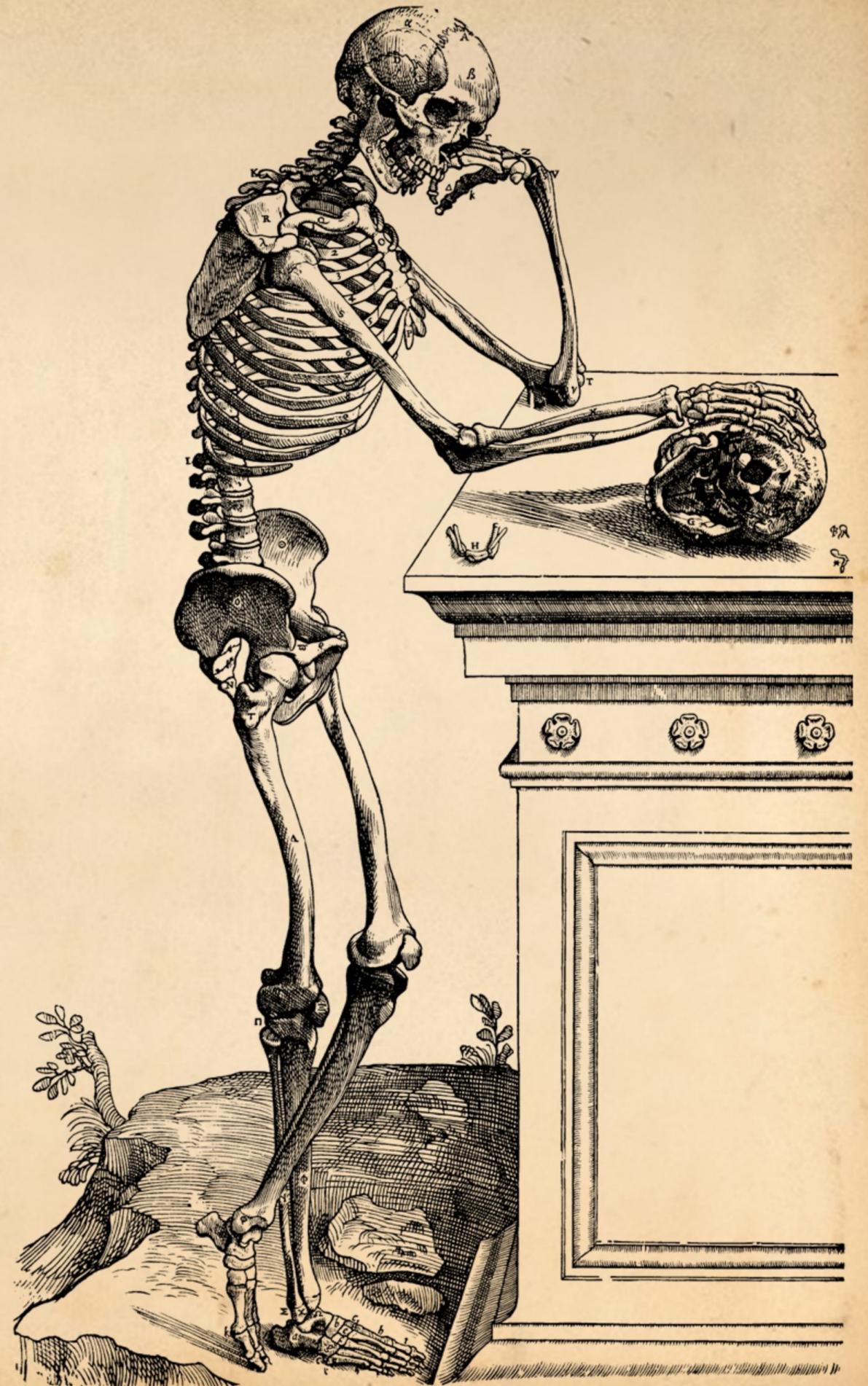


DEBRIDEMENT

BIOLOGICAL & TECHNICAL
FOUNDATIONS OF THE
QUINTESSENTIAL
MODALITY OF
CURTAILING INJURY
AND EXPEDITING CURE IN
WOUNDS & INJURED TISSUES

CRITICAL CONCEPTS IN
SURGERY & WOUND CARE

Marc E. Gottlieb, MD, FACS • Phoenix, Arizona





DÉBRIS

of that which is broken
(from Latin *brisare*)

- Dictionnaire de l'Académie française, 1st Edition** • 1694
 ... **4th Edition** • 1762
 Les restes d'un vaisseau qui a fait naufrage.
What remains of a vessel that has been shipwrecked.
- JF Féraud: Dictionnaire critique de la langue française** • 1787
 Au propre, les restes d'un édifice, et sur-tout d'un vaisseau qui a fait naufrage.
Properly, the remains of a structure, and especially a shipwrecked vessel.
- Dictionnaire de l'Académie française, 5th Edition** • 1798
 Les restes d'un vaisseau qui a fait naufrage, d'un bâtiment ruiné, d'un palais détruit, d'une ville saccagée.
The remains of a shipwrecked vessel, a ruined building, a destroyed palace, a sacked village.
 Débris, se dit figurément Du bien qui reste à un homme après un grand revers de fortune, et des troupes qui restent après la défaite d'une armée, d'un régiment, etc.
Figuratively, whatever good remains of a man after a great reversal of fortune, and the men left after defeat of an army or regiment, etc.
- Dictionnaire de l'Académie française, 6th Edition** • 1835
 Il se dit Des restes d'une chose brisée, fracassée, ou détruite en grande partie.
It says the remains of something broken, smashed, or largely destroyed.
- Émile Littré: Dictionnaire de la langue française** • 1872
 1. Reste d'une chose brisée. 2. Fig. Ce qui reste de ce qui a été détruit.
 1. *The remains of something broken.*
 2. *Figuratively, what is left of what has been destroyed.*
- Dictionnaire de l'Académie française, 8th Edition** • 1932
 Reste d'une chose brisée ou en partie détruite. Il se dit figurément de Ce qui reste d'une chose après sa ruine, sa destruction, son abolition; du Bien qui reste à quelqu'un après un grand revers de fortune; des Troupes qui restent après la défaite d'une armée, d'un corps, etc.
Remains of something broken or partly destroyed. Figuratively, what remains of something after its ruin, destruction, abolition; whatever good remains of someone after a great reversal of fortune; the remaining troops after defeat of an army, etc.

“Débride” and “débridement” are not derived from “débris”.

DÉBRIDER

First use related to surgery circa 1842.

French DÉBRIDE • English UNBRIDLE

de - bride
remove the bridle

(Old Germanic *bridel*)

Débride
Débridement



French BRIDE • English BRIDLE

Dictionnaire de l'Académie française, 4th Edition • 1762

- Ôter la bride à un cheval. *Remove the bridle from a horse.* [LITERAL]
- Figur. dans le style familier, en parlant de certaines choses qu'on fait avec une extrême précipitation. *Figuratively, in familiar style, things done very precipitously or with urgency.* [FIG: UNLEASH, LET GO THE BRAKES]

Jean-François Féraud: Dictionnaire critique de la langue française • 1787

- Ibid. [LITERAL]; [FIG: UNLEASH]
- **Sans débrider**, adv. (Figuré.) Tout de suite et sans interruption. *Through to the end without interruption.* [FIG: WITHOUT STOPPING]
- **Débridement**, pour exprimer l'action de débrider. Ce Lexicographe a beaucoup de ces substantifs, forgés d'après des verbes. *Debridement, to express action of debridging. This lexicographer has many nouns forged from verbs.*

Dictionnaire de l'Académie française, 5th Edition • 1798

- Ibid. [LITERAL]; [FIG: UNLEASH]
- Il s'y joint alors une idée de repos, de cessation de mouvement. *From the literal joins an idea of repose, cessation of movement.* [FIG: CEASE, REST, HALT]

Dictionnaire de l'Académie française, 6th Edition • 1835

- Ibid. [LITERAL]; [FIG: UNLEASH]; [FIG: REST, HALT]; [FIG: WITHOUT A STOP]

Émile Littré: Dictionnaire de la langue française • 1872

- Ibid. [LITERAL]; [FIG: UNLEASH]; [FIG: REST, HALT]; [FIG: WITHOUT A STOP]
- **Terme de carrier.** Détacher le câble de la pierre. *Quarry term, detach the cable from the stone.* [BY ANALOGY]
- **Terme de chirurgie.** Pratiquer l'opération du débridement. *Surgery term, practice the operation of debridement.* [BY ANALOGY]
- **Débridement.** Terme de chirurgie. Opération consistant à enlever les brides ou filaments dont la présence dans une plaie met obstacle à la libre sortie du pus. *Term of surgery, operation consisting of removing the adhesions or filaments whose presence in a wound obstructs the free exit of pus.* • [1877]

Opération consistant à diviser un tissu membraneux ou aponévrotique qui comprime les plaies, ou à agrandir une solution de continuité pour donner issue à la suppuration. *Operation of dividing a tissue membrane or fascia that compresses wounds, or enlarge a break to give exit to pus.*

Dictionnaire de l'Académie française, 8th Edition • 1932

- Ibid. [LITERAL]; [FIG: UNLEASH]; [FIG: REST, HALT]; [FIG: WITHOUT A STOP]

- Par analogie, il signifie Dégager ce qui est serré. *By analogy, it means free what is tight or constricting.* [BY ANALOGY]
- **Débridement.** Terme d'Arts et de Chirurgie. Action de débrider. Le débridement d'une pierre. Le débridement d'une plaie. *Action of debridging, i.e. debridling, e.g. a stone or a wound.*

Dictionnaire de l'Académie française, 1st Edition • 1694

Frein, ce qui sert à gouverner un cheval. Le mors, les resnes & la testiere de la bride. mettre la bride à un cheval.

Brake, that which governs a horse - the bit, the reins, and the head-stall of the bridle.

Dictionnaire de l'Académie française, 4th Edition • 1762

La partie du harnois d'un cheval, qui sert à le conduire, & qui est composée de la têtière, des rênes & du mors.

The part of a horse harness which serves to lead, composed of head-stall, reins, & bit.

On dit figurément, Tenir quelqu'un en bride, pour dire, L'empêcher de faire ce qu'il veut.

Figuratively, hold someone to the bridle, meaning prevent him from doing as he wishes.

Dictionnaire de l'Académie française, 8th Edition • 1932

Partie du harnais d'un cheval ou d'un mulet, etc., qui sert à le conduire, et qui est composée de la têtière, du mors, des rênes.

The part of a horse or mule harness which serves to lead, composed of head-stall, bit, & reins.

Fig. et fam., Tenir quelqu'un en bride, Le contenir, surveiller sa conduite.

Figuratively, hold someone to the bridle, contain him, surveil his conduct.

DEBRIDEMENT

ORIGINS & DEFINITIONS

Historical & Linguistic Origins

Unbridle . . . unrestrain . . . *[original]*
Remove adhesions, filaments, sinews,
obstructions, constrictions,
membranes, fascias
[derivative].

Contemporary Definitions

Drain and evacuate.
Release and deconstrict.
Excise non-viable & morbid tissues.

Biological Basis

Detrimental effects of
injury, inflammation, necrosis.

Clinical Concepts & Purposes

- 1 - Arrest or eliminate disease.
- 2 - Expedite care and healing.

The Prime Principle

Remove the bad.
Leave the good.



Importance of natural eschar separation & therapeutic debridement



trauma & hematoma



reconstruction & flap



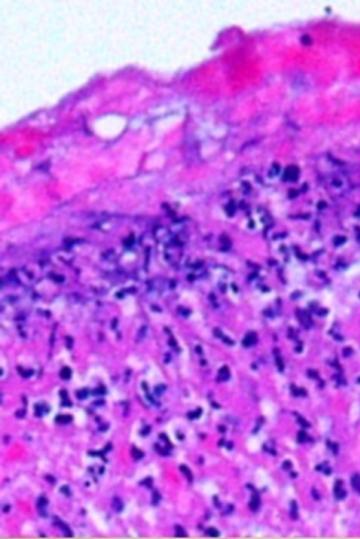
pressure



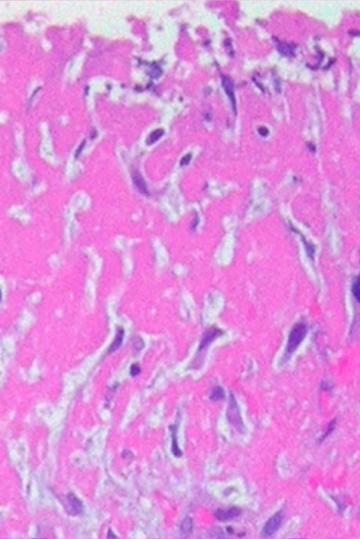
trauma & polymyositis



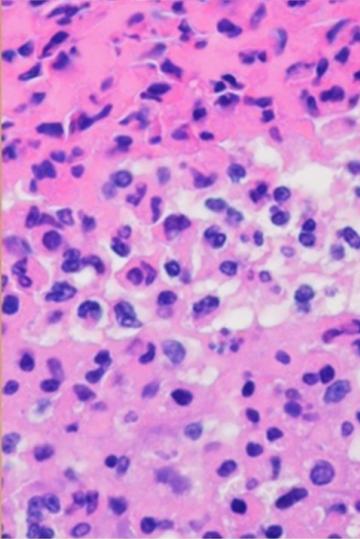
trauma & aso-pvod



0
Injury & inflammation
*Plasma proteins.
 Neutrophils.*



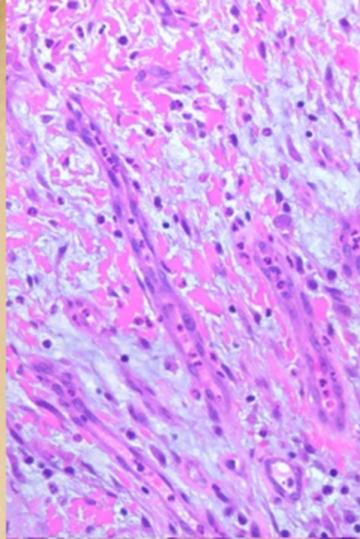
1
Inflammation Subsides
*Defensive, injurious.
 Induces repair.*



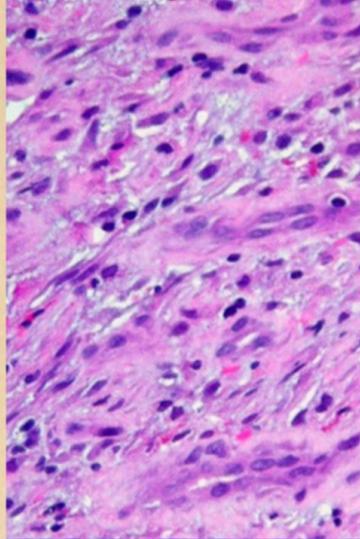
2
Monocyte - macrophages
*Separate eschar.
 Recruit repair cells.*



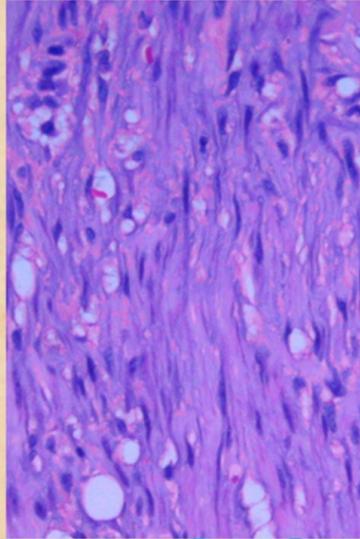
3
Aminoglycan ground substance
Environment for repair cells to create new structure.



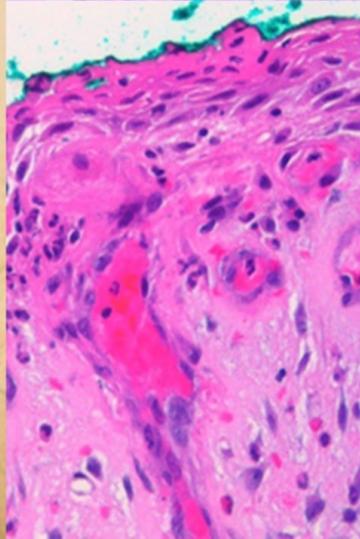
4
Angiogenesis
New blood vessels in the AG layer.



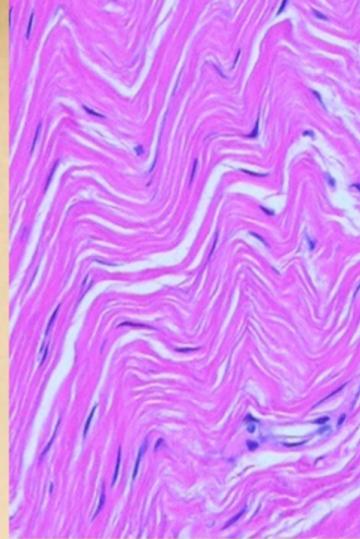
5
Fibroplasia
Connective protein tissue matrix.



6
Contraction
Reduction of wound surface.



7
Epithelial migration
Outgrowth onto the other proliferative elements.



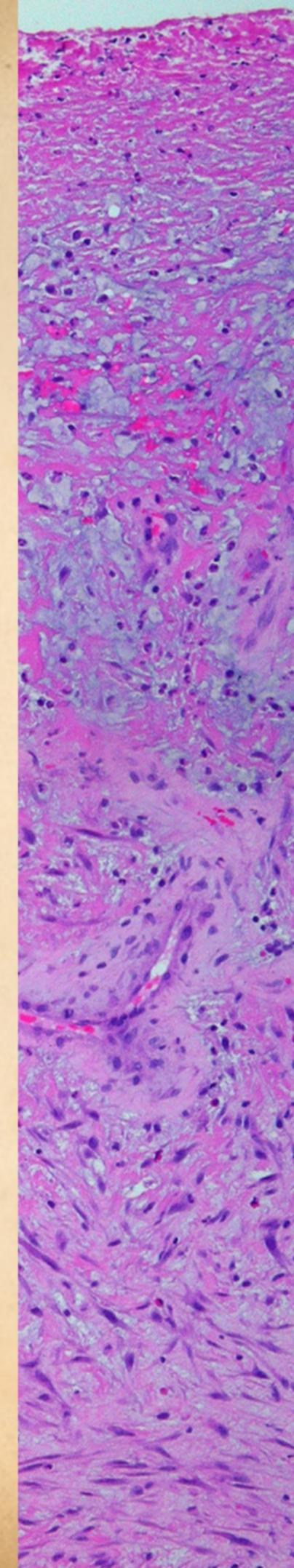
8
Maturation
Scar remodeling back to normal dermis or fascia.

WOUND BIOLOGY

1

← ● →

Normal Wound Physiology



Plasma Acute infl
 Angio - attraction
 Gag - vertical migration
 Angio - organization
 Connectives

acute inflammation

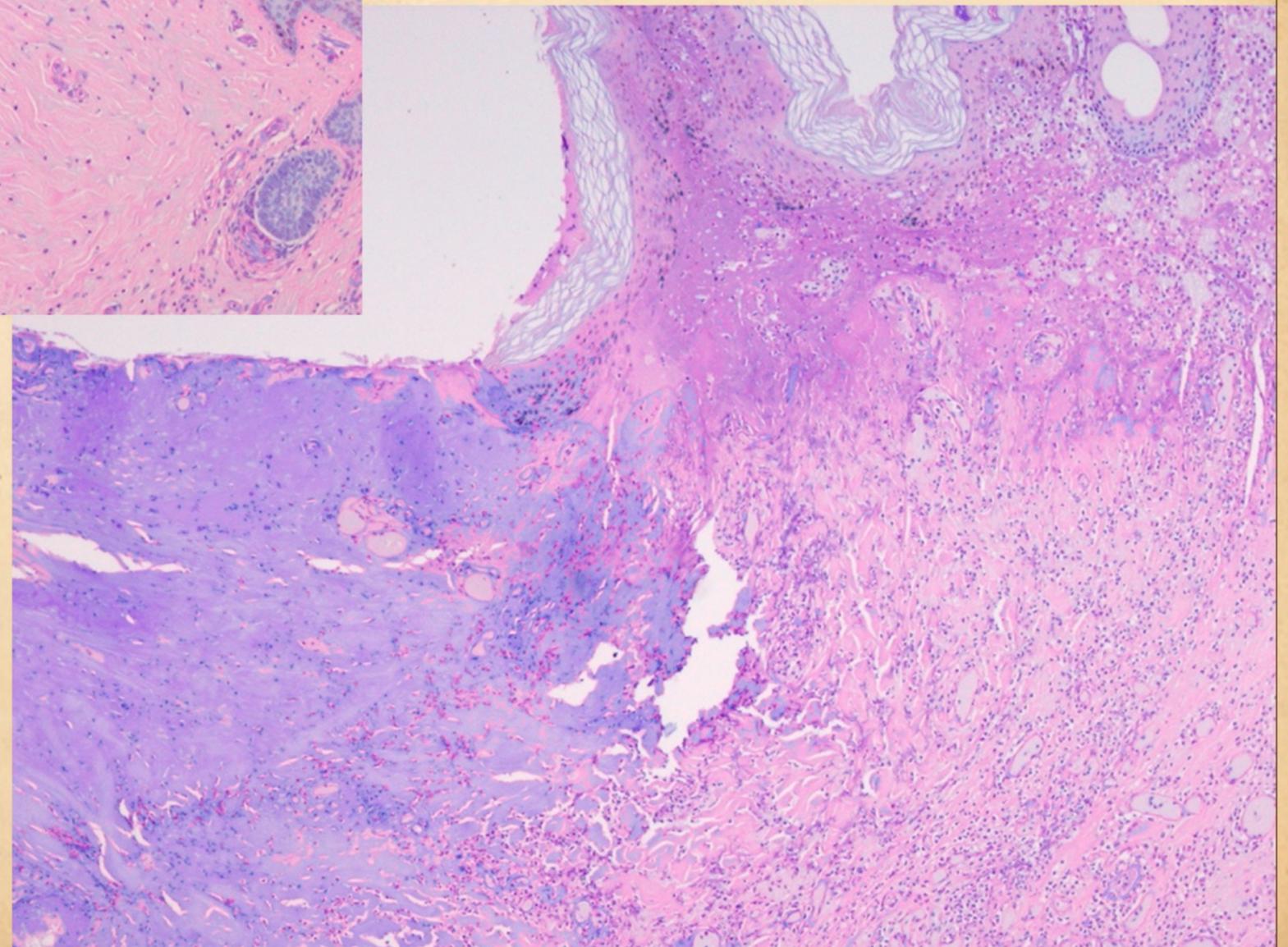
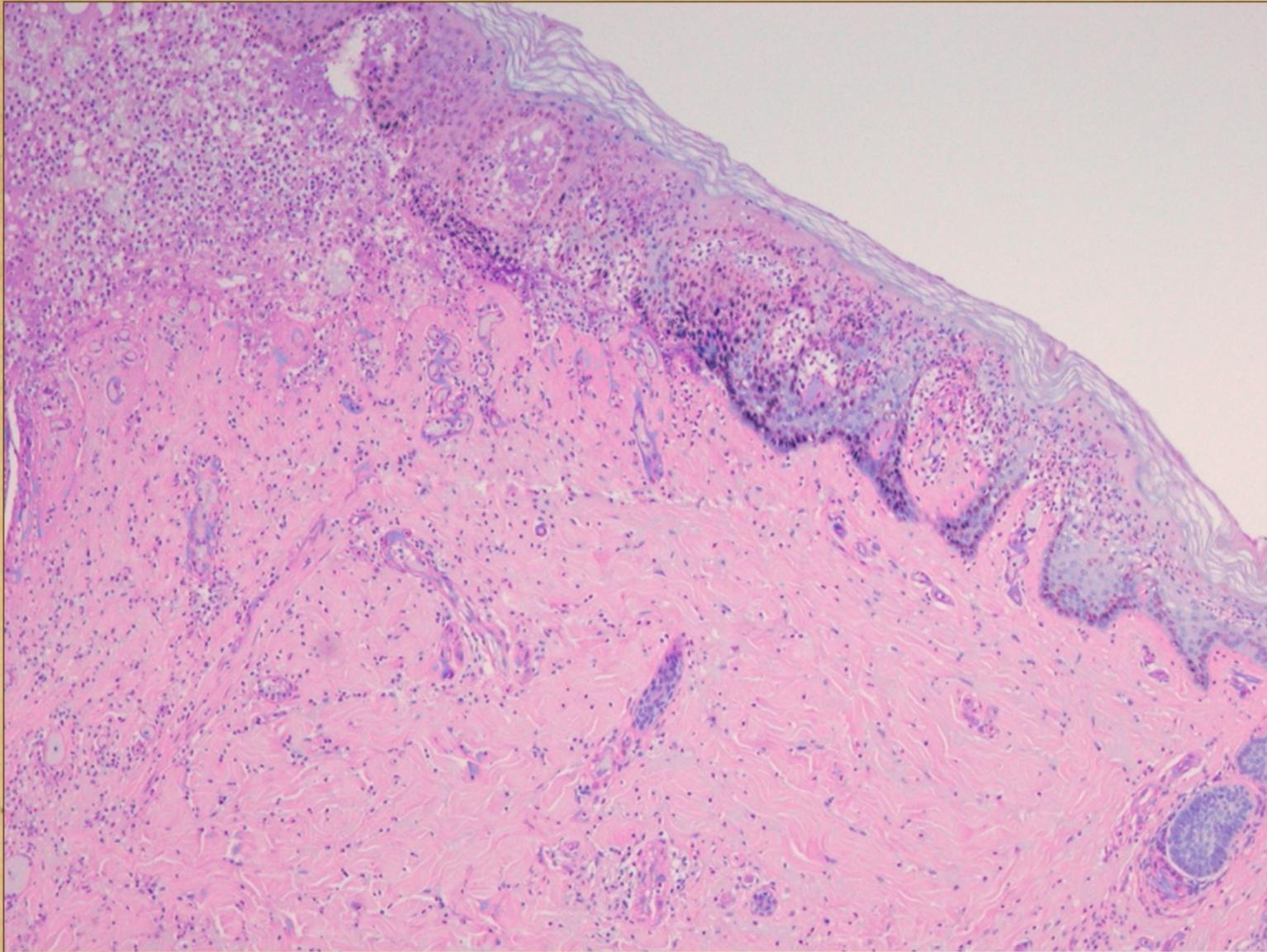
angiogenesis & granulation tissue

fibrogenesis & scar

TIME - DAYS

0

7

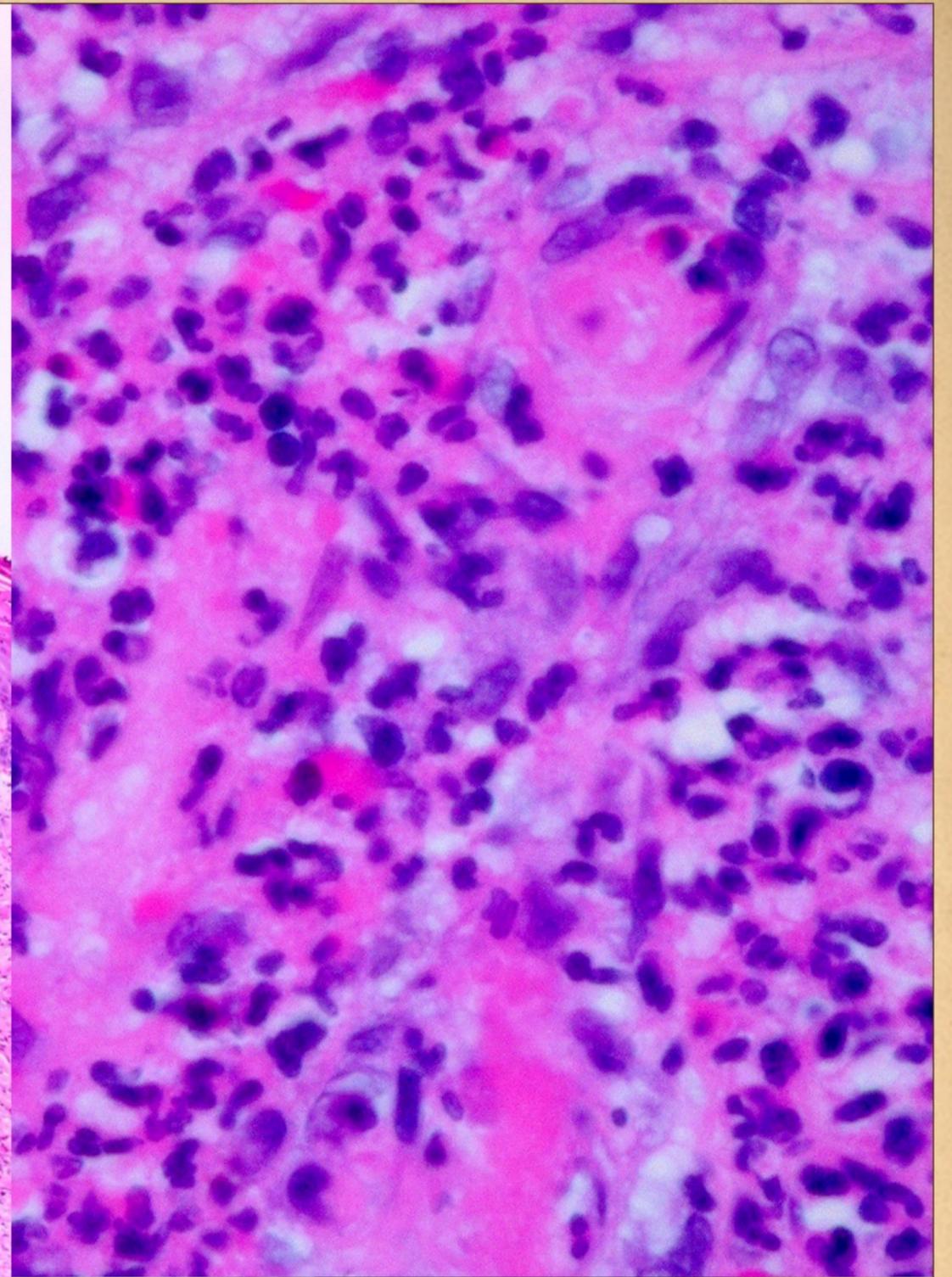
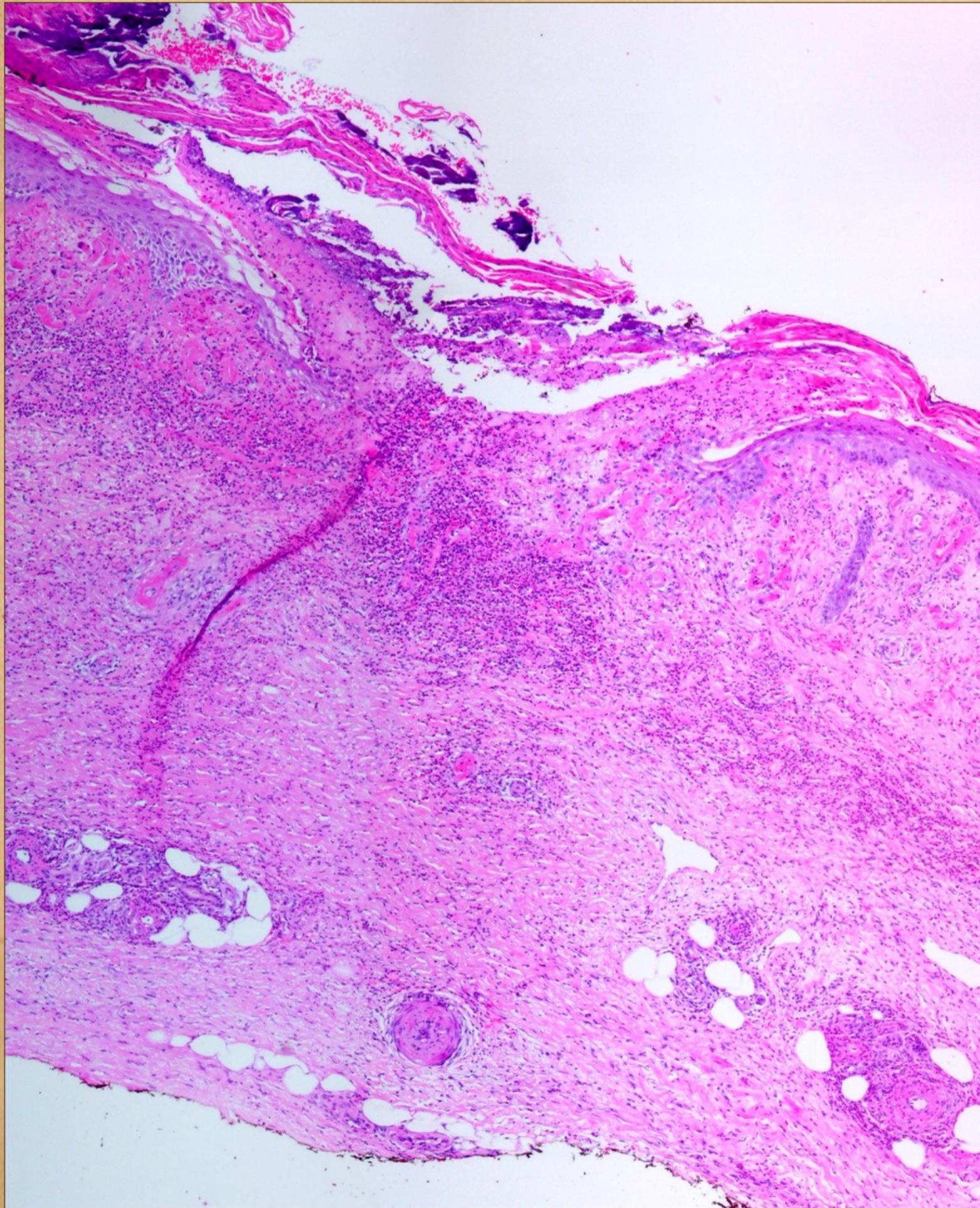


WOUND BIOLOGY

2

Effects of

injury, inflammation, infarction



85 f, *polyarteritis nodosa*

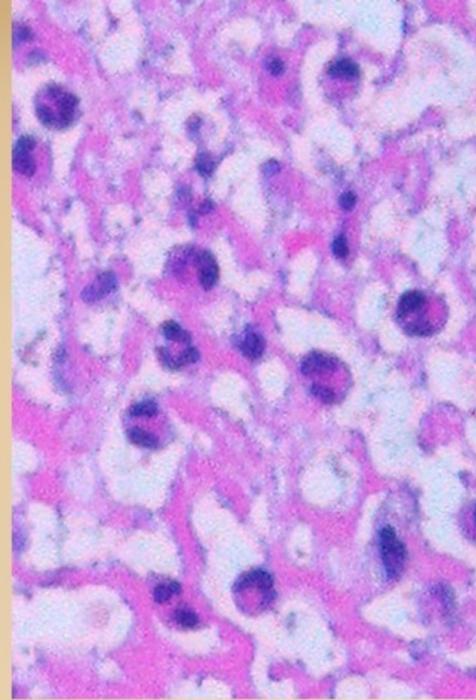
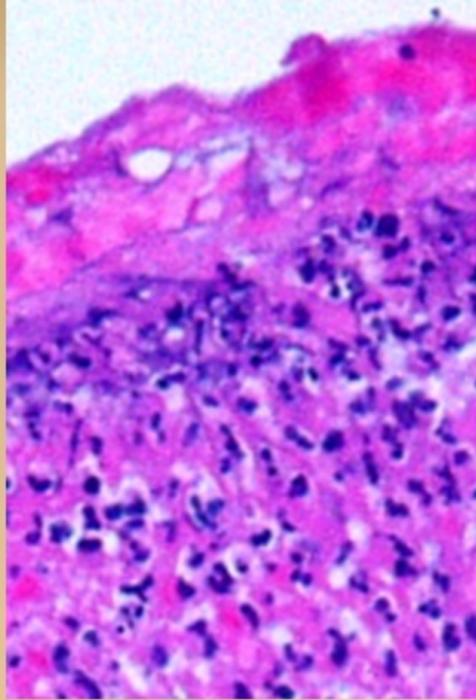
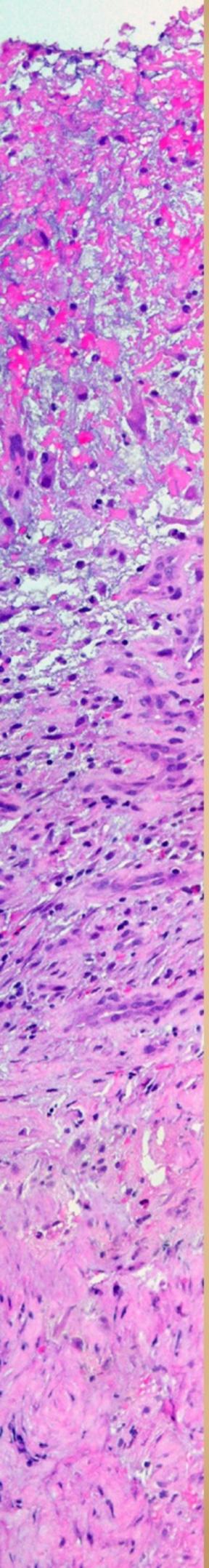


WOUND BIOLOGY

2



Effects
of
Subsiding
the
Acute
Status

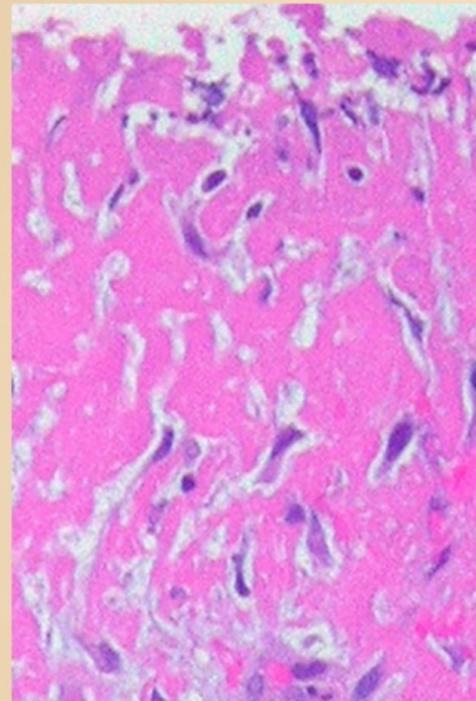
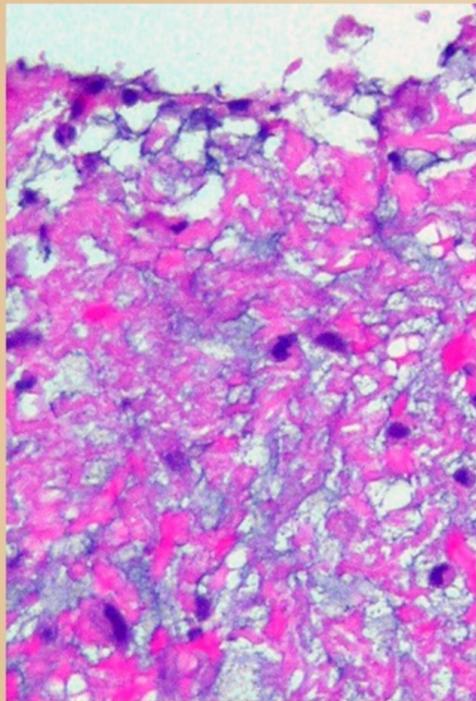


0 - Active injury & inflammation

The response to injury, the trigger for repair. Inflammation and repair are integrated sequential processes.

a, b – Wound surface with neutrophils and plasma exudates.

c – An injured leg, inflamed, not healing.

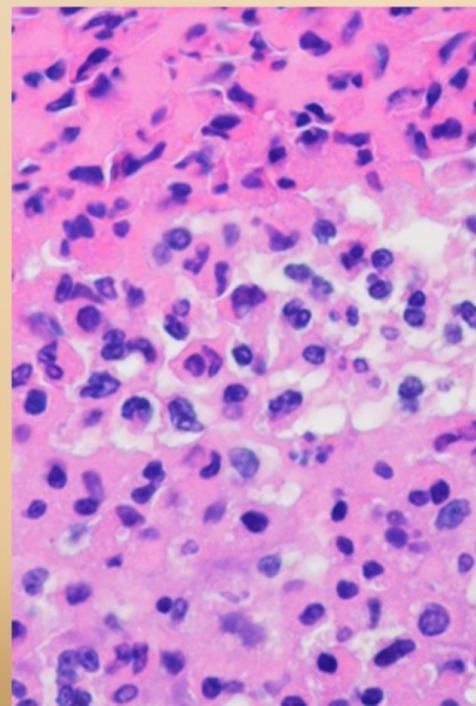
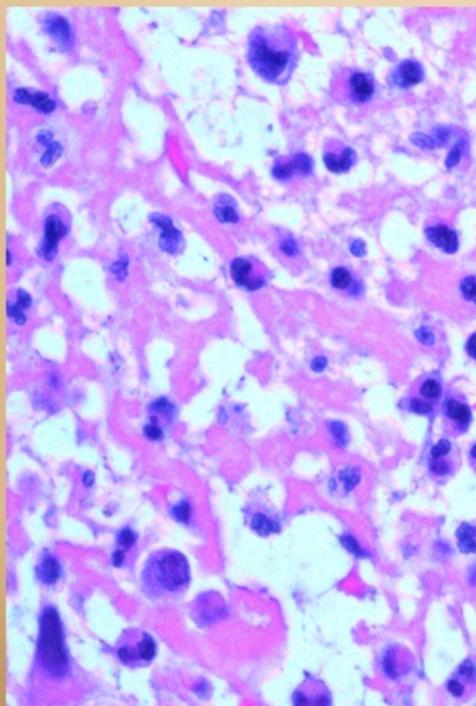


1 - Inflammation subsides

Sustained inflammation suppresses repair. It must subside for repair to proceed.

a, b – Wound surfaces well cared for, free of neutrophils and excess plasma exudates.

c – The same clinical case after 2 weeks of care, now healing.



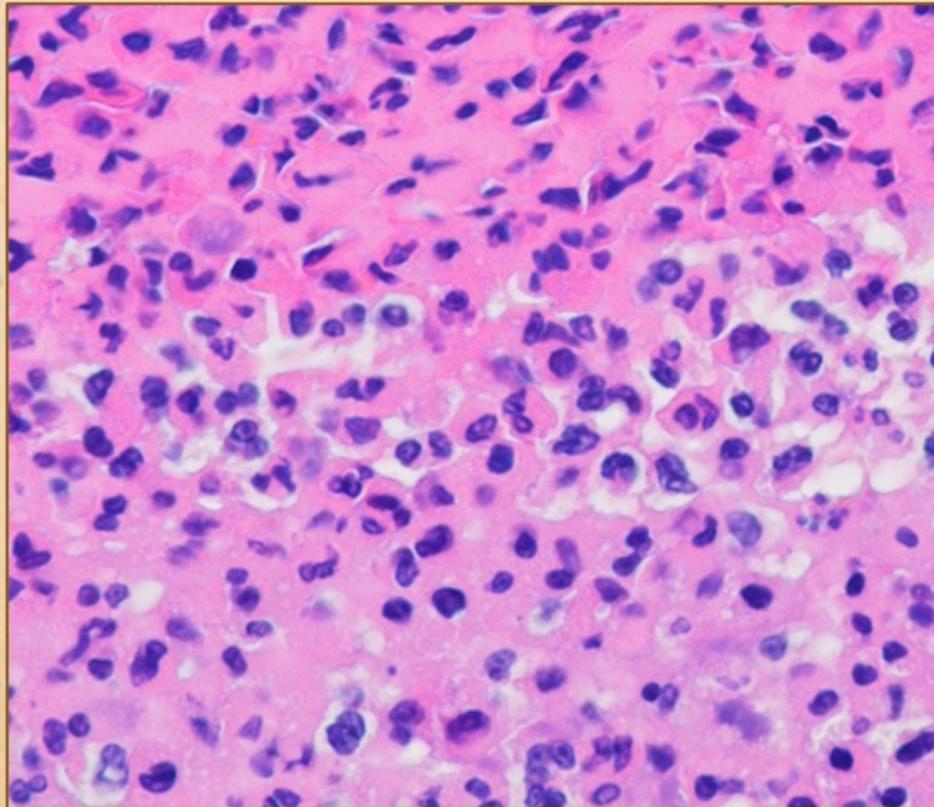
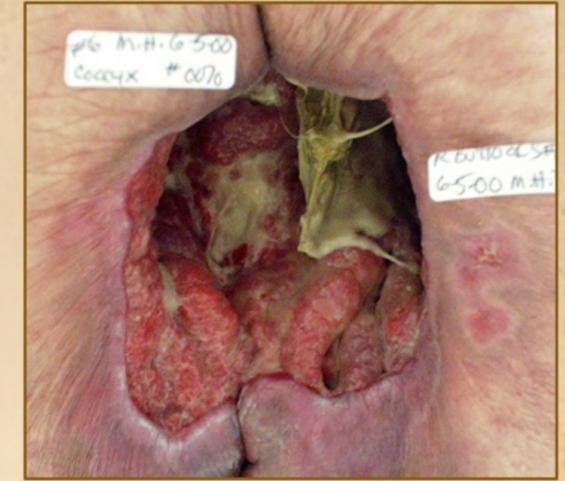
2 - Macrophages, eschar separation

Macrophages are monocytes transformed by inflammation; have multiple functions.

a – Enlarging mononuclear cells in the inflammatory layer.

b – Afferent function is eschar separation, the cleavage line.

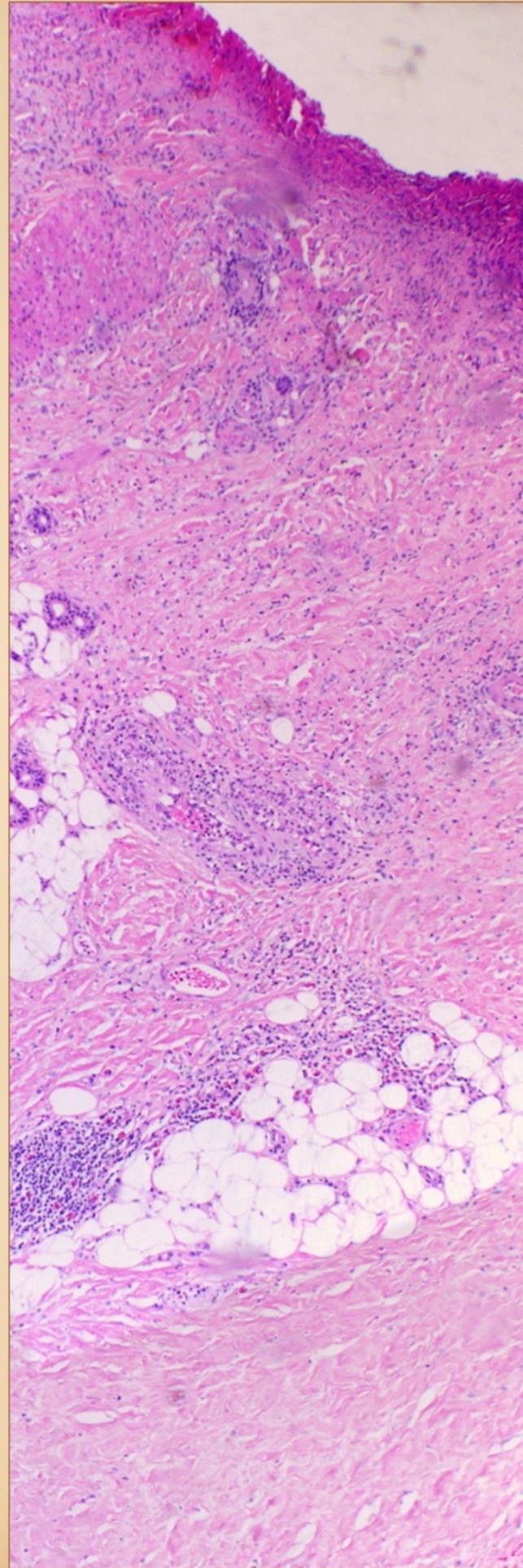
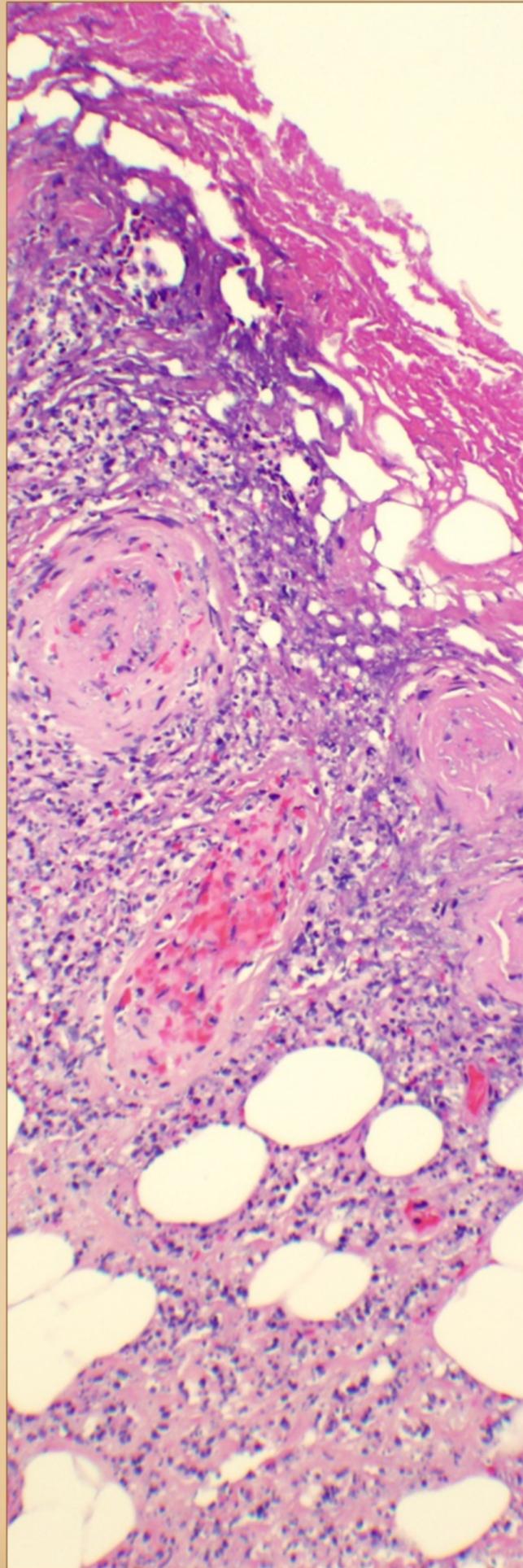
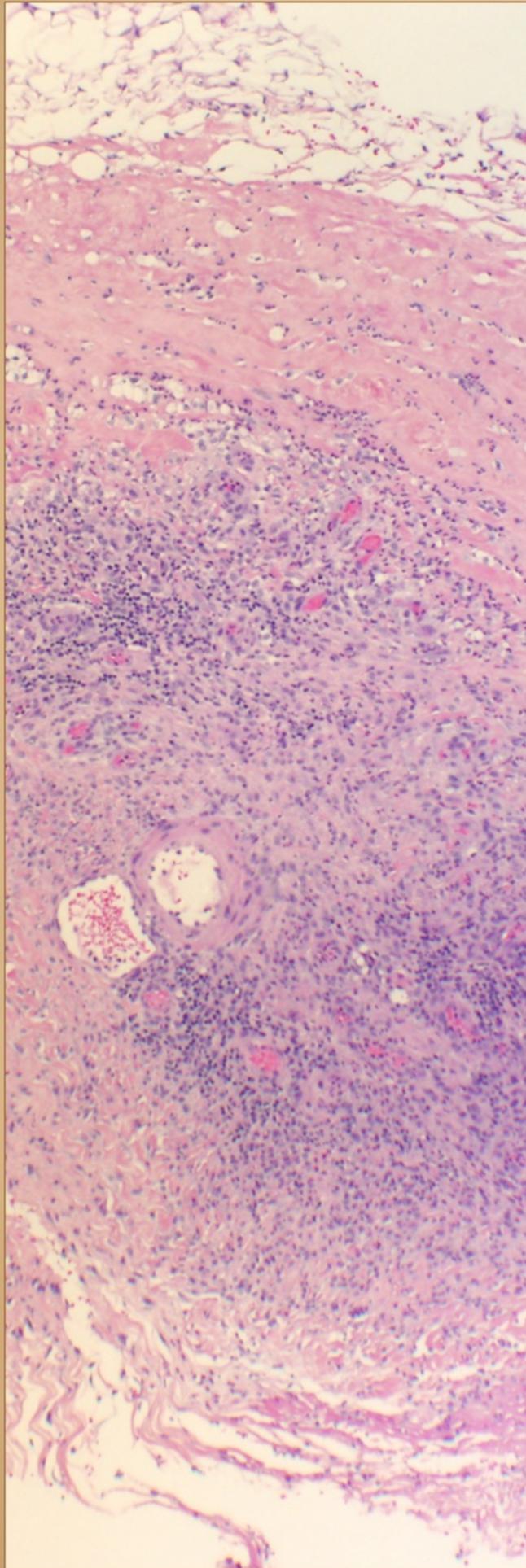
c – Eschar separation seen clinically.



WOUND BIOLOGY

3

Natural Eschar Separation



65 f, scleroderma-lupus, chronic leg ulcer with progression erosion

DEBRIDEMENT

WHY DO PROCEDURAL
DEBRIDEMENTS IN LIEU
OF ALLOWING NATURE
TO SEPARATE ESCHAR ?

**Debridement is Axiomatic
in the Care of Wounds**

*It separates disease
from the patient.*

◆ 1 ◆

In conditions of acute or active injury-
inflammation-necrosis-ulceration,
**debridement arrests
or eliminates disease,**
subsiding the process and
allowing the wound to enter its
efferent proliferative (healing) phase.

◆ 2 ◆

In conditions of a controlled but
chronic, impaired, delayed,
or persistent wound,
**maintenance debridement
improves healing,**
facilitating care,
improving wound kinetics,
and reducing time to full closure.



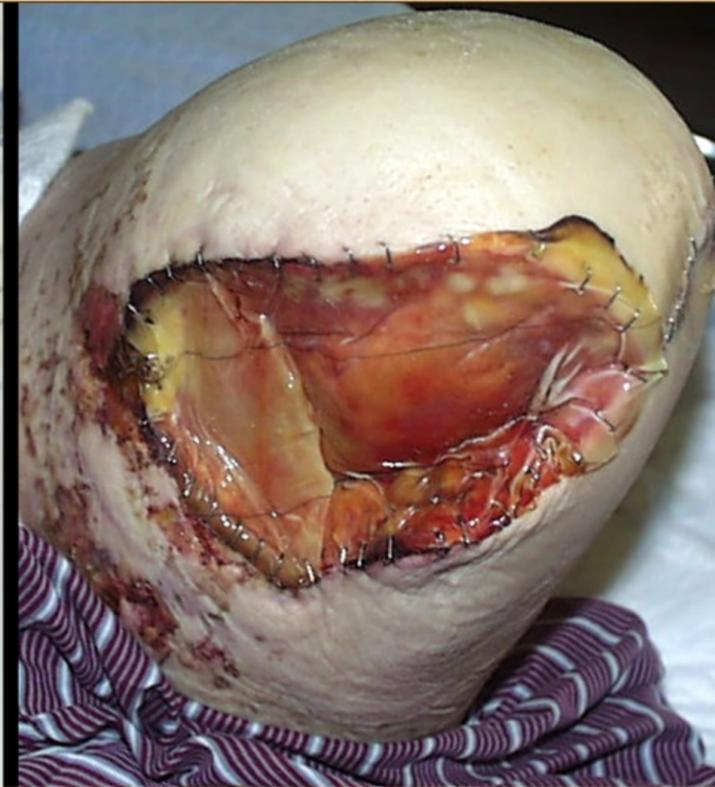


49 m, back trauma, arthrosis, abscess

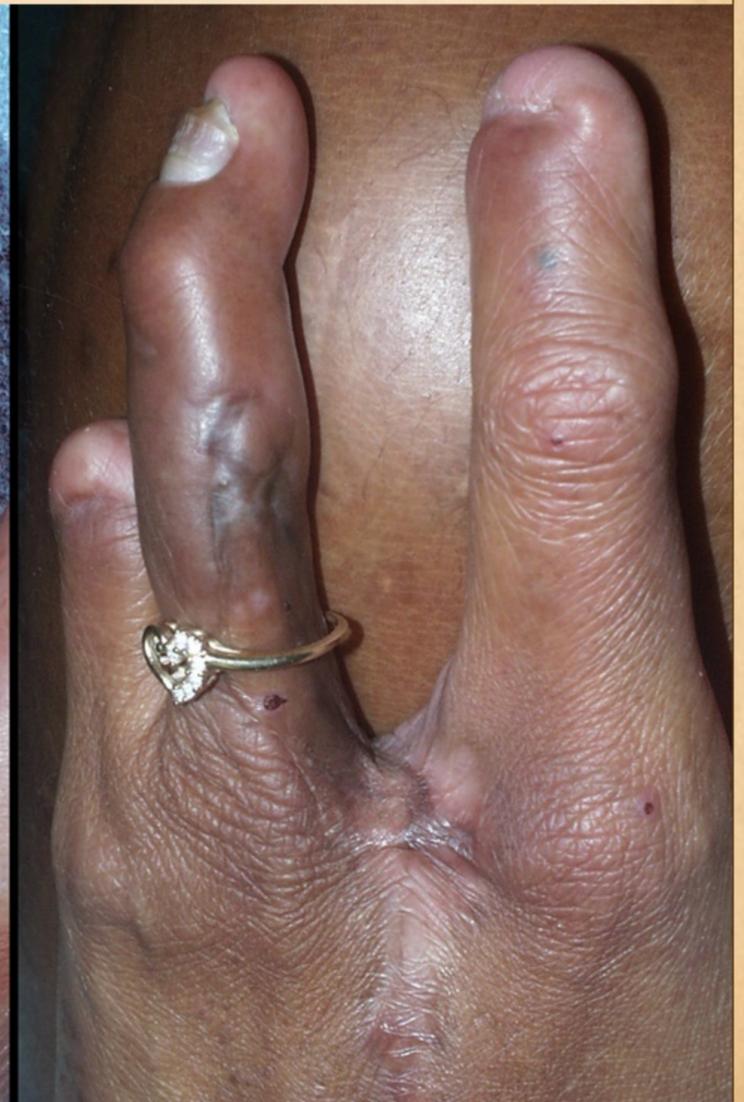


50 f, leg trauma, failed flap

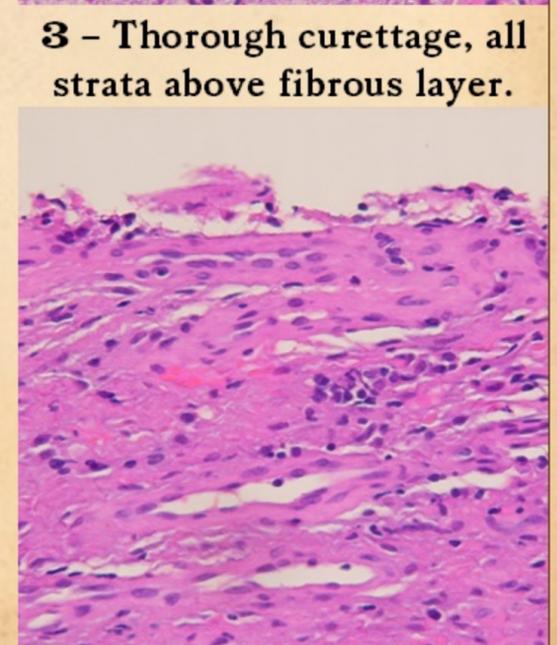
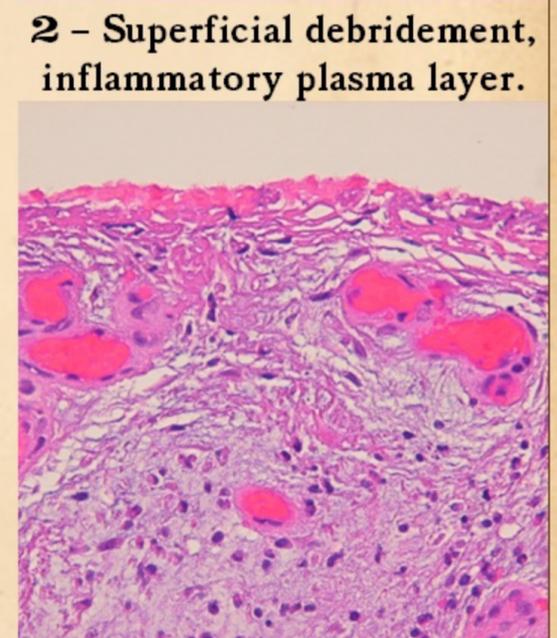
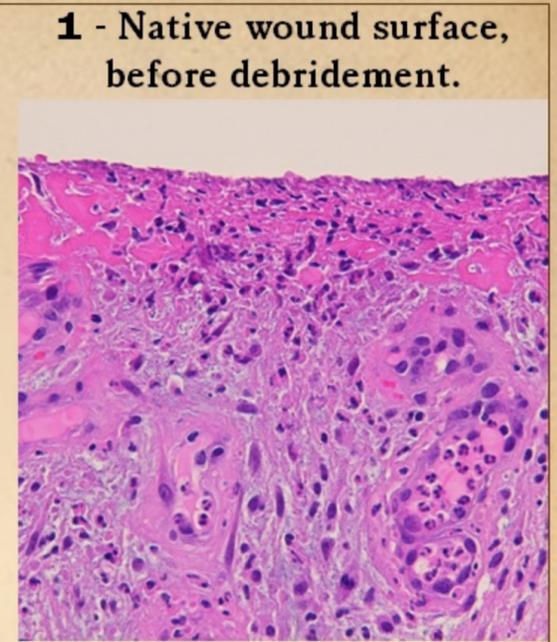
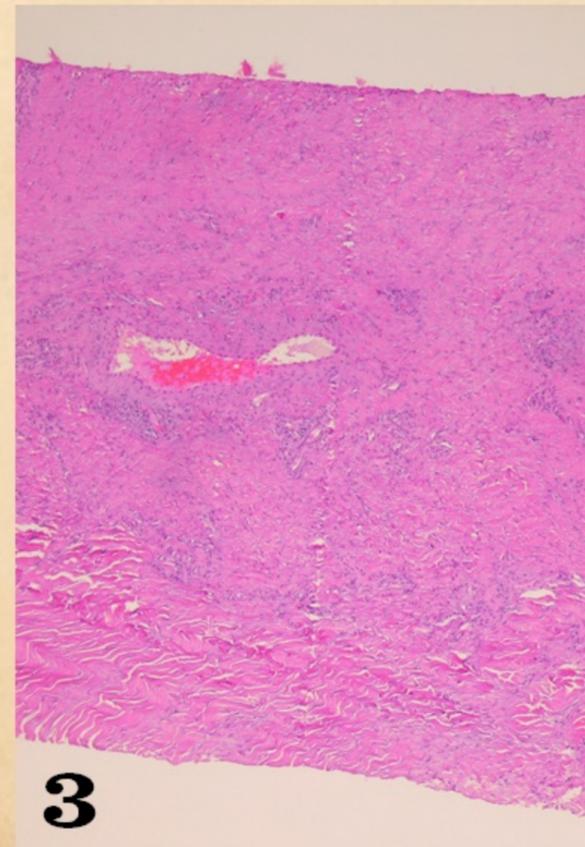
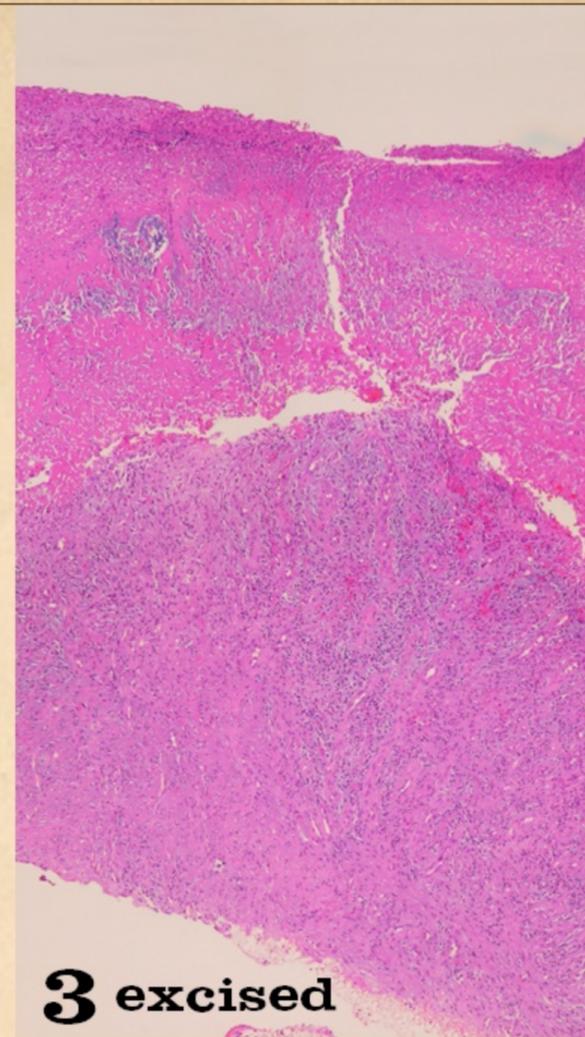
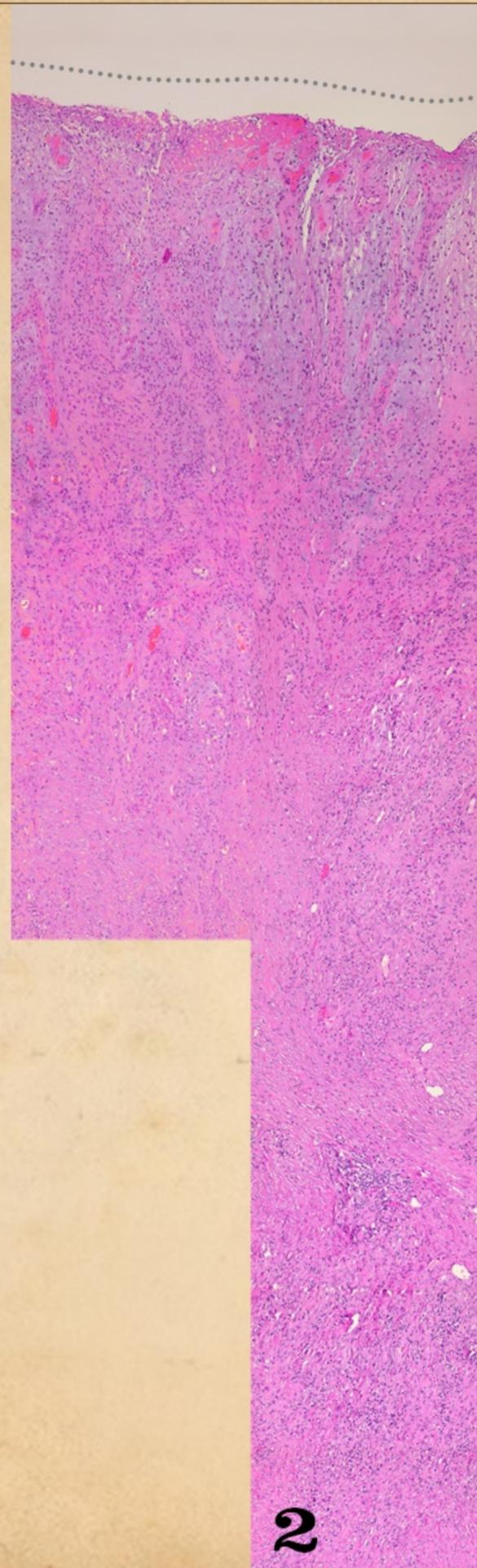
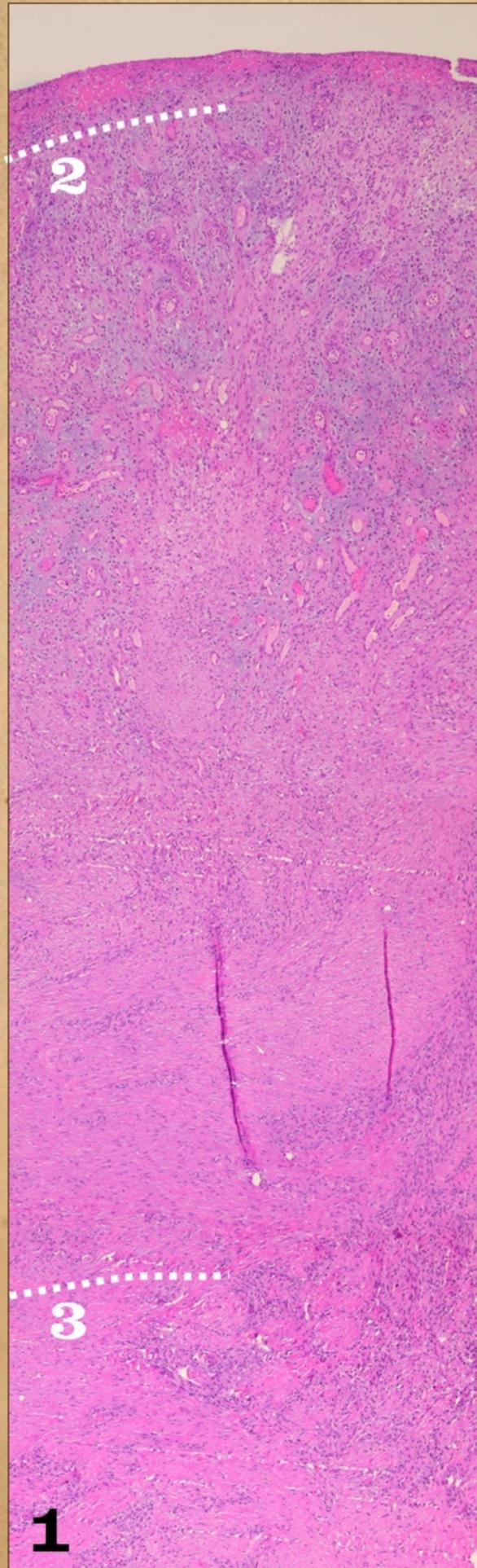
64 m,
aorto-iliac aso-pvod



42 f,
dm, aso-pvod hands



Debridement layers





TECHNICALITIES

PRIME PRINCIPLE

Remove the bad.

Leave the good.

RECOGNIZING GOOD & BAD

Understanding depth of the injury & necrosis.

Visual appearance vs nature of disease & anatomy.

Unmasking necrosis and not recognizing it.

*Architectural integrity of protected infarcts,
- versus - necrobiosis of exposed infarcts.*

Wide latitude for too much & too little.

Too little - sequential debride can be done.

Too much - no consequence to closure.

(But avoid unintended injury.)

PRACTICES

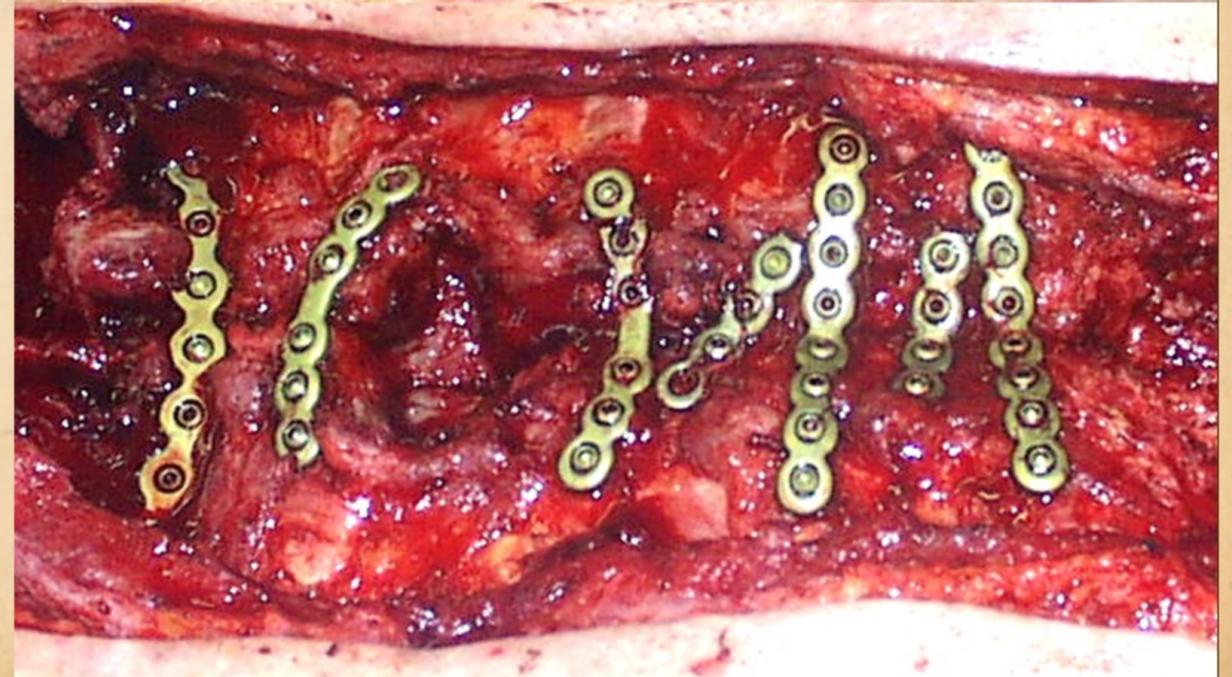
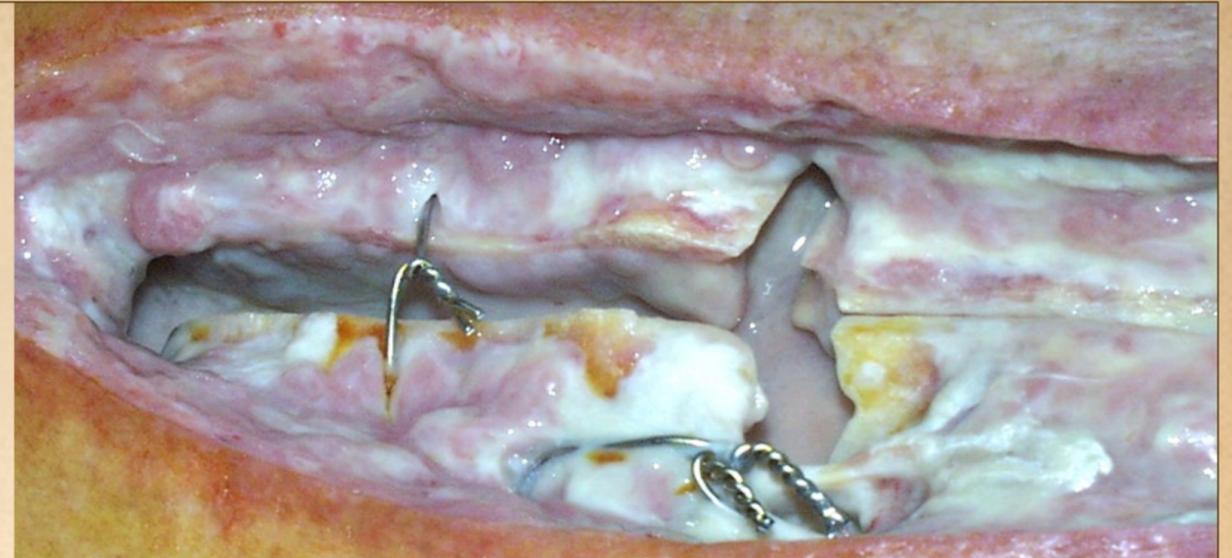
Office, clinic, bedside, operating room.

Surgeons and non-surgeons.

Only a minimum of tools required.

*Supplemental supplies
(sutures, hemostatics, dressings).*

82 f, trauma, avulsion-hematoma



67 f, rheumatoid-steroids, surgery dehiscence

73 m, sternal dehiscence after coronary bypass



CATEGORICAL DEBRIDEMENT
(formal excision of eschar)

—◆ VERSUS ◆—

MAINTENANCE DEBRIDEMENT
(surface curettage)

Drainage of abscess and excision of necrotic & necrobiotic tissue are mandatory for care.

Debridement of this sort is axiomatic in the principles of wound care and surgery.

Wound maintenance by periodic curettage and removal of the superficial wound strata is generally considered a worthy activity.

What is the evidence for wound maintenance activities?

Debridement use & abuse.

Morality & legality in wound practice.



58 m, arterial injection injury, hand

71 m, rheumatoid ankle ulcer

61 f, mctd-autoimmune ankle ulcer

DEBRIDEMENT & Integrated Care

WOUND MANAGEMENT - PRIME SCHEMA

PHASE 1: MANDATORY Rx - Wound Control

Control disease and turn the wound healthy, non-threatening, asymptomatic.

INITIAL DEBRIDEMENT TO CONTROL THE WOUND.

PHASE 2: DISCRETIONARY Rx - Definitive Care

Implement treatment goals for closure, palliation, or other specific resolution.

PERIODIC DEBRIDEMENT TO IMPROVE WOUND,
OR FINAL DEBRIDEMENT AT WOUND CLOSURE.

PHASE 3: FOLLOW-UP Rx - Maintenance Care

Manage disease to prevent flare-up & ulcer recurrence, or maintain deliberate open wounds.

MAINTENANCE DEBRIDEMENT FOR LONG CONTROL.

WOUND HYGIENE

Debridement is one concept from the broad domain of wound hygiene, a set of modalities that ensures the safety and stability of wound and patient throughout the entire wound cycle.



Zodiac Man, 1702 reproduction of earlier work.



DEBRIDEMENT



An axiomatic and quintessential
modality of wound care
for effective results
and patient safety.

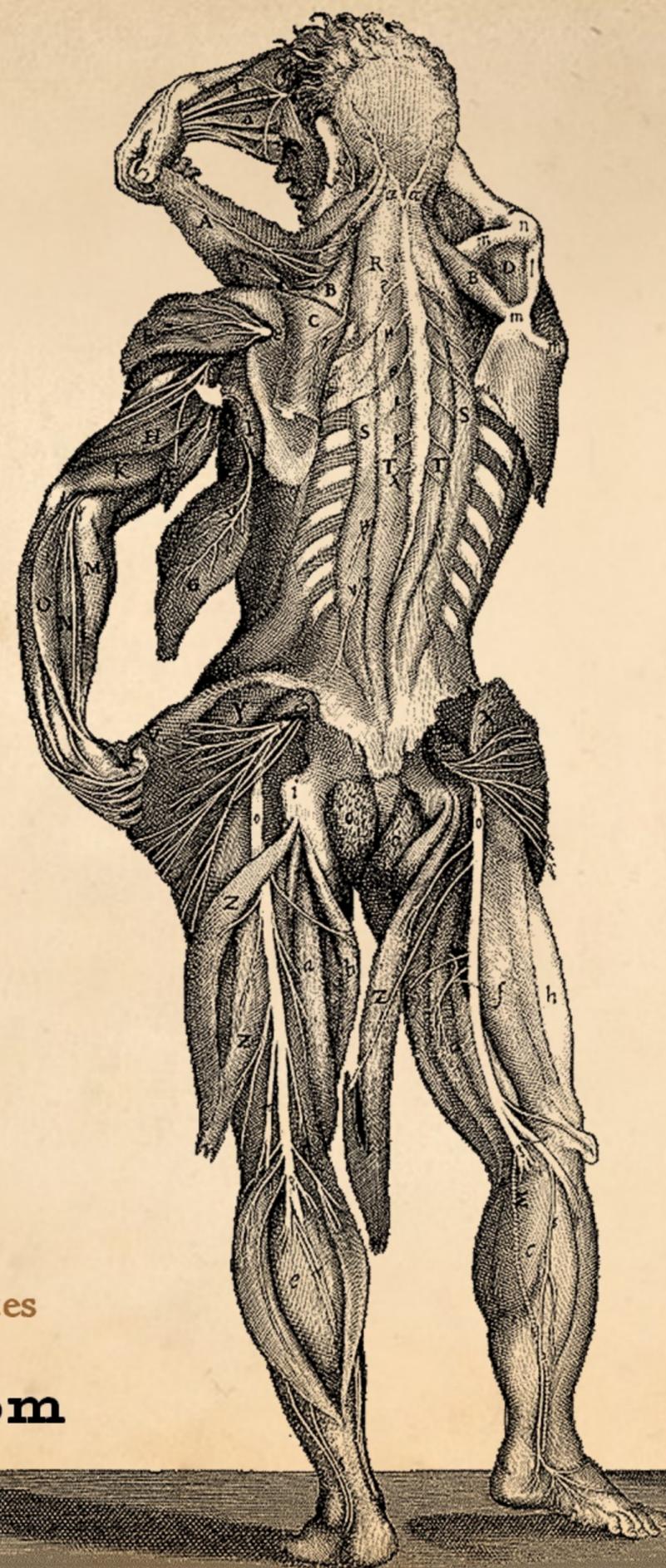
**Remove the bad.
Leave the good.**

Drain and debride to arrest or remove
inflammation, necrosis, active disease.

Marc E. Gottlieb, MD, FACS
Phoenix, Arizona

2016

Presentation and notes
are on the website.
arimedica.com



ספר הנחמה

