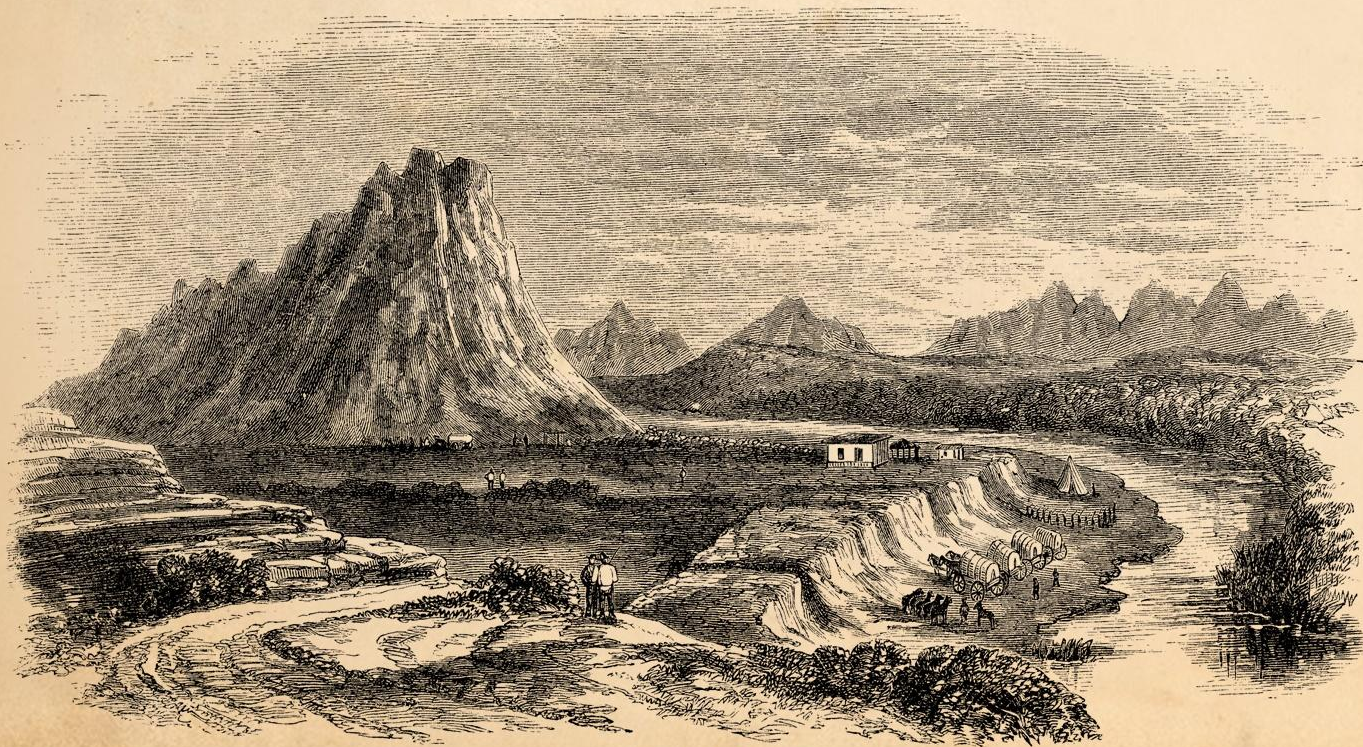


IN SITU TISSUE ENGINEERING WITH INTEGRA

CLINICAL OBSERVATIONS AND LESSONS FROM A DERMAL REGENERATION TEMPLATE

Marc E. Gottlieb, MD, FACS Phoenix, AZ

INGENIERÍA DE TEJIDOS IN SITU CON INTEGRA • Observaciones Clínicas y Lecciones a Partir de una Plantilla de Regeneración Dérmica



ANTELOPE PEAK.

Building something from bare landscape. —●— **Arizona Territory, 1869** —●— *Construir algo a partir de paisaje desnudo.*



University of Arizona



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**IN SITU
TISSUE ENGINEERING
- WITH -
REGENERATIVE
MATRICES**

**FOUR GENERAL
CATEGORIES OF USAGE**

CRITICAL COVERAGE
BIOLOGICAL SUPERDRESSING
ESSENTIAL COVERAGE
RECONSTRUCTION



**CRITICAL
COVERAGE**

Integra masks wound recognition and suppresses inflammation. Used during clinical illness or wound instability, Integra arrests adverse pathology & induces recovery.



**BIOLOGICAL
SUPERDRESSING**

Unlike ordinary biological dressings which have only a temporary role to induce wound stability, Integra survives that phase then has a 2nd function to regenerate a neodermis.

IN SITU TISSUE ENGINEERING - WITH - REGENERATIVE MATRICES

FOUR GENERAL CATEGORIES OF USAGE

CRITICAL COVERAGE

BIOLOGICAL SUPERDRESSING

ESSENTIAL COVERAGE

RECONSTRUCTION



ESSENTIAL COVERAGE

Refers to exposed anatomy in a wound that places life or limb at risk, or else cannot heal by natural contraction. Integra resolves both, acting as skin, then restoring it over such structures.

RECONSTRUCTION

Integra prevents inflammation and normal wound healing, and thus scar. For reconstructive surgery, it prevents and relieves contractures and preserves good qualities of skin.

PARADIGMS OF CONVENTIONAL WOUND CLOSURE & RECONSTRUCTION

All depend on normal post-inflammatory wound healing.



0 -
Topical
Care
&
Natural
Contraction



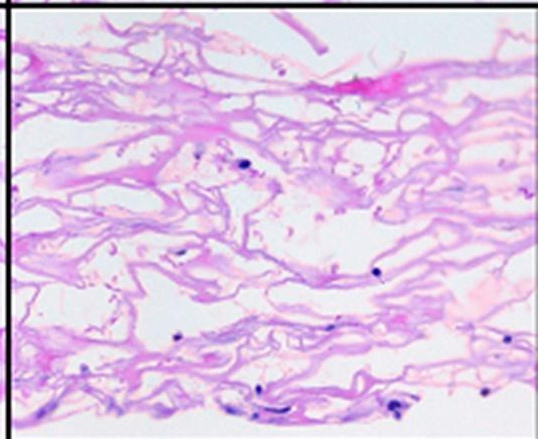
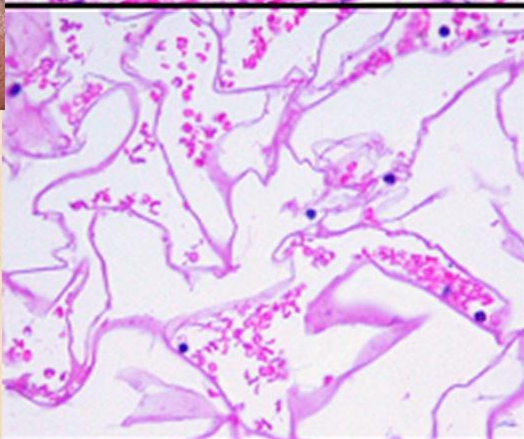
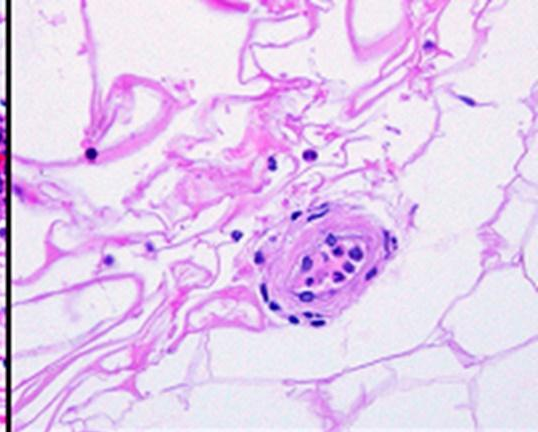
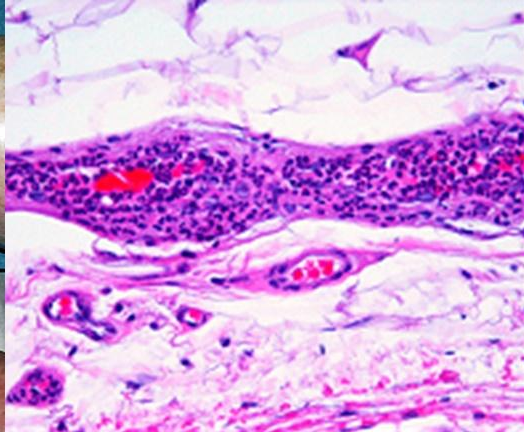
1 - Simple Repairs



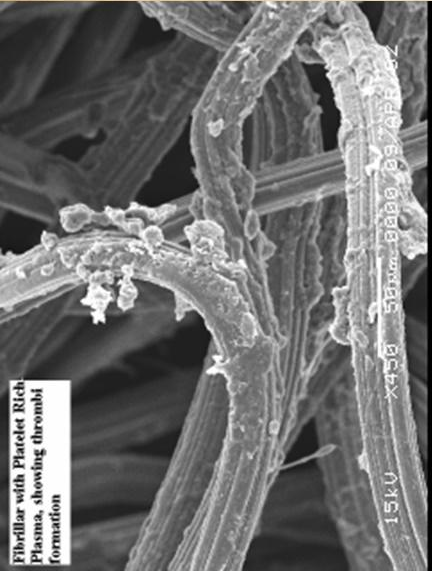
2 - Grafts



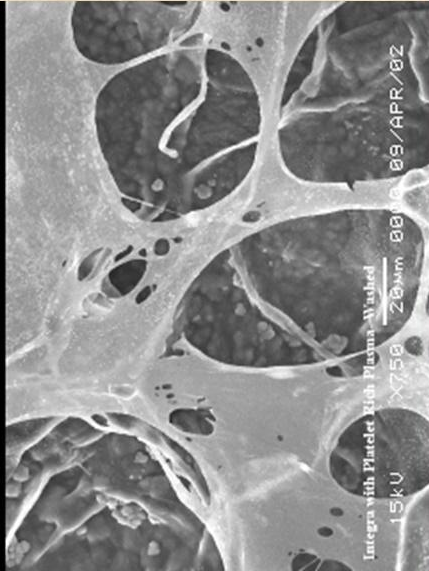
3 - Flaps



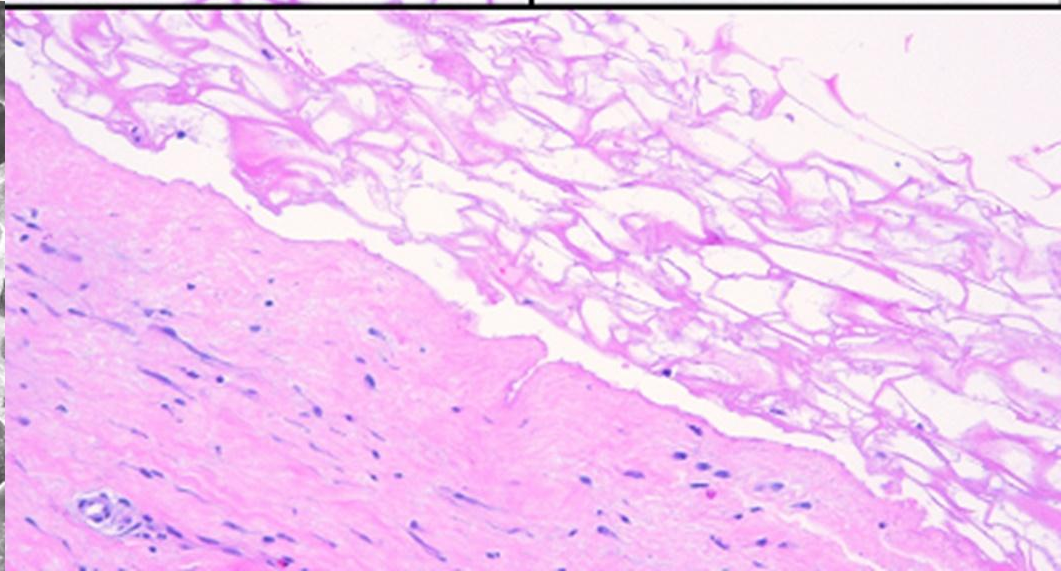
Arrest of inflammation



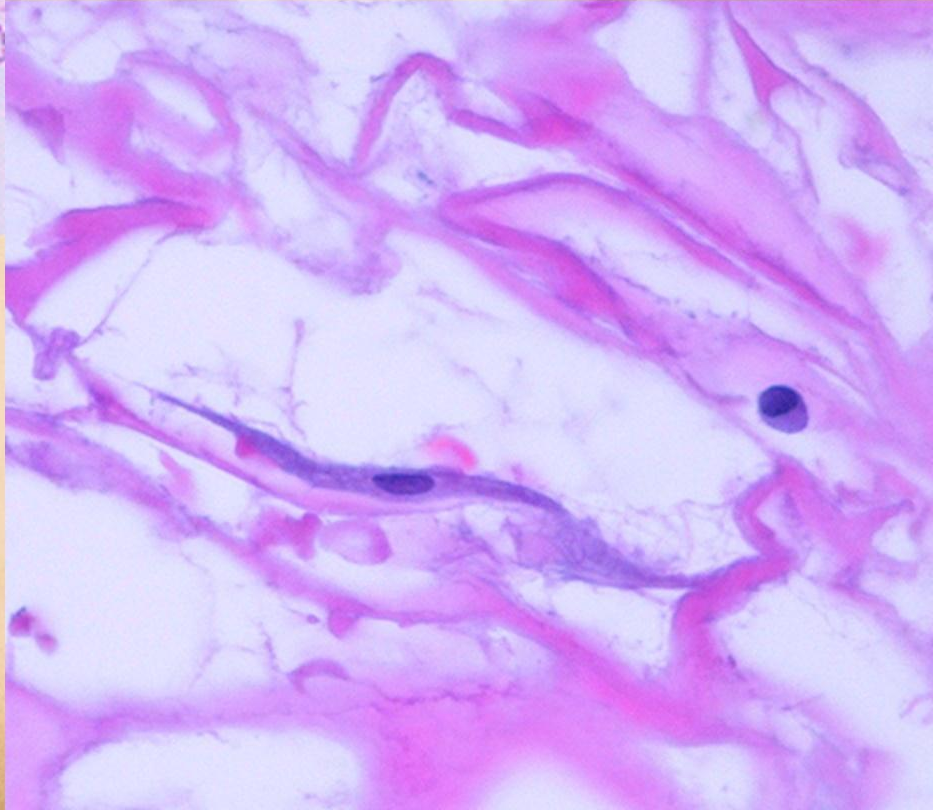
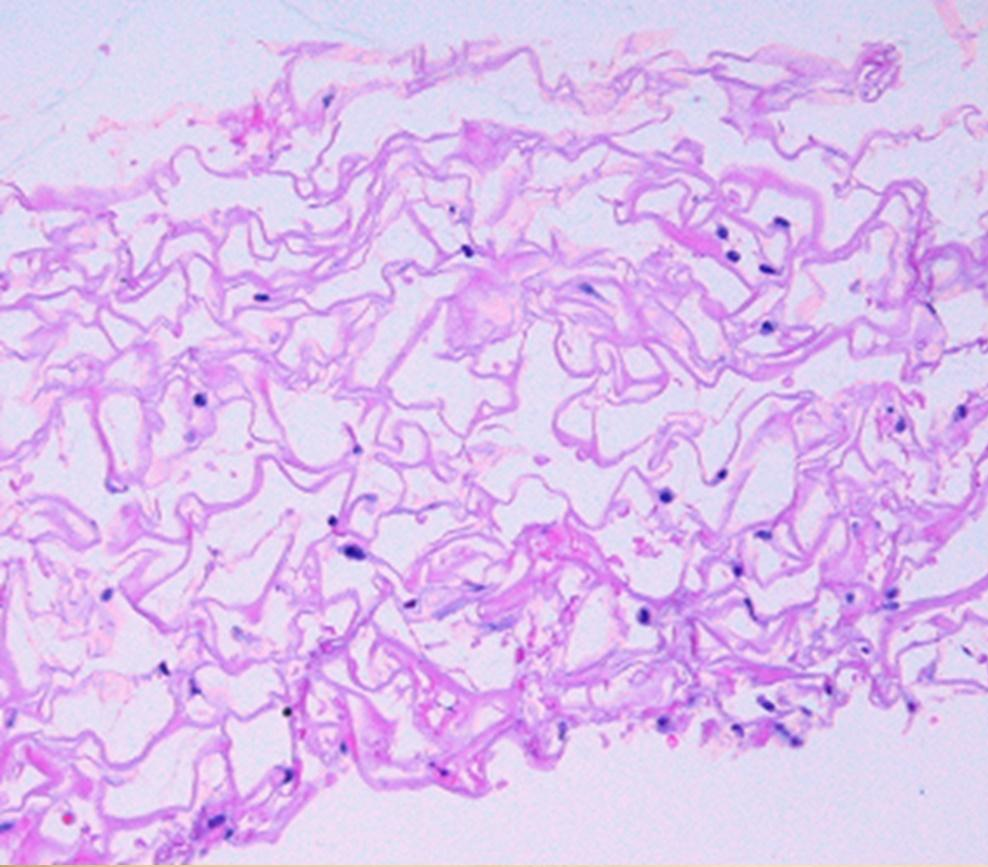
Fibrillar with Platelet Rich Plasma, showing thrombi formation



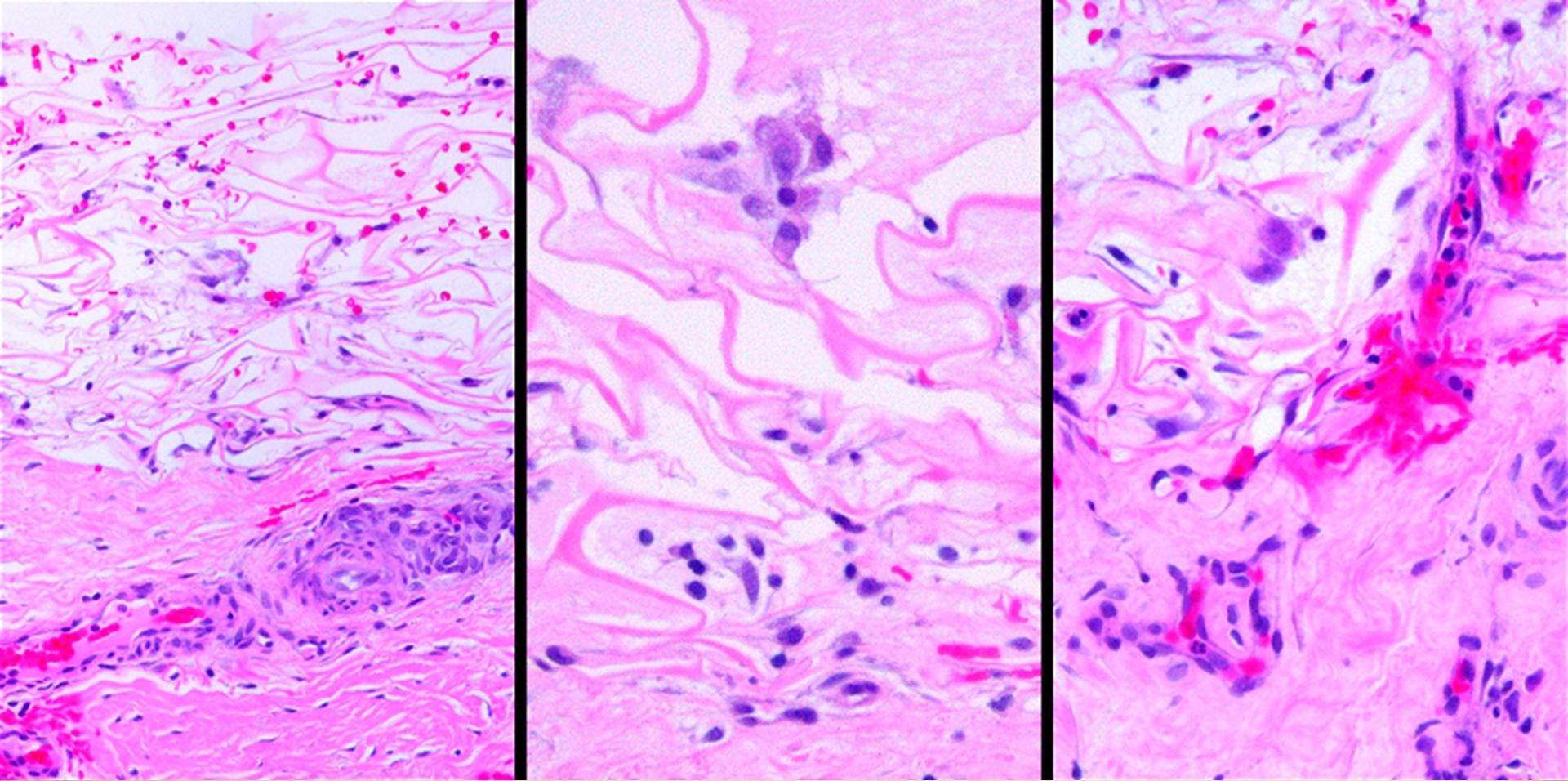
Integra with Platelet Rich Plasma, Washed



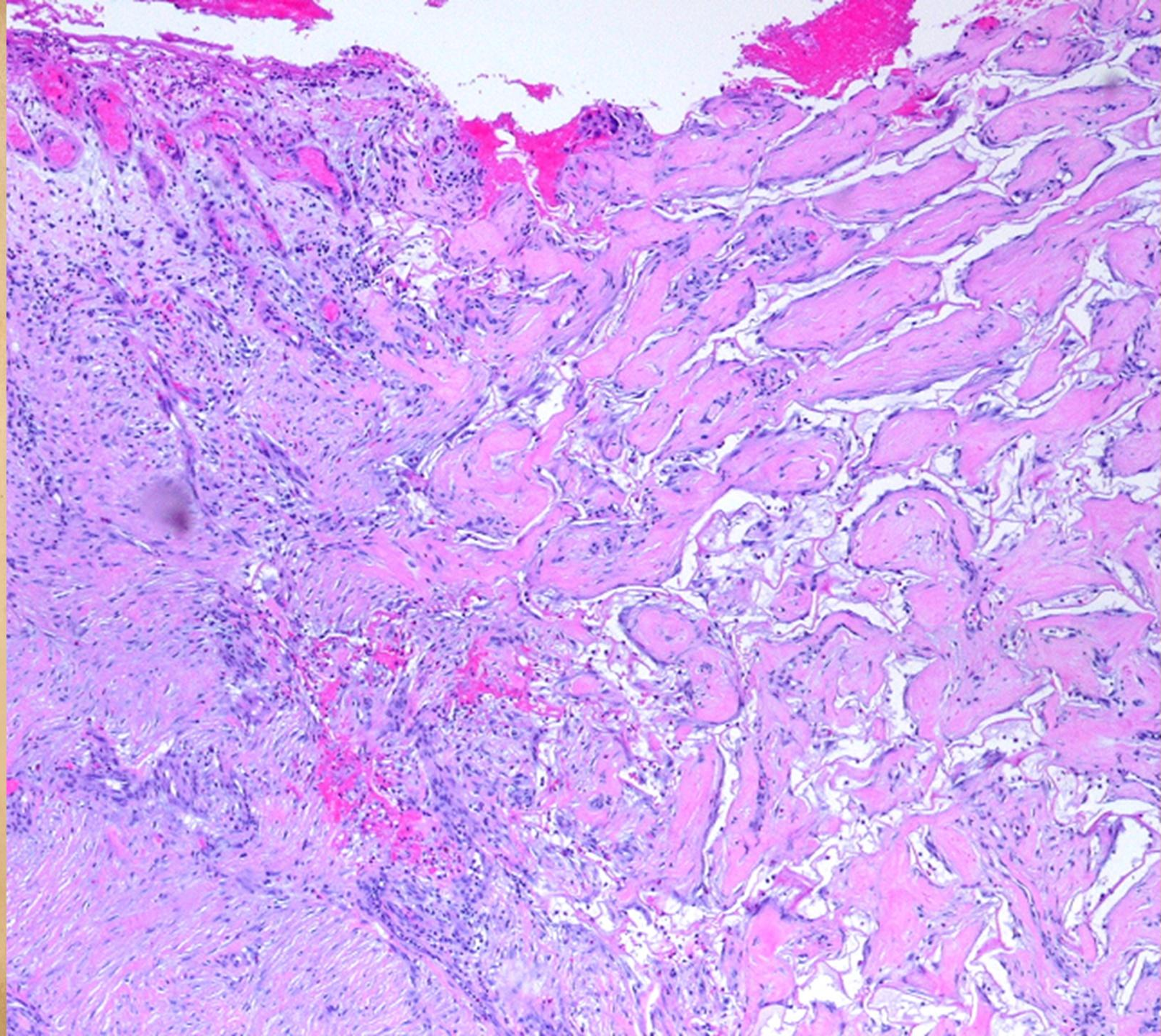
**Recognition of the matrix,
pioneer cells**

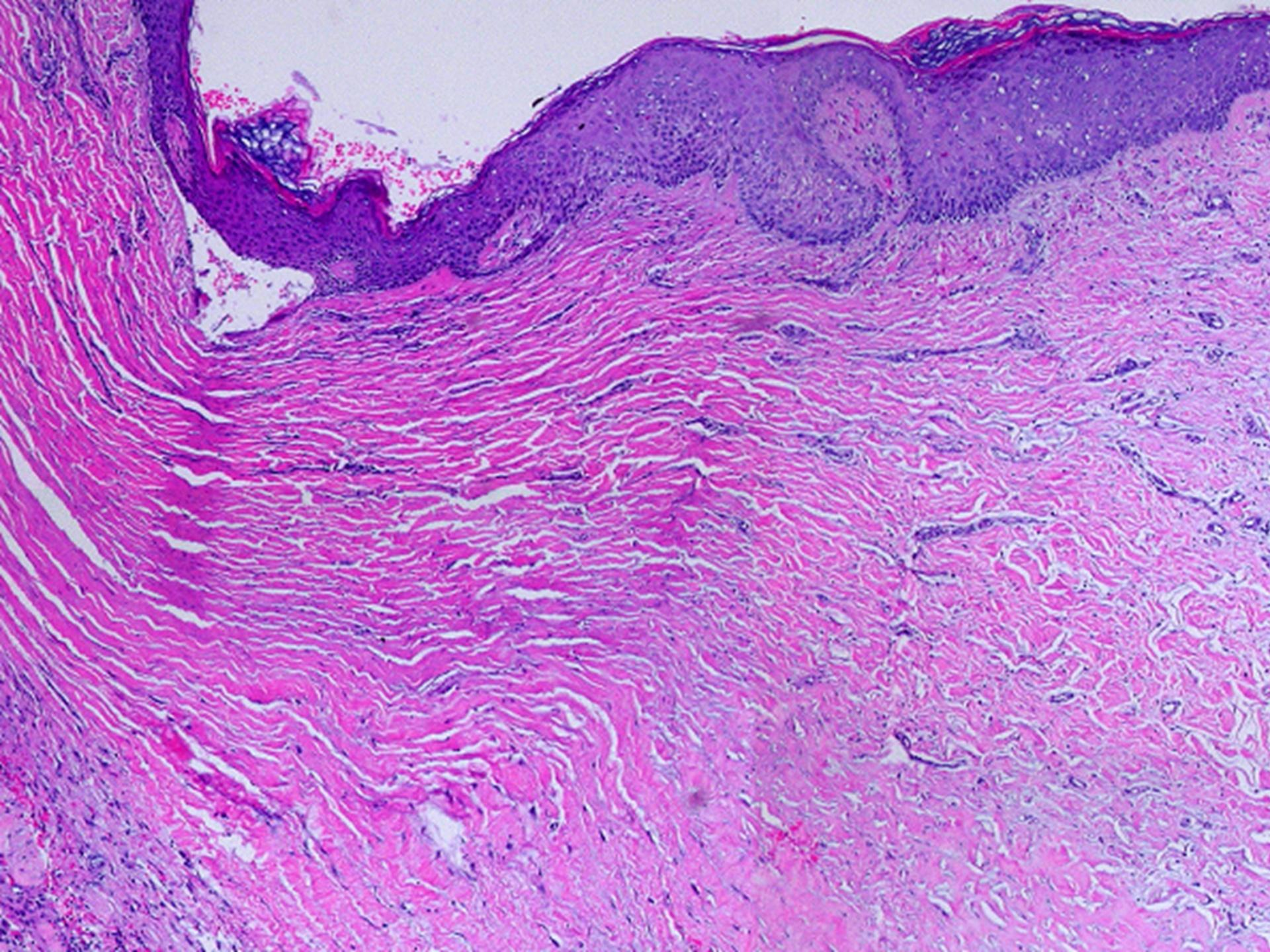


Transition



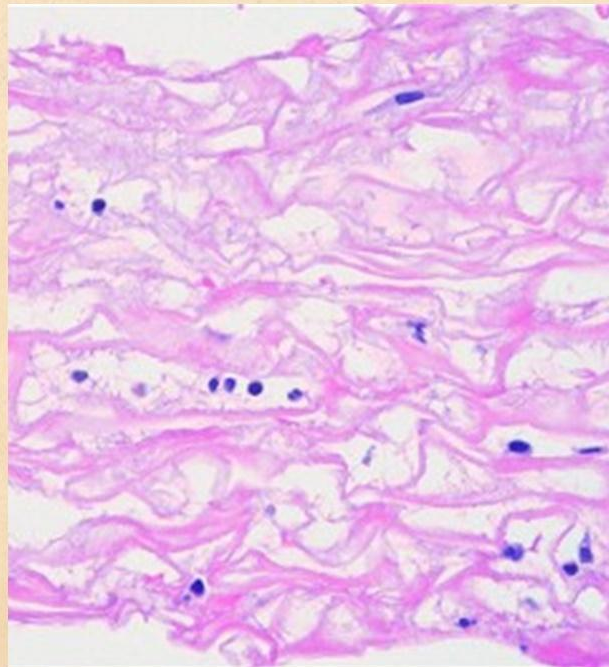
Syncytial transformation





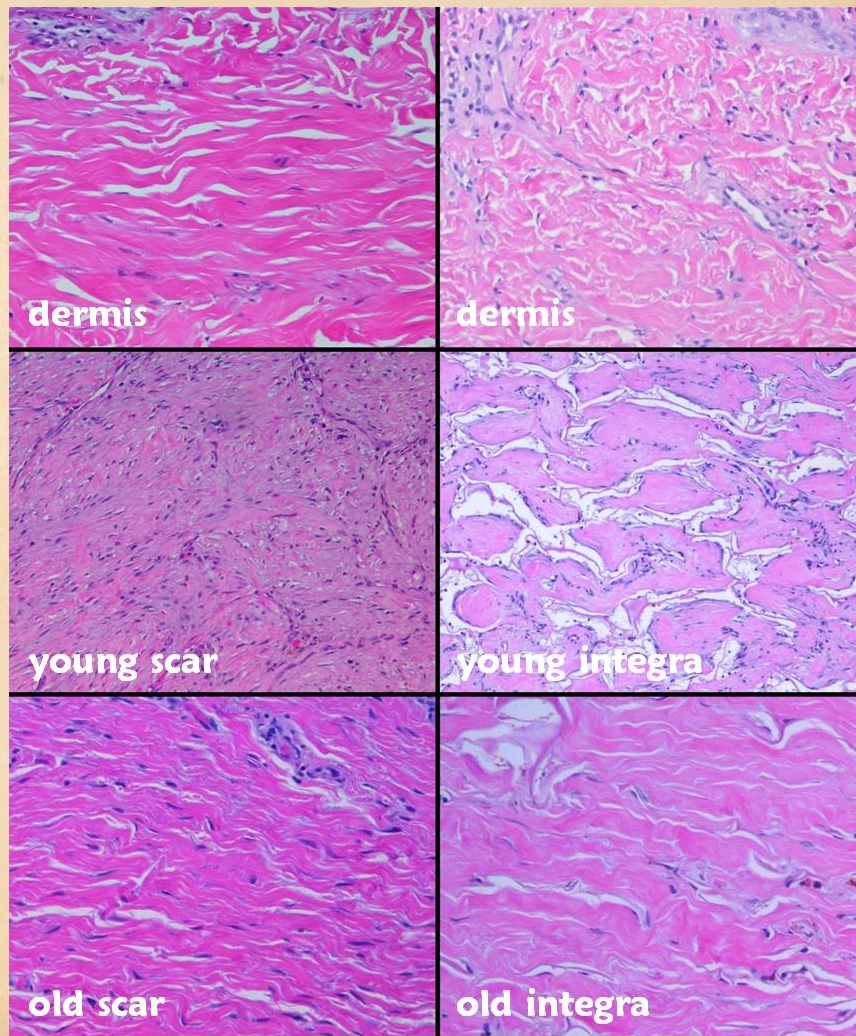
INTEGRA ARRESTS INFLAMMATION

It hides the wound from the host, and it stops destructive events.



INTEGRA STOPS POST-INFLAMMATORY REPAIR

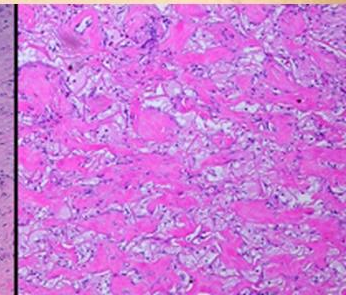
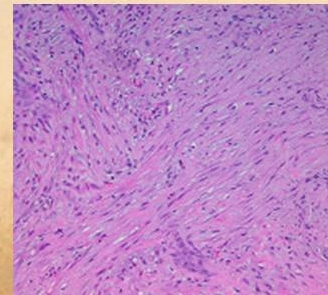
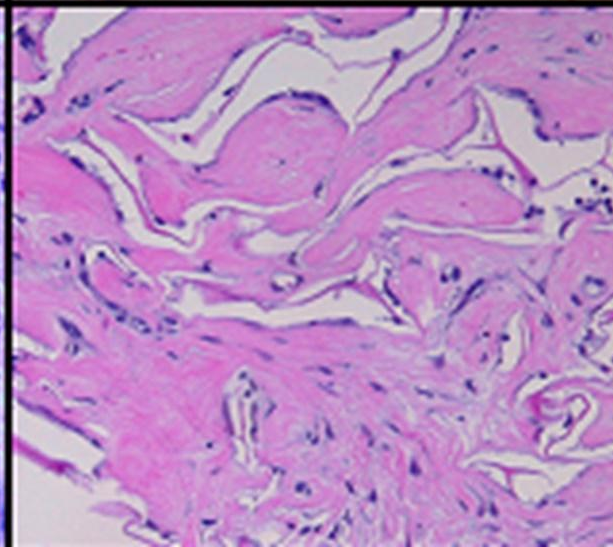
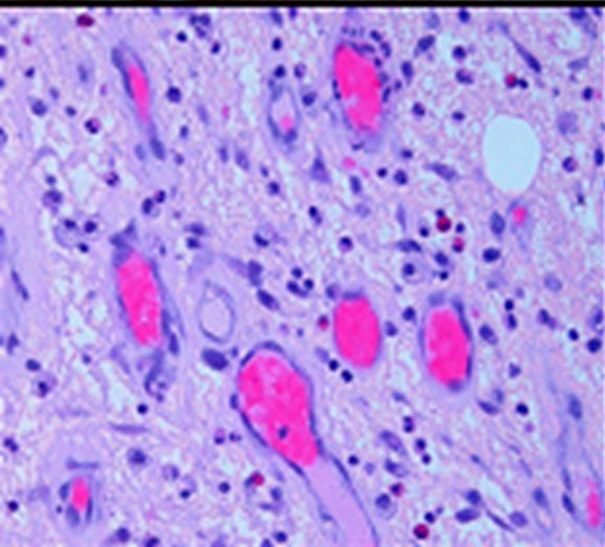
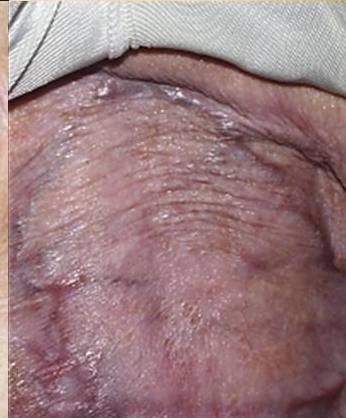
No wound healing means no scar nor its sequelae.



WOUND HEALING VS INTEGRA HISTOGENESIS

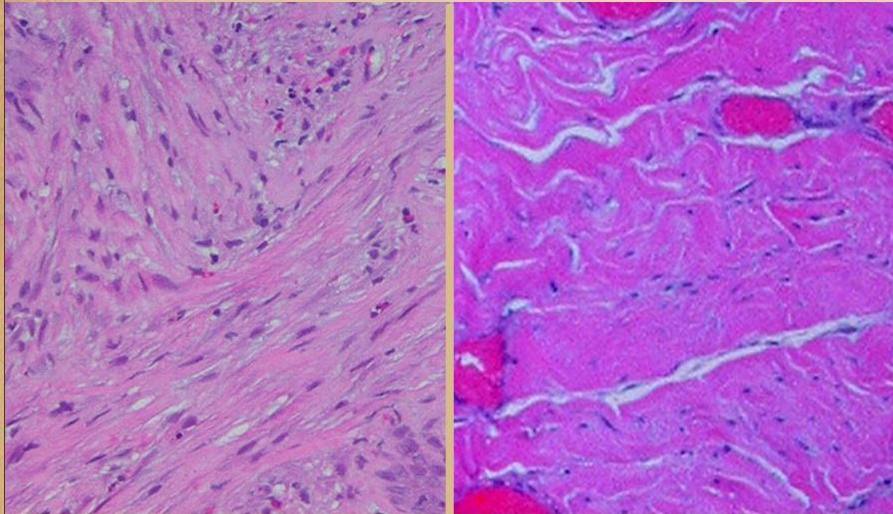
Same cells, same host, same genome.

Different “programs” or “subroutines”,
create different outputs, anatomies, materials.

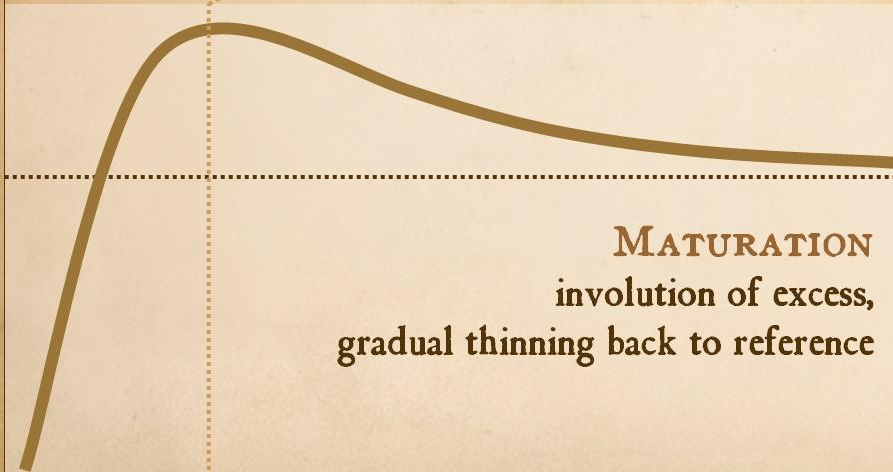


INFLAMMATORY WOUND HEALING

OVERSHOOT, THEN INVOLUTE

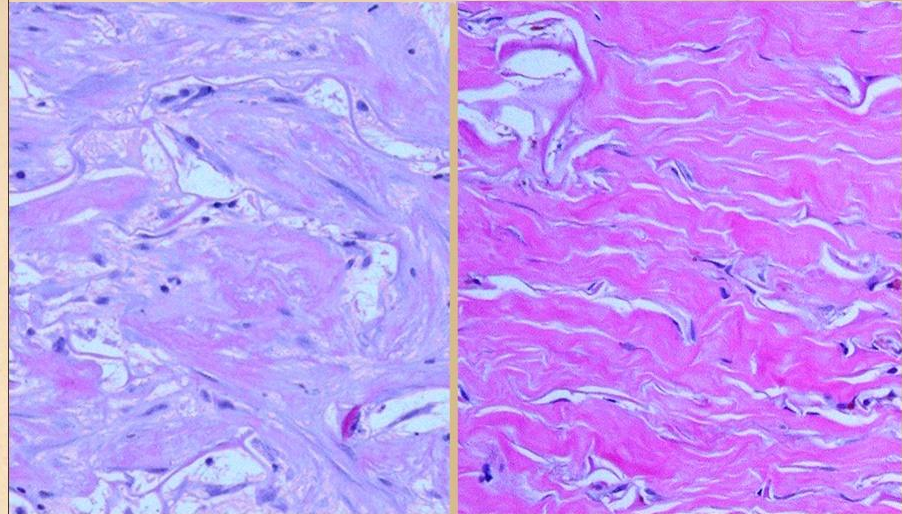


PROLIFERATION
auto-amplifying,
hyper-density,
open loop

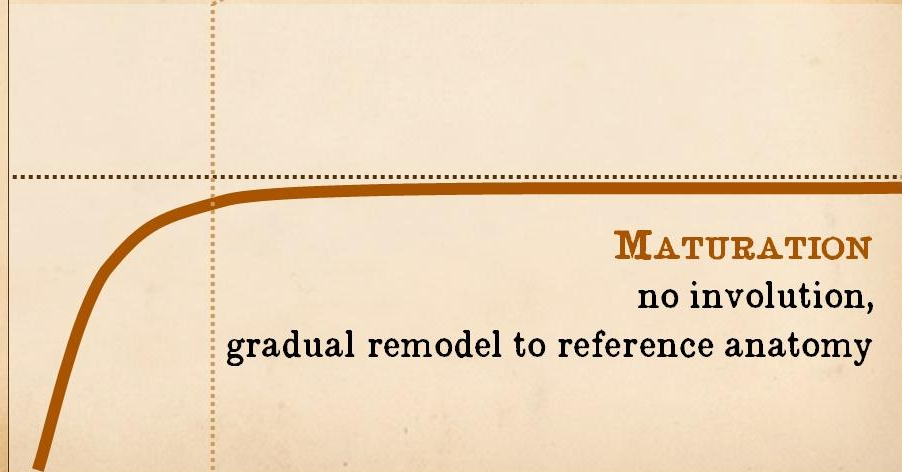


Integra Histogenesis

GRADUALLY BUILD CORRECT MODEL



PROLIFERATION
proper density,
closed loop,
regulated



Integra Collagen-gag Matrix: Key Biologic and Therapeutic Properties

TECHNICAL PROPERTIES

Single agent as both skin substitute and skin regenerant.
Not living, so it tolerates adverse conditions.
Suppresses inflammation and wound healing.
Induces embryonic regeneration.
In situ histogenesis.
Tangential histoconduction.

HIGH QUALITY ARTIFICIAL SKIN

Perceived by host as skin and a closed wound.
Protect wounds and structures.
Minimize symptoms, simplify care.

THERAPEUTIC EFFECTS

Suppress inflammation. Control pathergy.
Stabilize pathological wound behavior.
Prevent and avoid scar.
Independent of physiological wound healing.

SAFETY IN FACE OF RISK

Good results without donor sites.
Safe for high risk patients and conditions.
Safe surgery for immunopathy and ischemia.

CLINICAL UTILITY

Fills many of the roles of conventional flaps.
Succeeds where flaps are ineligible or fail.
Simplifies care.
Minimizes pain and nursing.
Facilitates recuperation, function, lifestyle.
Complex problems managed as an outpatient.

As a method of in situ tissue engineering independent of physiological wound healing, it is a paradigm of surgical wound repair with its own distinctive role for the closure of wounds and reconstruction of defects.

IN SITU TISSUE ENGINEERING WITH INTEGRA EMBRYONIC HISTOGENESIS IN REGENERATIVE MATRICES

Marc E. Gottlieb, MD, FACS Phoenix, AZ

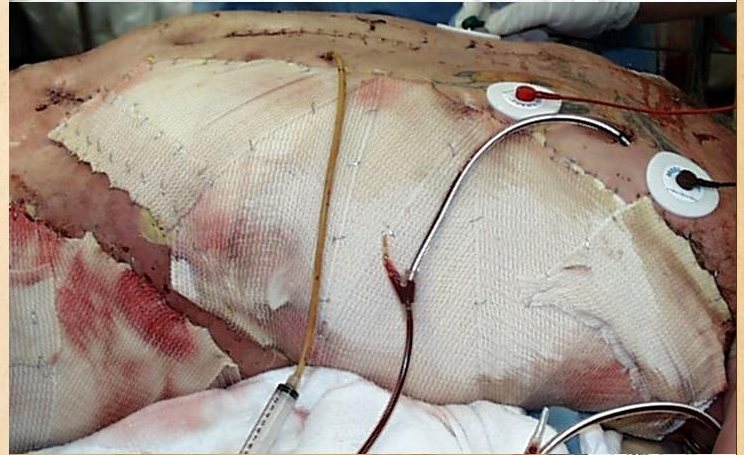
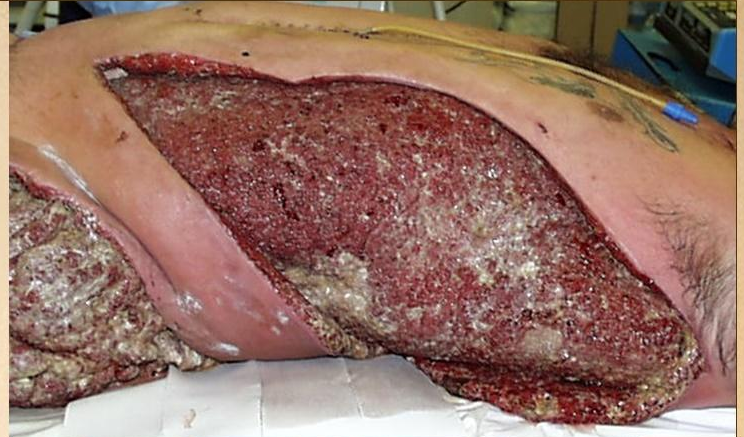
INGEGNERIA DEI TESSUTI IN SITU CON INTEGRA Istogenesi Embrionale in Matrici Rigenerativa



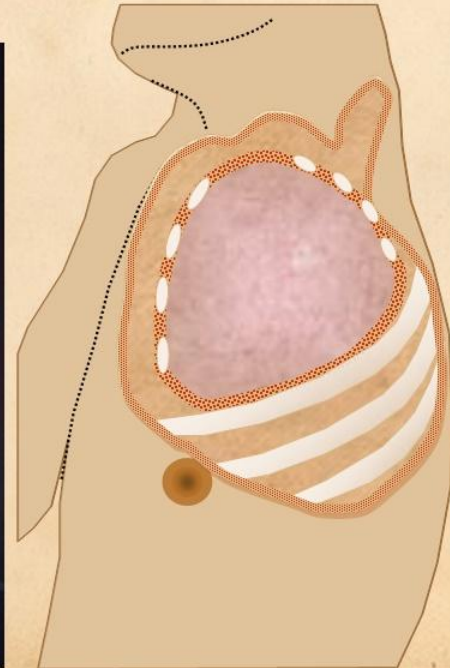
ANTELOPE PEAK.

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REGENERATIVE MATRICES: CRITICAL COVERAGE • BSD • ESSENTIAL COVERAGE • RECONSTRUCTION



REGENERATIVE MATRICES: CRITICAL COVERAGE • BSD • ESSENTIAL COVERAGE • RECONSTRUCTION



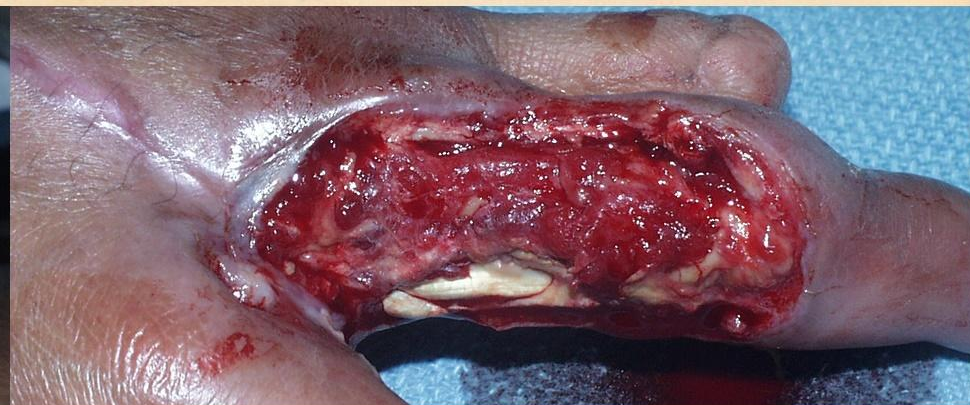
REGENERATIVE MATRICES: CRITICAL COVERAGE • BSD • ESSENTIAL COVERAGE • RECONSTRUCTION

**BIOLOGICAL
SUPERDRESSING**



THE CAVEATS OF CONVENTIONAL WOUND CLOSURE

Circumstances where normal surgery is impossible or ill-advised.

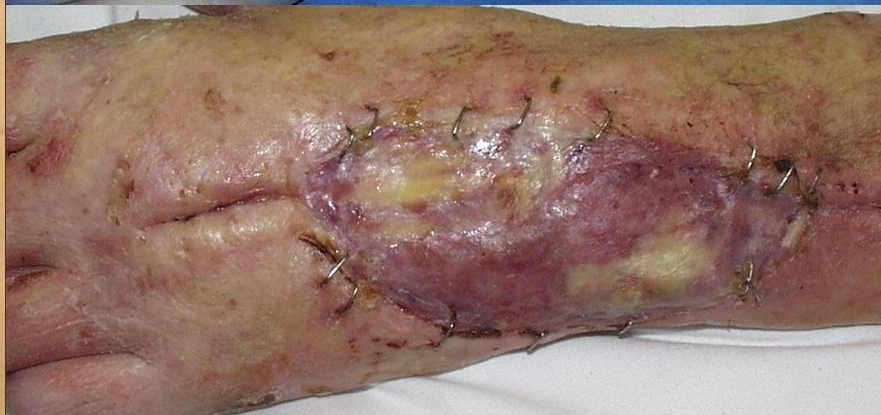


SOLVING PROBLEMS WITH REGENERATIVE MATRICES

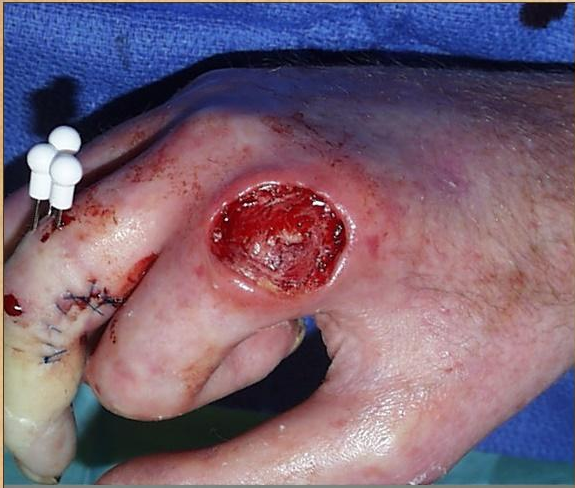
Circumstances where normal surgery is impossible or ill-advised.



REGENERATIVE MATRICES: CRITICAL COVERAGE • BSD • ESSENTIAL COVERAGE • RECONSTRUCTION



REGENERATIVE MATRICES: CRITICAL COVERAGE • BSD • ESSENTIAL COVERAGE • RECONSTRUCTION



REGENERATIVE MATRICES: CRITICAL COVERAGE • BSD • ESSENTIAL COVERAGE • RECONSTRUCTION



MULTIPLE MODES

CRITICAL COVERAGE

BIOLOGICAL SUPERDRESSING

ESSENTIAL COVERAGE

RECONSTRUCTION

REGENERATIVE MATRICES: CRITICAL COVERAGE • BSD • ESSENTIAL COVERAGE • RECONSTRUCTION



REGENERATIVE MATRICES: CRITICAL COVERAGE • BSD • ESSENTIAL COVERAGE • RECONSTRUCTION



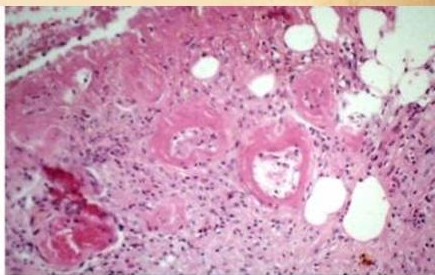


Outcome type 1a
Nominal reconstruction, healed
 (#1) 65 F, Wegener's granulomatosis



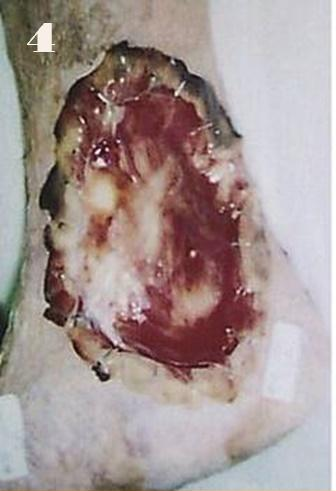
Outcome type 1b
Healed after ancillary care
 (#2) 69 F, rheumatoid, hypercoagulable

Outcome type 1d
Healed after second Integra
 (#3) 69 F, hypercoagulable



2

3



Outcome type 2a
 -
 Partial success,
 healed after secondary flap
 (#4) 86 F, venous

Outcome type 2c
 -
 persistent open Integra
 (#5) 75 M, venous

Diagnosis
 -
 Venous
 (#6) 77 F

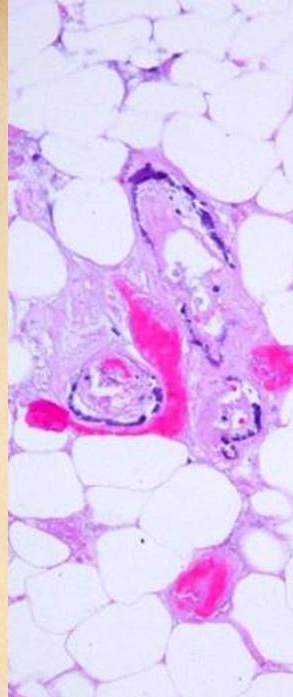


Diagnosis - Immunopathic
(#7) 71 F

Diagnosis - Hypercoagulable
(#8) 61 F

Diagnosis - Mechanical
(#9) 79 F





Location Upper Extr. Hand	Location Upper Extremity	Location Lower Extr. Leg	Location Lower Extr. Foot & ankle
(#10) 42 F diabetes aso / pvod	(#11) 51 F diabetes, hPTH calcinosis	(#12) 77 F Sjögren's	(#13) 77 M Rheumatoid



14

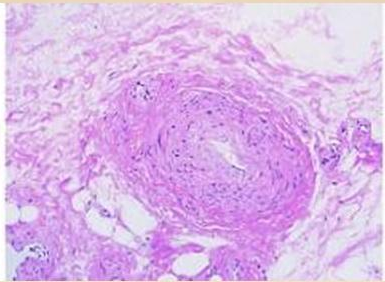


Exposed structure
-
Bone
(#14) 33 M
venous



Exposed structure
-
Joint
(#15) 43 M
scleroderma

Exposed structure
-
Hardware
(#16) 50 F
trauma





Adjunct use
Bone & radiation
(#17) 14 M
radiation

Class
Arterial disease
(#18) 64 M
atherosclerosis

Class
Arterial disease
(#19) 74 M
aso, dm



20



21



Select problem
Achilles

(#20) 44 F, mechanical, hypercoag

Select problem
Heel

(#21) 84 F, dm, atherosclerosis

Select problem
Stump salvage

(#22) 53 M, dm, atherosclerosis



22

23



Select
problem
-
**Limb
preservation**

(#23) 67 F,
aso / pvod

24



Select
problem
-
**Superiority
to
conventional
choices**

(#24) 60 M,
dm,
aso / pvod

Biological Effects of Integra

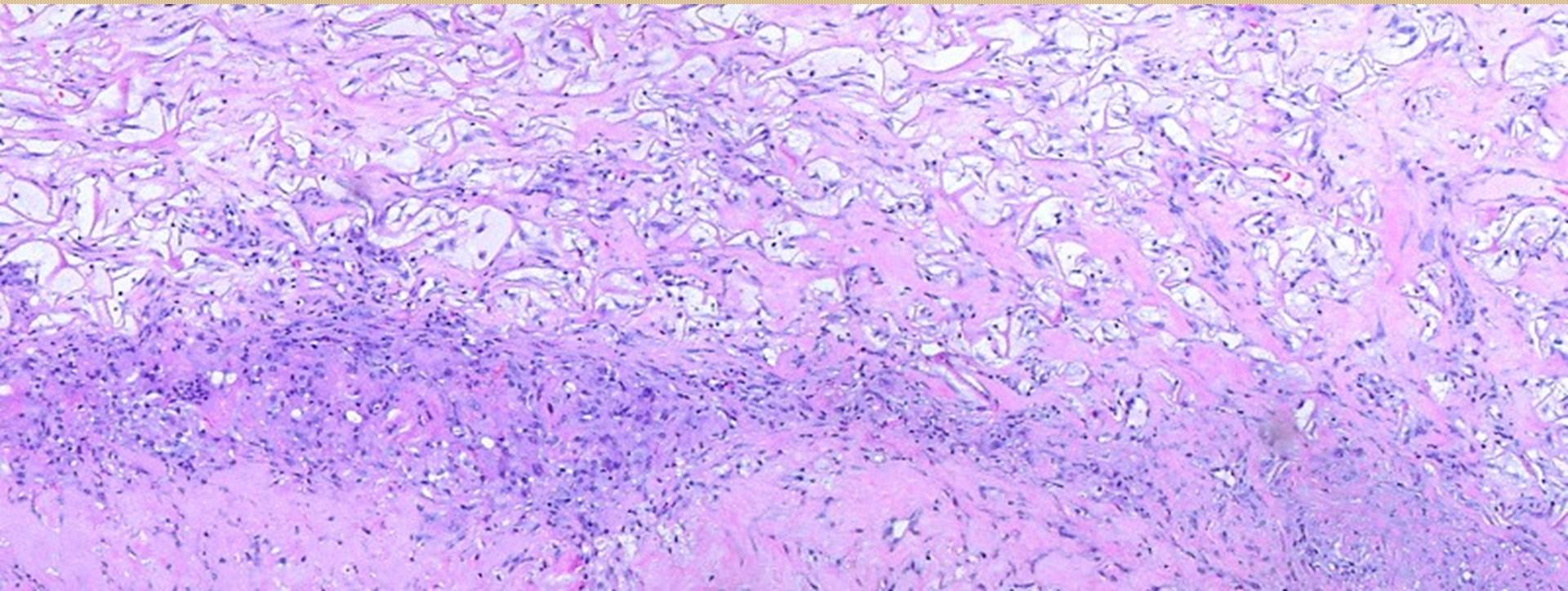
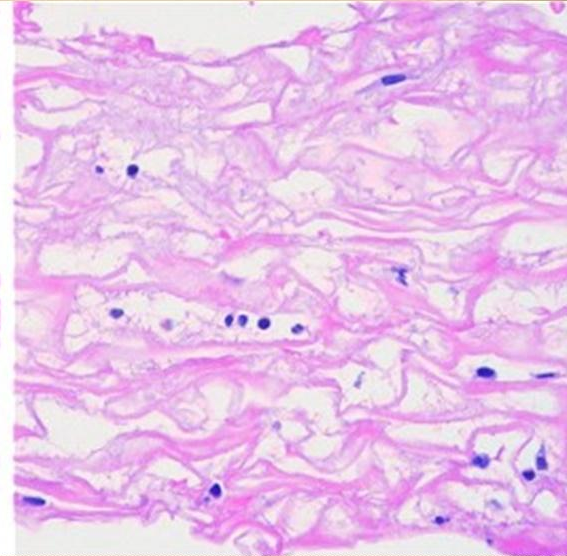
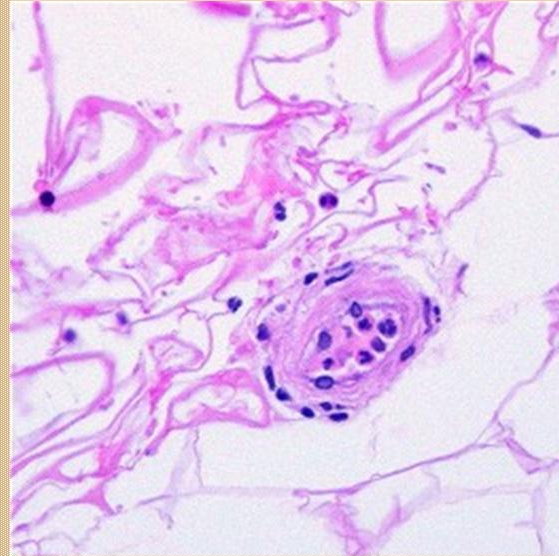
Acute Physiological Effects

Suppresses inflammation and its effects

Suppresses pathergy

Immediate closure of wound

Recognition as normal tissue



Biological Effects of Integra

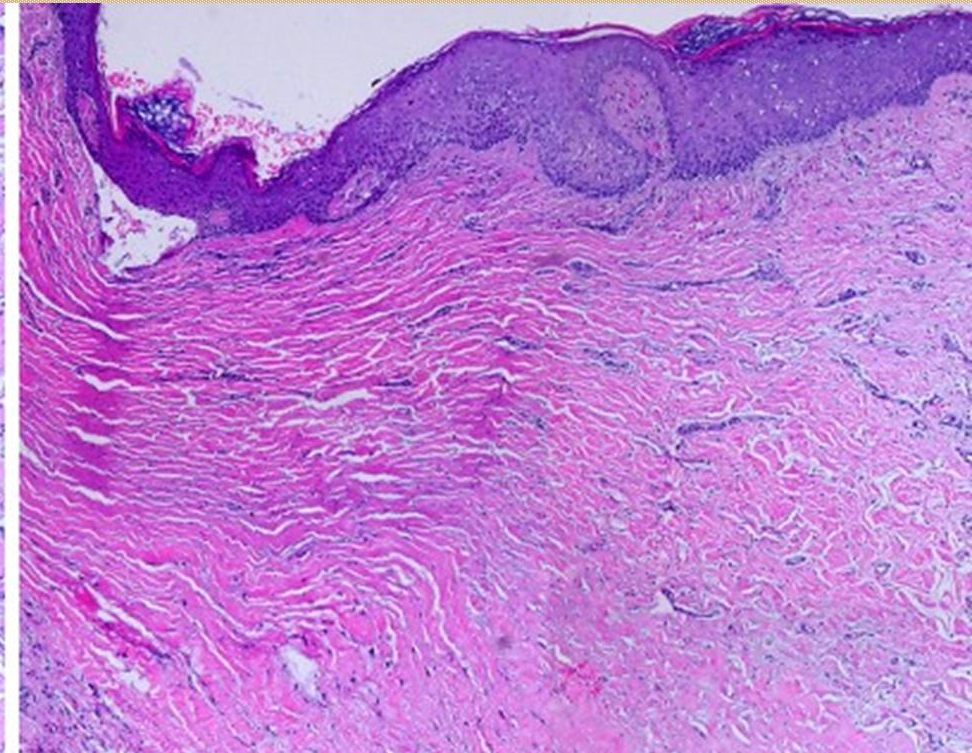
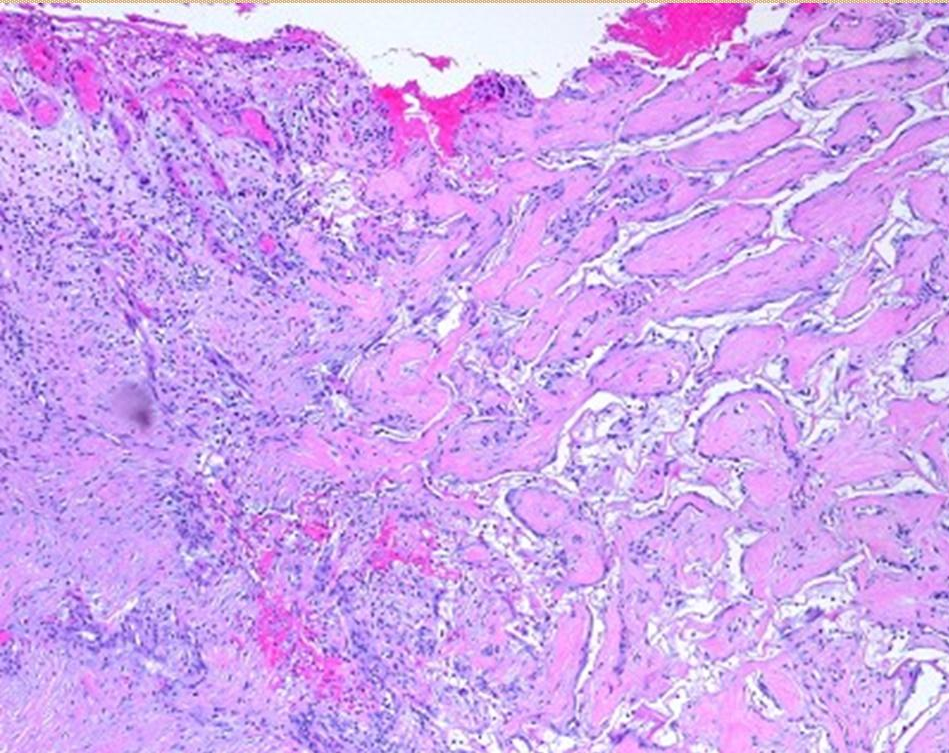
Sub-Acute Physiological Effects

Suppresses normal inflammatory wound repair

Induction of embryonic histogenesis

Formation of dermis

Avoidance of scar



Summary

Study

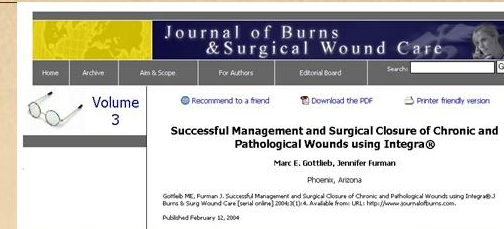
72 months
111 patients
165 ulcers
173 exposed structures
full range of diagnoses

Results

71% - healed by Integra
20% - partial
9% - failed

90% - closure of exposed structures

92% success
if poor risk ulcers are eliminated
extreme arterial disease
diabetic plantar neuropathy



Management

Up to 7 months to heal
(acceptable to patients).
Ideally suited to outpatient care.
Superior safety profile.

Indications


Defined indications, related to:
complexity of wound,
anatomical complications,
high risk patients – wounds – diseases,
absence of conventional options.

Paradigm of Care

In situ tissue engineering.
Independent of repair, grafts, flaps.
Select Integra for its own merits.

**Journal of Burns
& Surgical Wound Care**

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Successful Management and Surgical Closure of Chronic and Pathological Wounds using Integra®

Marc E. Gottlieb, Jennifer Furman

Phoenix, Arizona

Gottlieb ME, Furman J. Successful Management and Surgical Closure of Chronic and Pathological Wounds using Integra®. J Burns & Surg Wound Care [serial online] 2004;3(1):4. Available from: URL: <http://www.journalofburns.com>.

Published February 12, 2004

Integra is the ideal solution for the management of certain acute wounds, reconstructive problems, and chronic and pathological wounds.

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ספר חנוכה

ו

חנוכה

