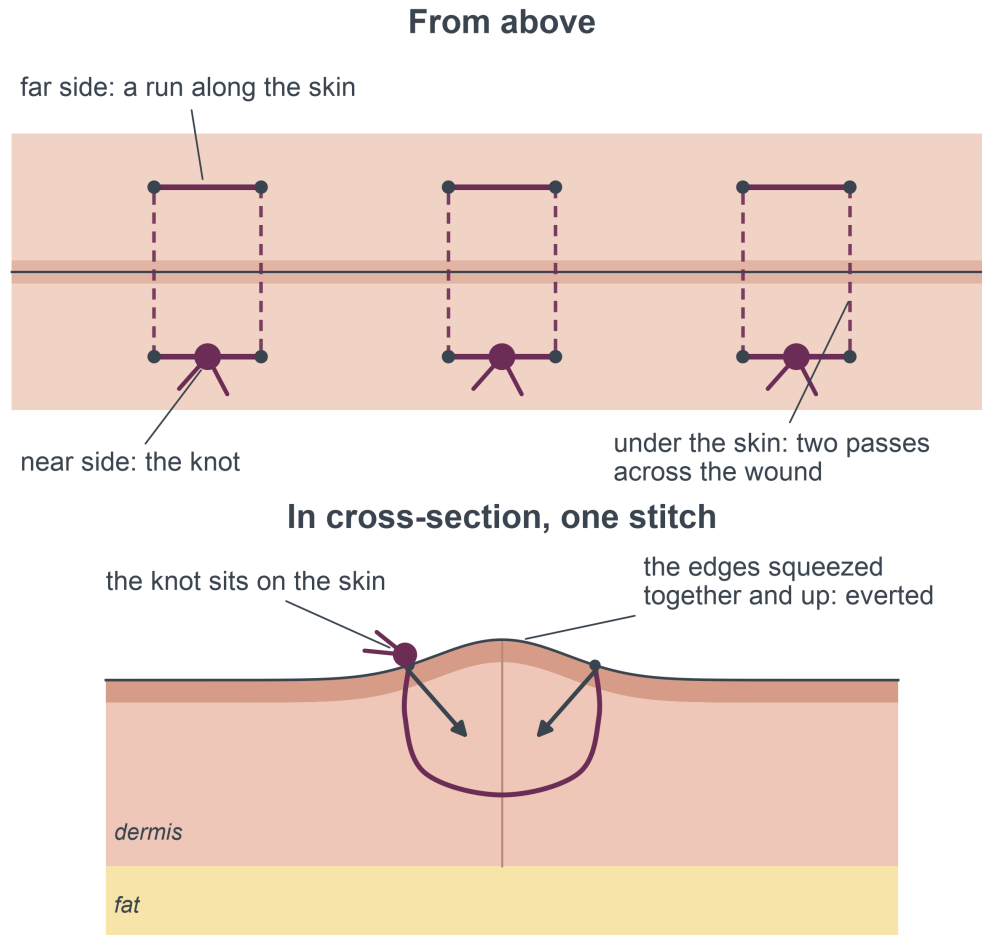
The needle spin



Surgical video
shown in the live presentation

Loosen your grip; let the suture's drag turn the needle in the Adsons to load it backhand.

Interrupted horizontal mattress



- The cost: knots bury as the tissue swells.
- Nursing may have to re-anesthetize to get them out.

SECTION 7

Cysts: two techniques of my own



Pilar cyst: the arciform flap

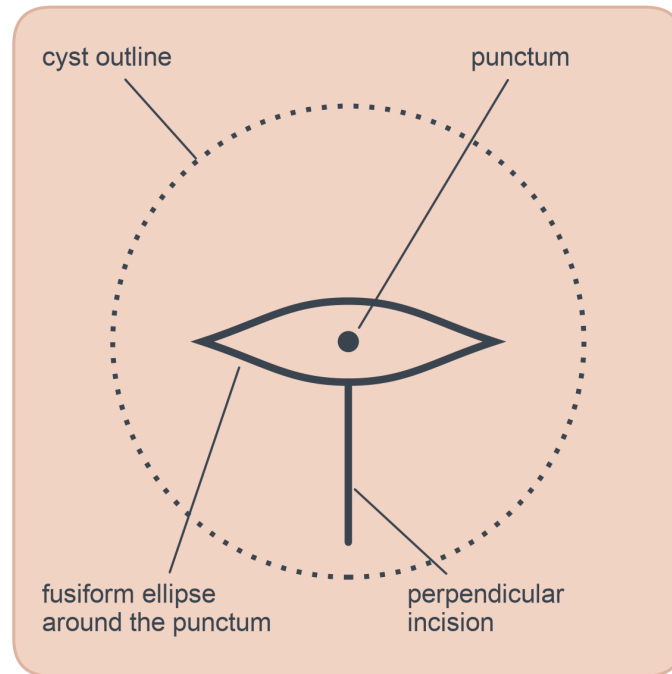


Surgical video
shown in the live presentation

- A curved incision over the lateral cyst.
- Still no normal skin removed.
- Far better access.

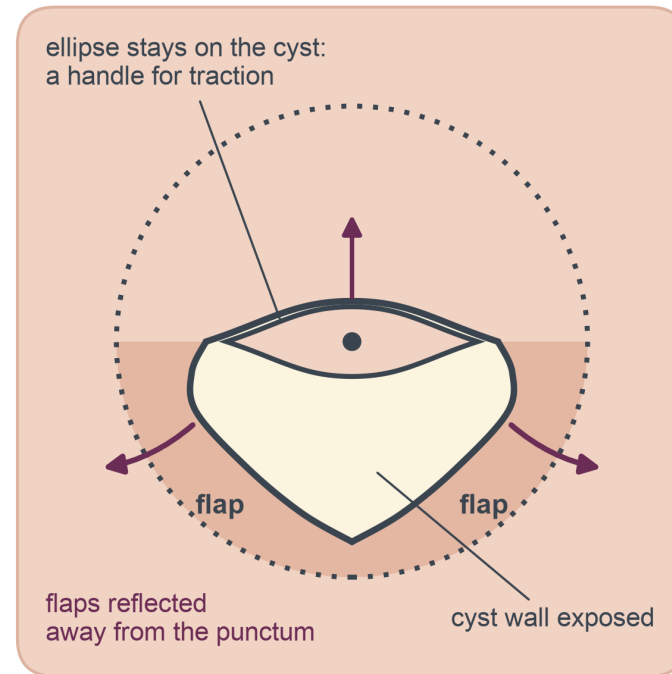
Epidermal cyst: the T-flap cyst excision

1 Design



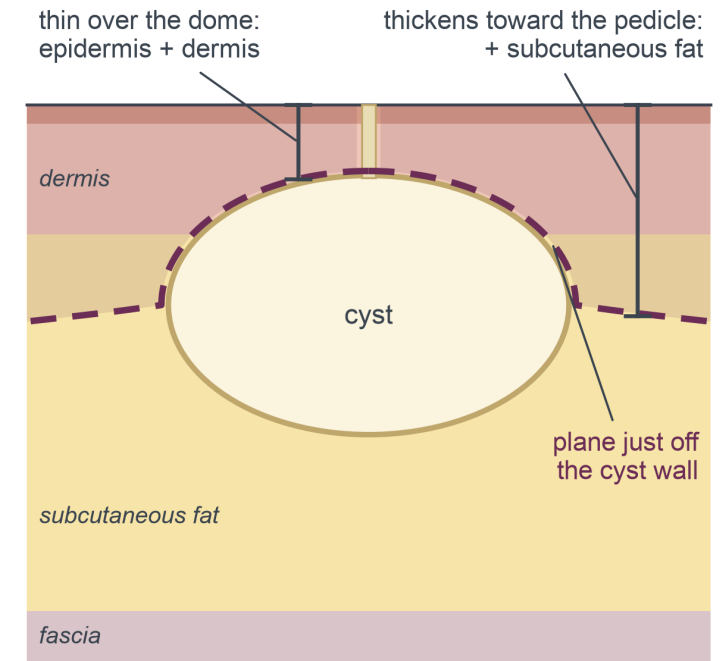
Excise a fusiform ellipse around the punctum;
incise perpendicular toward the far side.

2 Reflect the flaps



Keep the ellipse on the cyst as a handle.
Reflect two flaps away from the punctum.

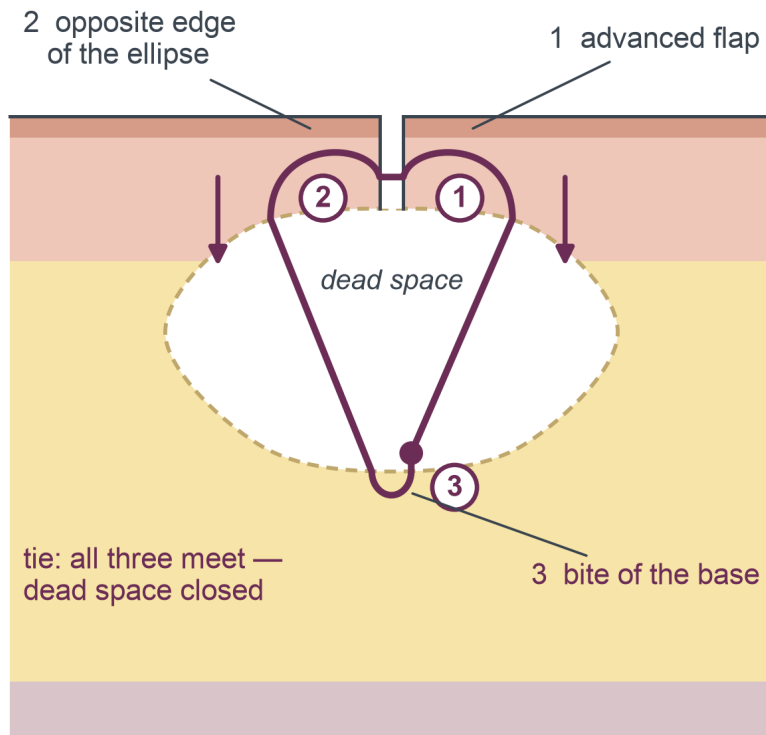
3 Plane of elevation



Just off the cyst wall: thin over the dome,
thickening with fat toward the pedicle.

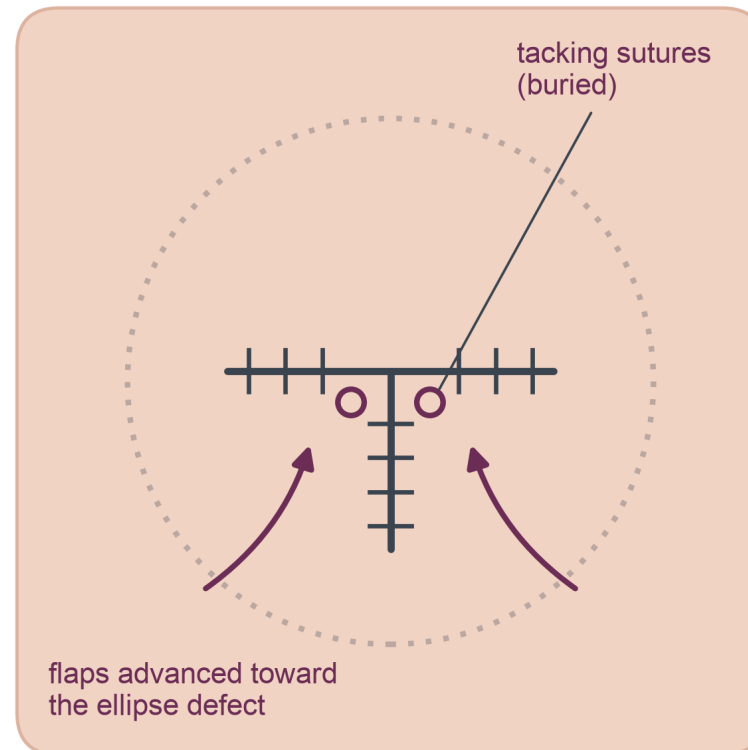
The T-flap cyst excision: closure

4 Three-point tacking suture



Flap → opposite ellipse edge → base, then tie.
One each side. Closes the dead space.

5 Closed: a T



Least normal tissue removed; widest exposure for removal and hemostasis.

The T-flap cyst excision



Surgical video
shown in the live presentation

- A fusiform ellipse around the punctum
- A perpendicular stem to create two flaps
- The ellipse is your handle.

SECTION 8

Totally unrelated



Punch-pop



Surgical video
shown in the live presentation

Fenestrate bare cartilage so
granulation comes through
from behind.¹⁹

[How We Do It: "Punch-Pop" Single-Instrument Punch Fenestration of Cartilage to Augment Healing by Granulation, a Video Walkthrough](#)

Abidi et al. • Dermatol Surg 2019



Take home

- Tension management is the name of the game. Move the tension to deeper structures if possible.
- Don't worry about the length of the scar. Focus on creating the optimal scar.
- If you can only perfect one thing make it the buried vertical mattress.

References (1 of 2)

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Thank you

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