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M1 Patients and Populations:

Inflammation and Repair IV

Outcomes of Acute Inflammation

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Fall 2008

University of Michigan
Medical School

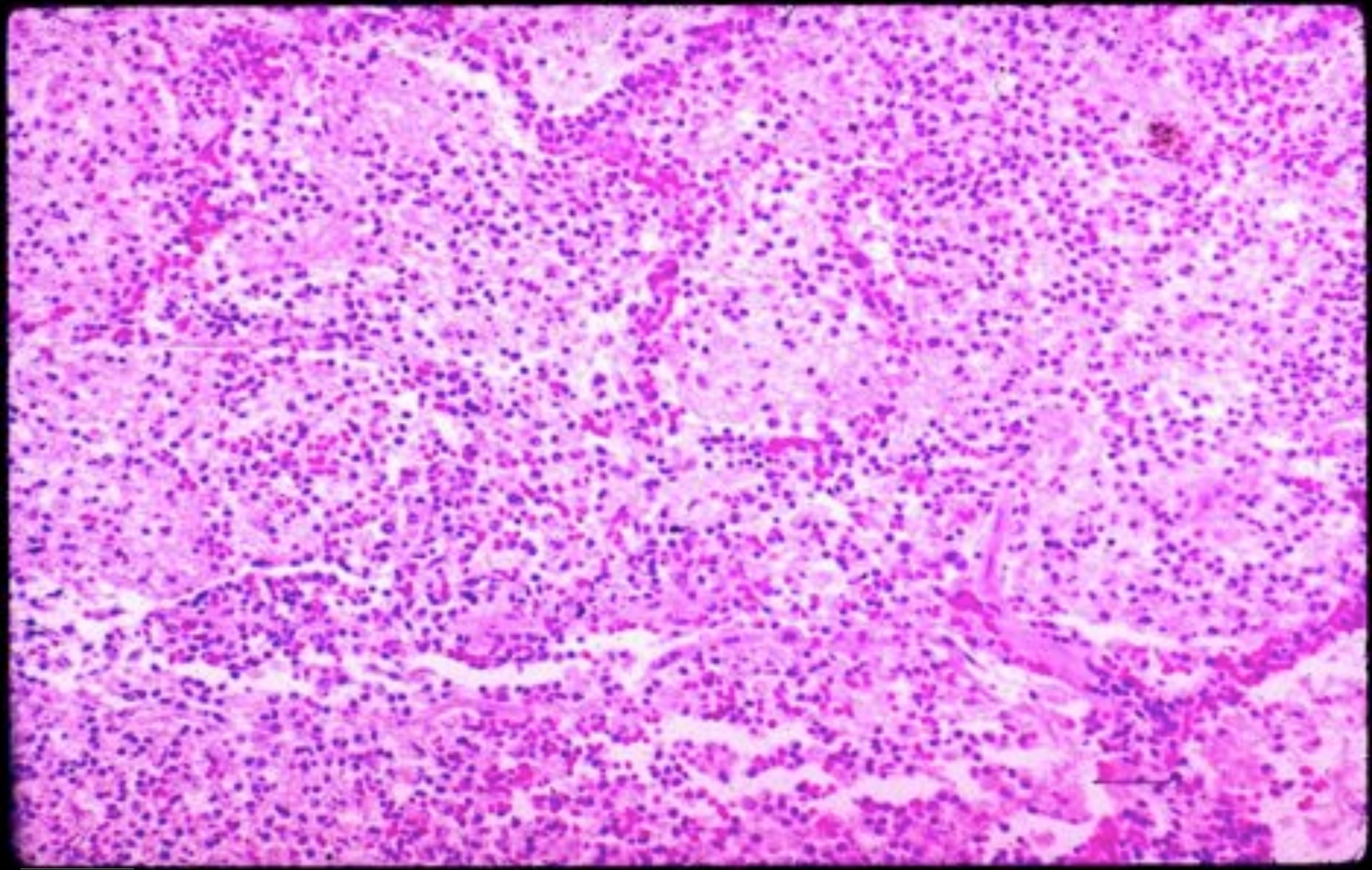
The Inflammatory response

1. vascular response-fluid exudate
2. cellular response-leukocytic exudate
3. macrophages
4. exudates-non-cellular, cellular, mixed
5. granulomas-granulomatous inflammation
6. **fate of the inflammatory reaction**
7. **healing and scar formation**
8. **healing of cutaneous wounds**
9. **chronic inflammation**

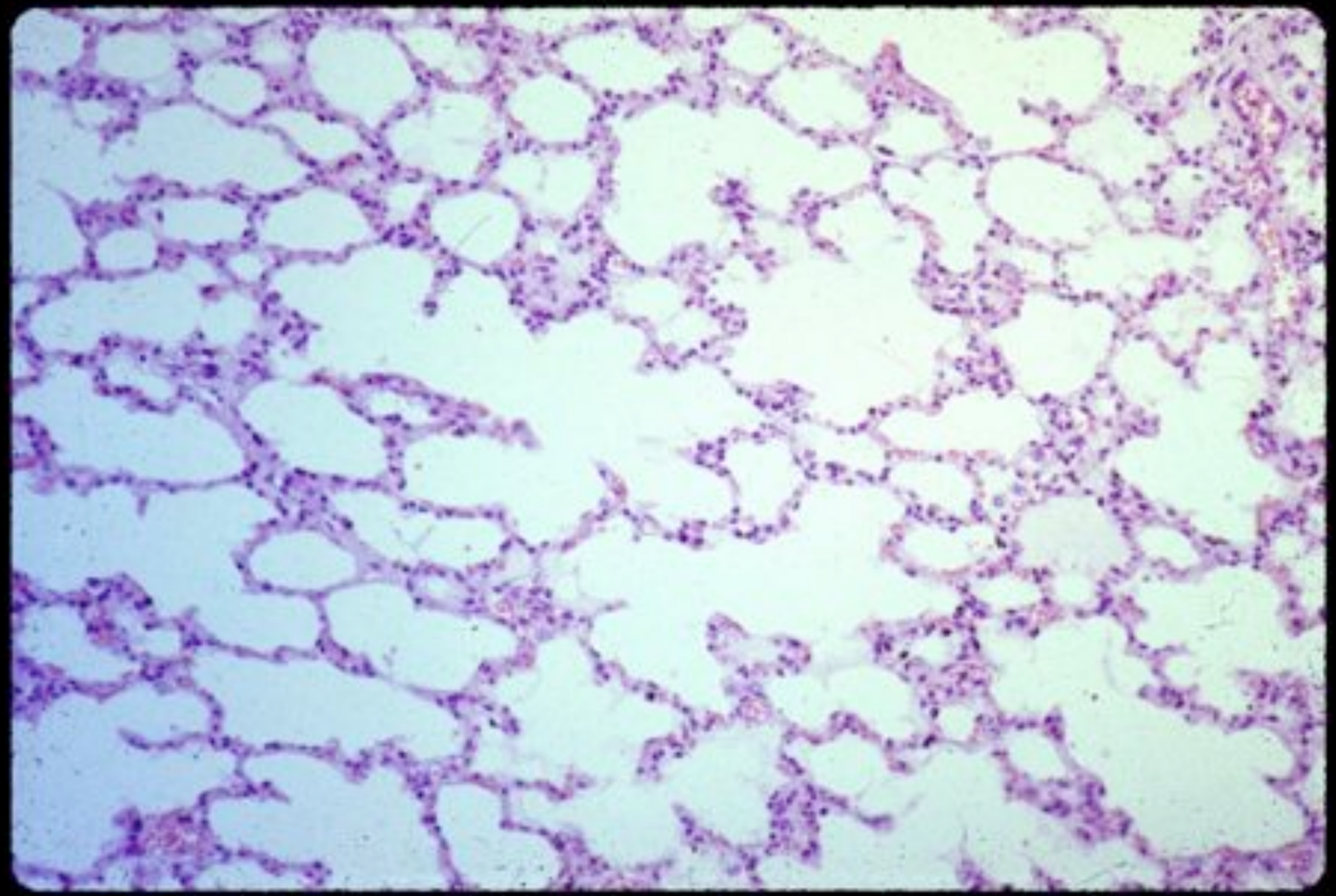
Possible Outcomes of Acute Inflammation

- Resolution
- Healing with Scar
- Chronic Inflammation

Purulent Pneumonia



Resolution – Normal Lung



HEALING

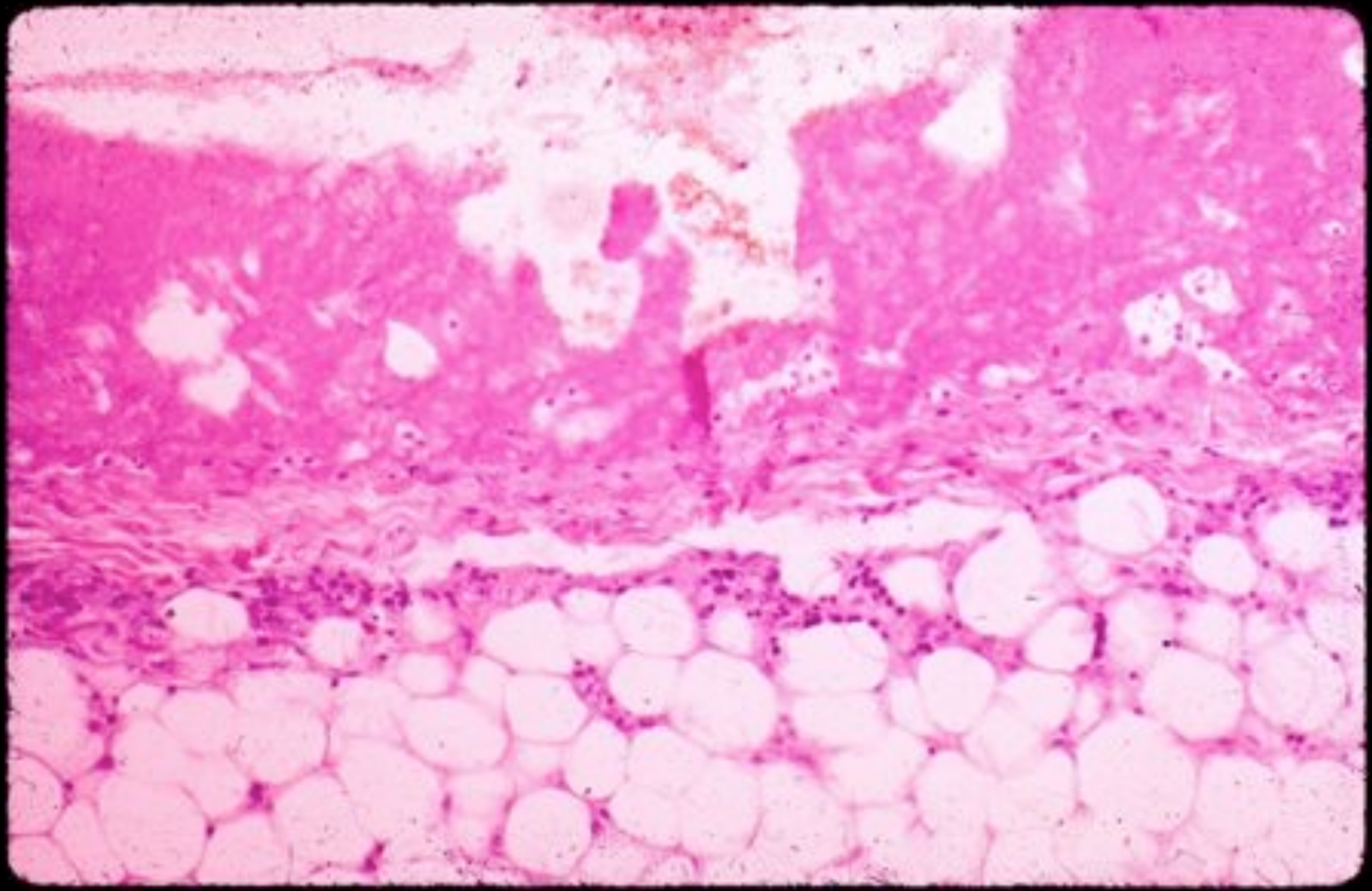
- SCAR FORMATION
- REGENERATION

GRANULATION TISSUE

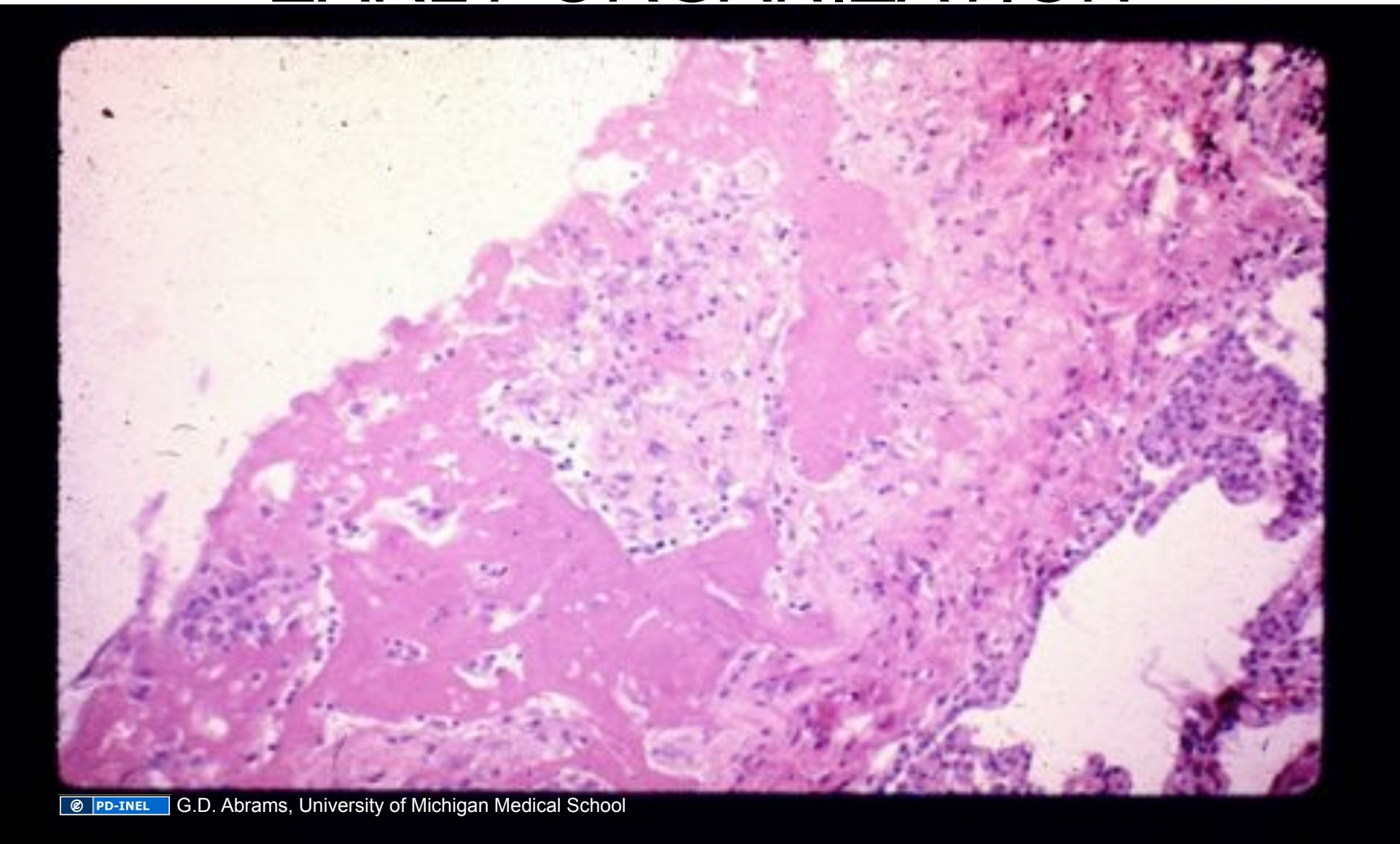
- Loose,young connective tissue with proliferating fibroblasts and endothelial cells. Granulation tissue “matures” to form scar.

- The process of granulation tissue ingrowth is termed “organizaton”.

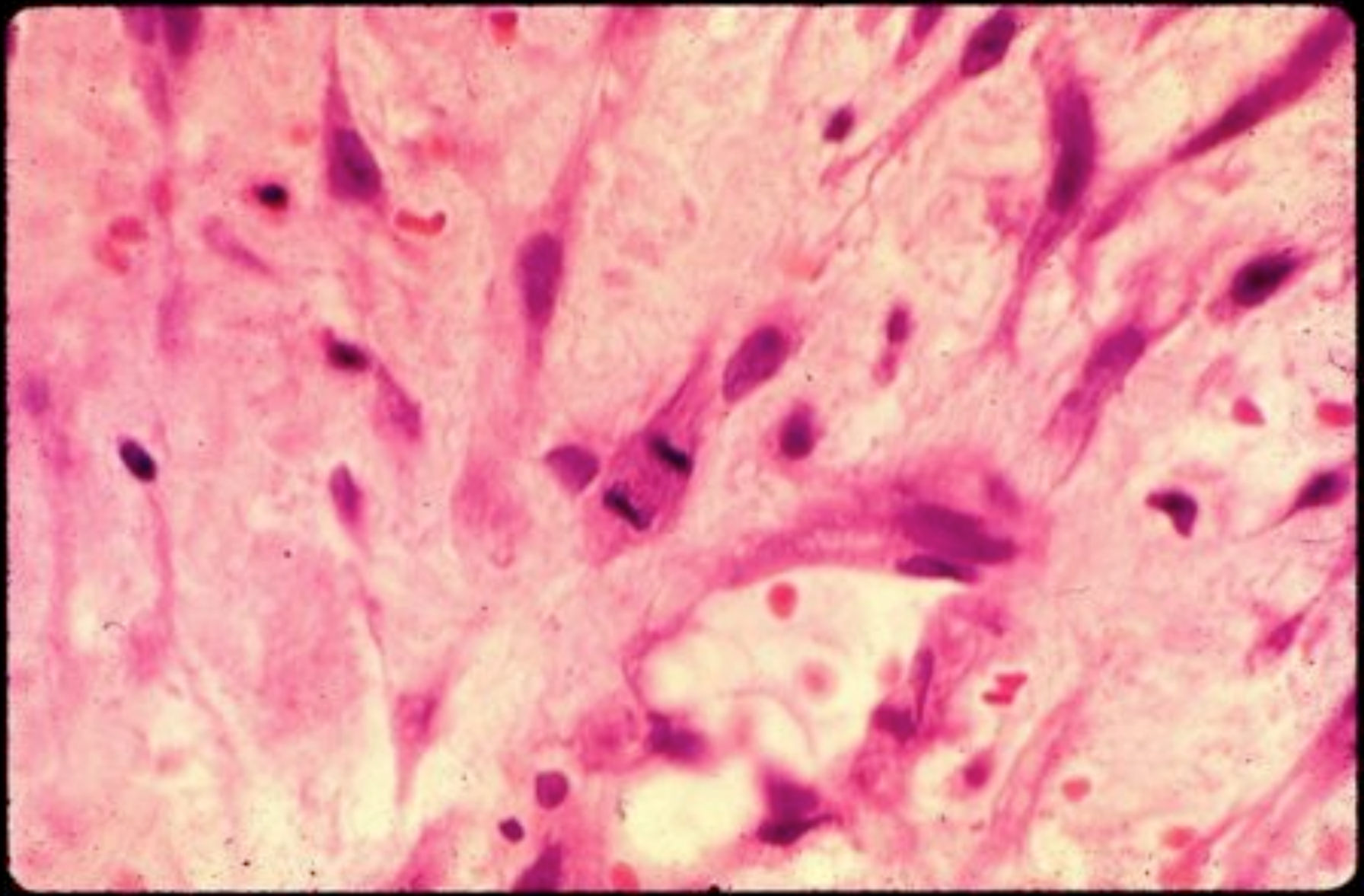
FIBRINOUS EXUDATE



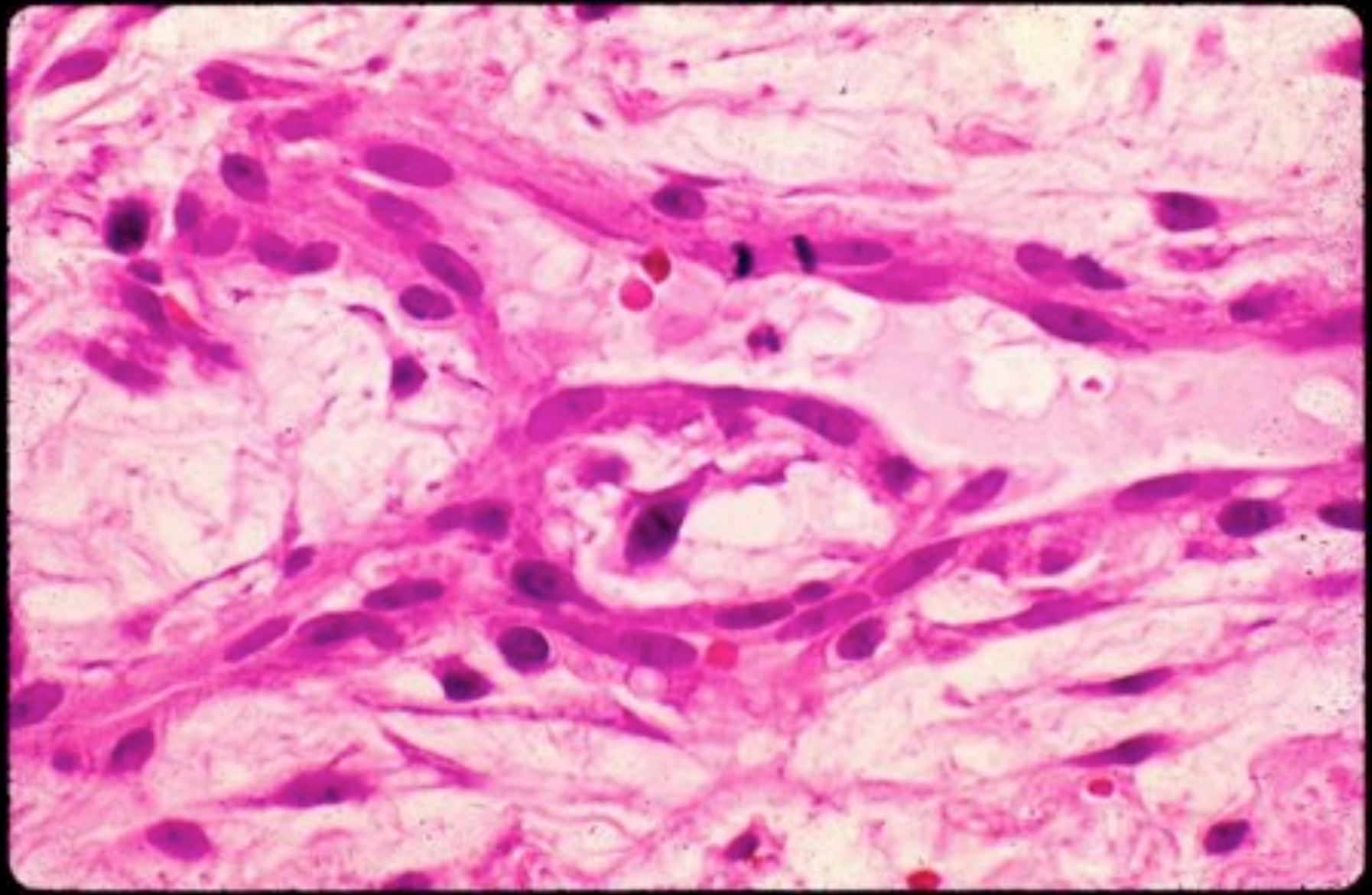
FIBRINOUS EXUDATE
EARLY ORGANIZATION



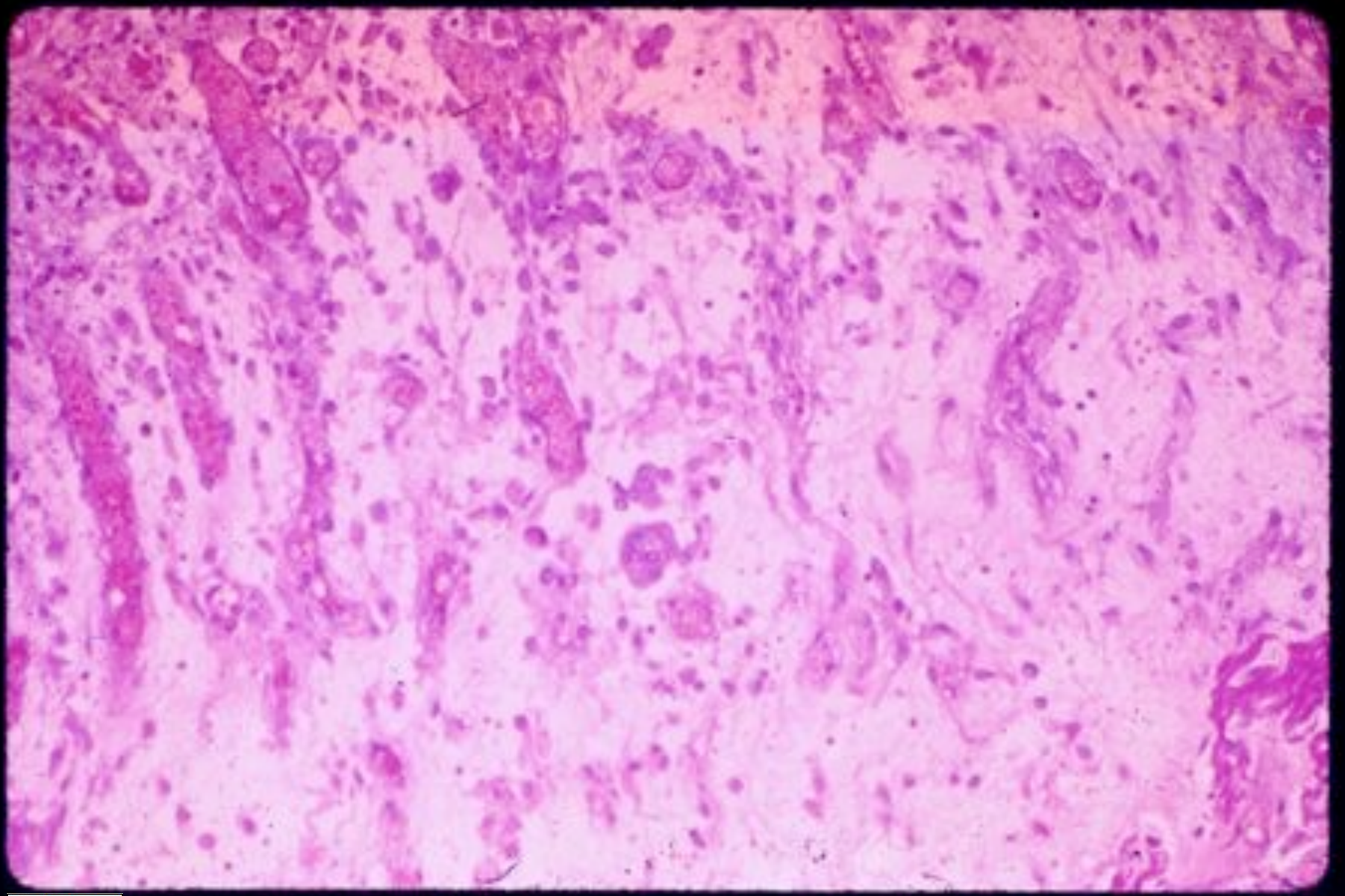
FIBROBLAST PROLIFERATION



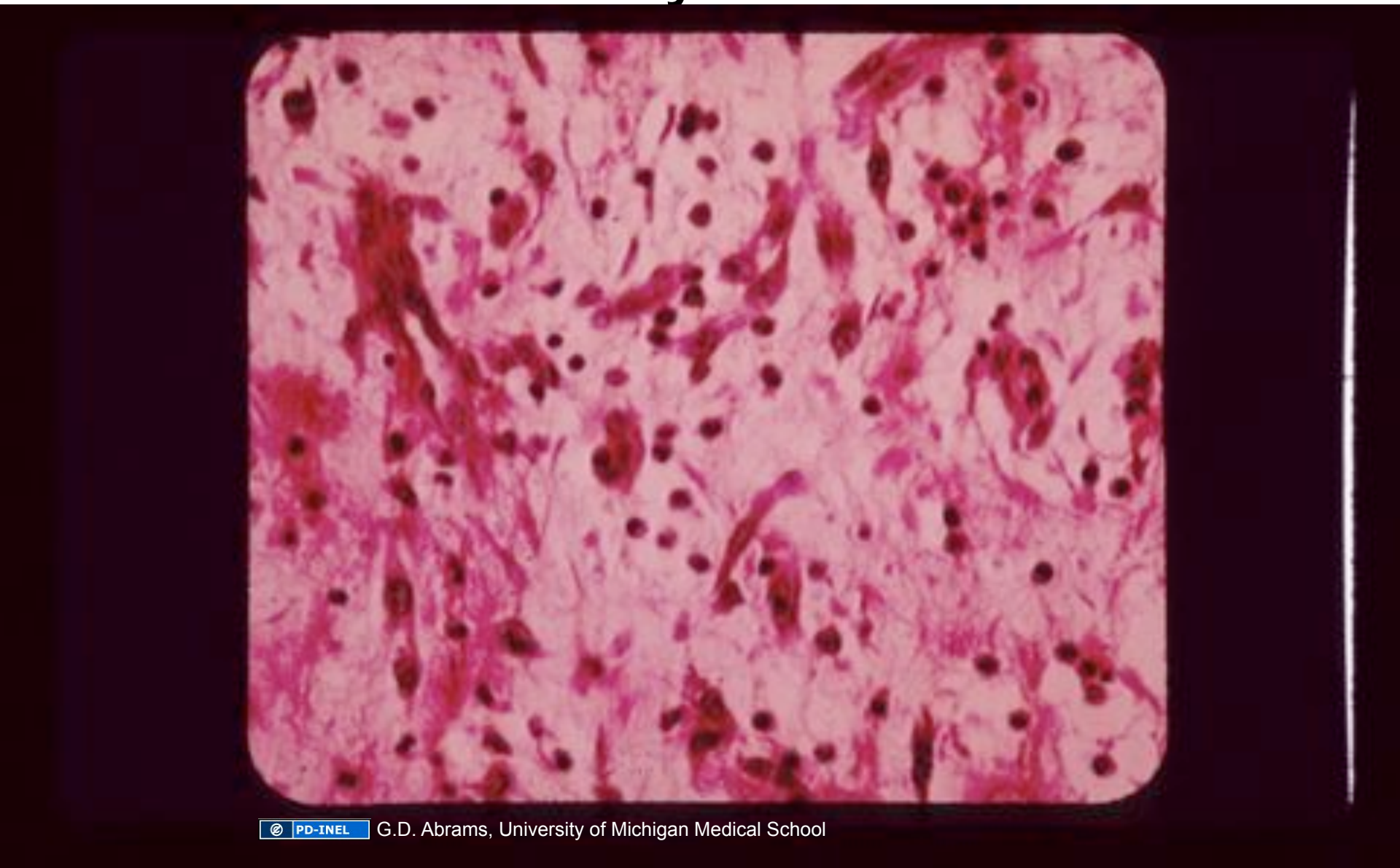
ENDOTHELIAL PROIFERATION



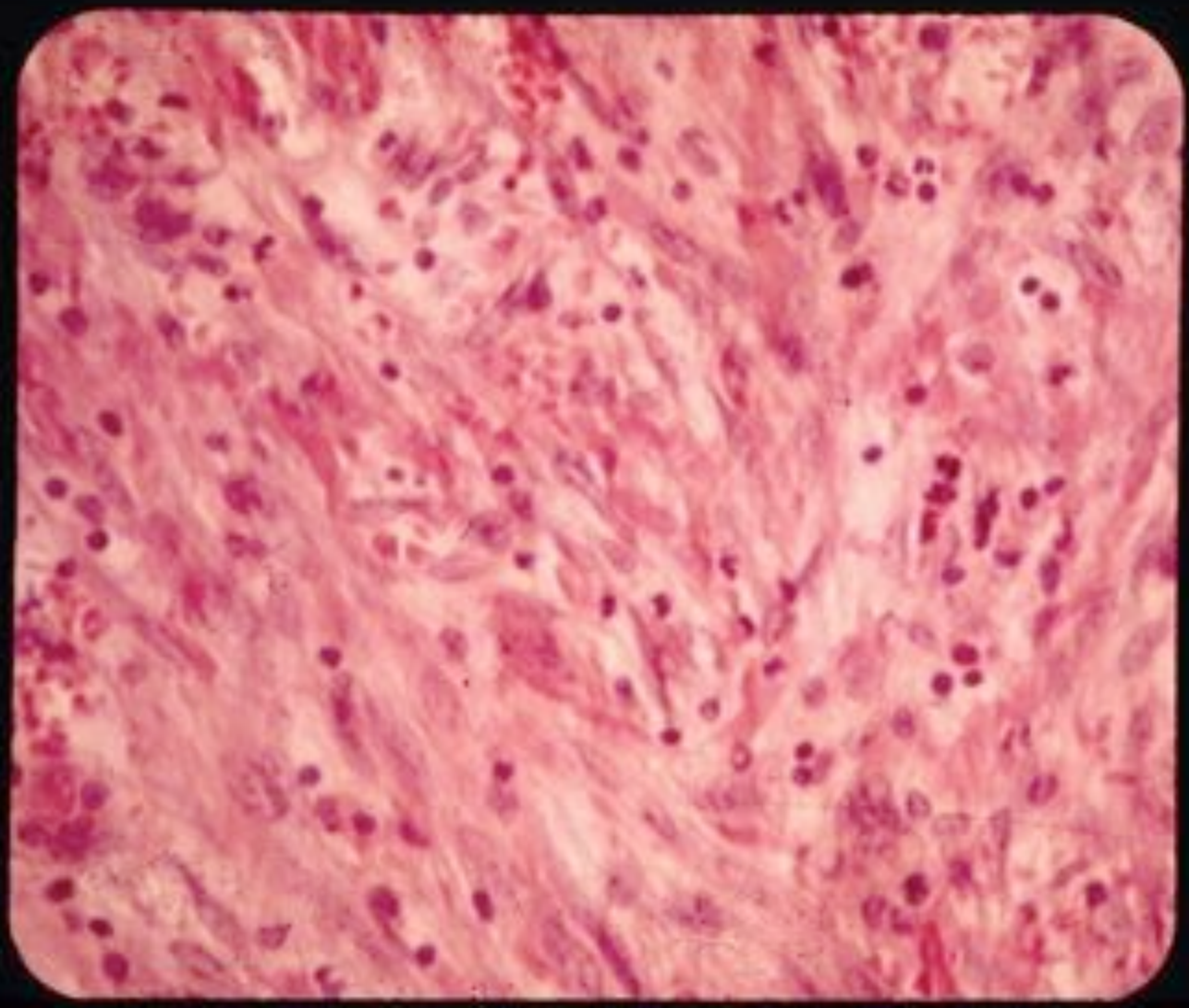
GRANULATION TISSUE



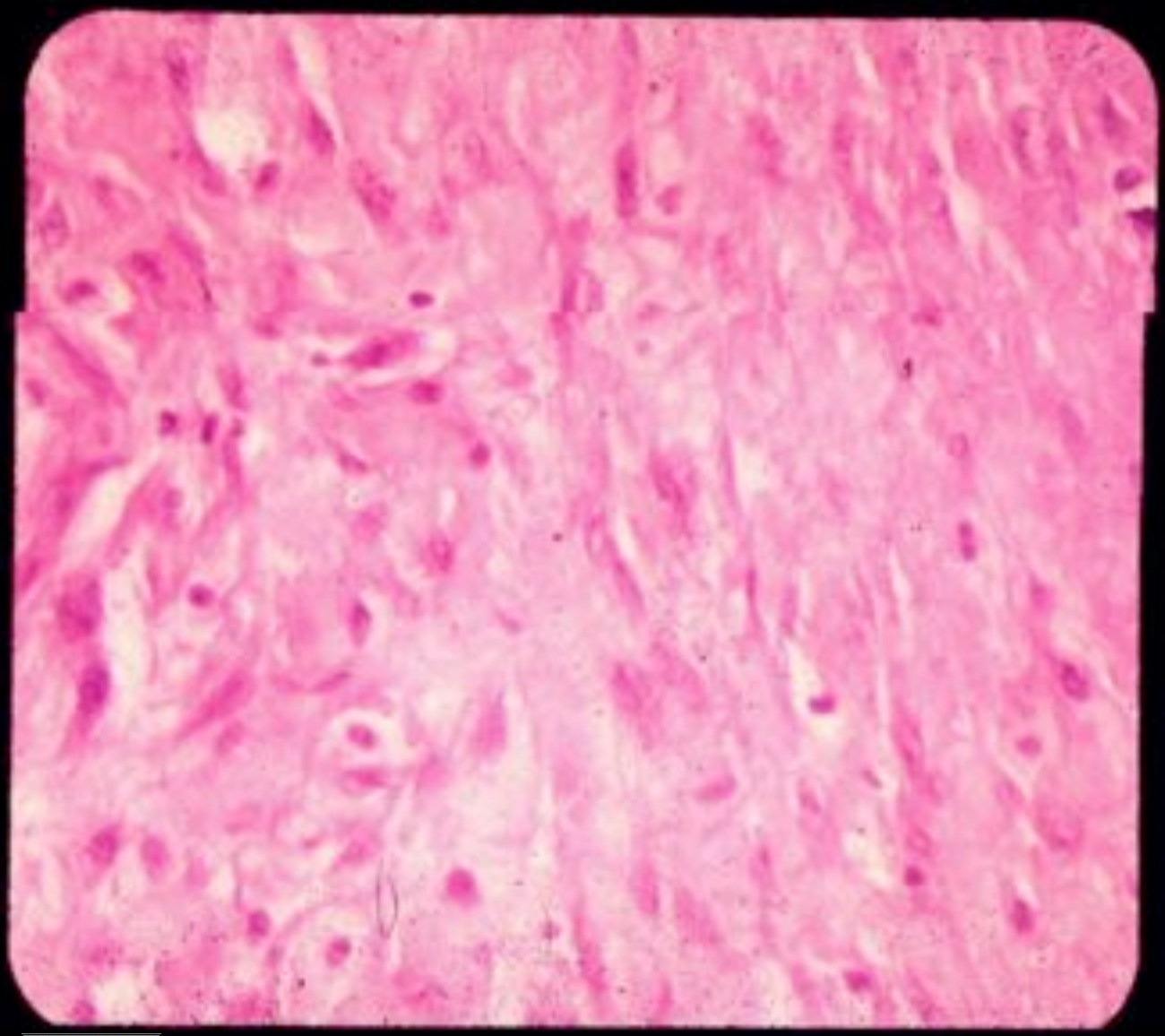
GRANULATION TISSUE
Day 5-7



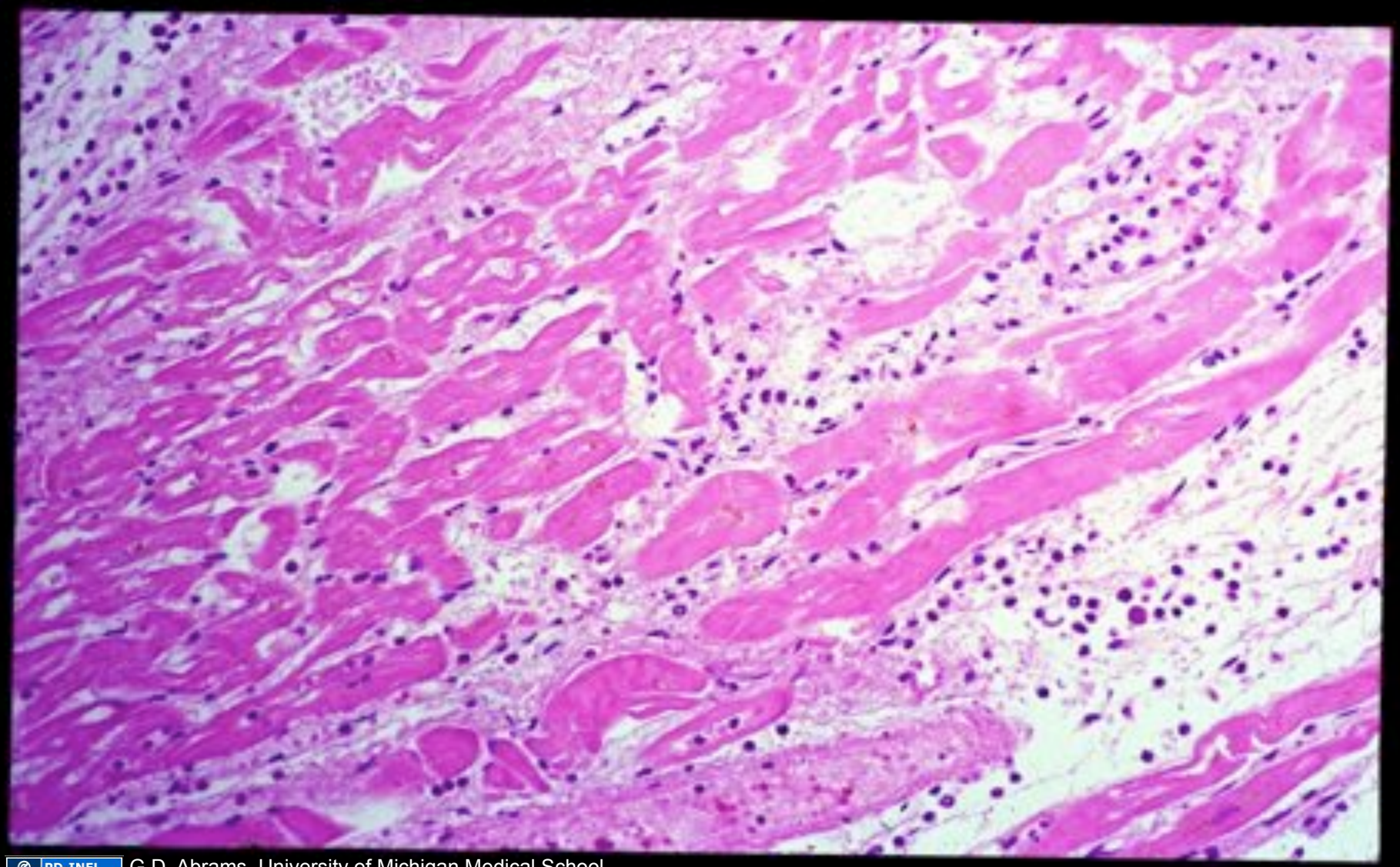
GRANULATION TISSUE
Second Week



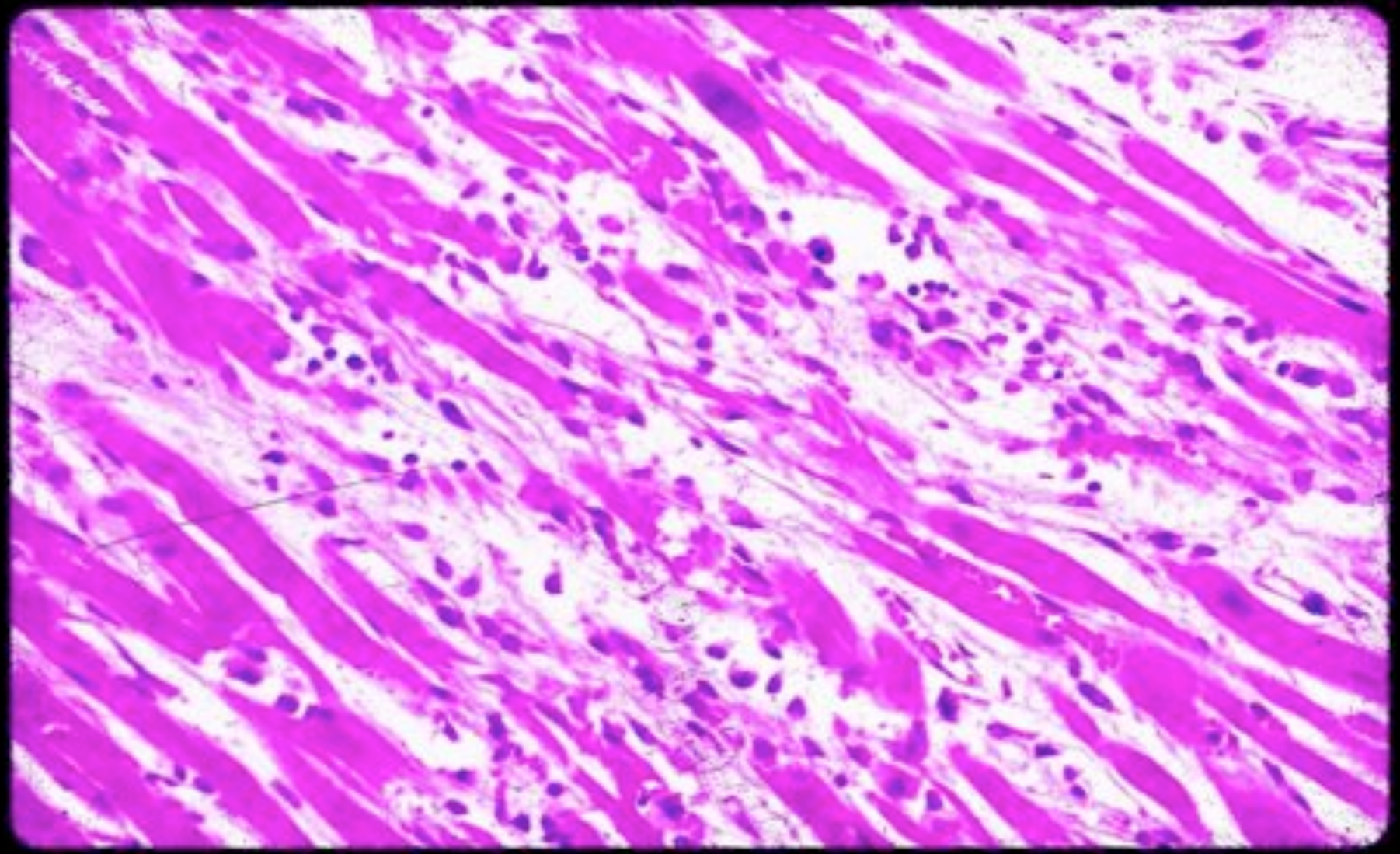
MATURING SCAR



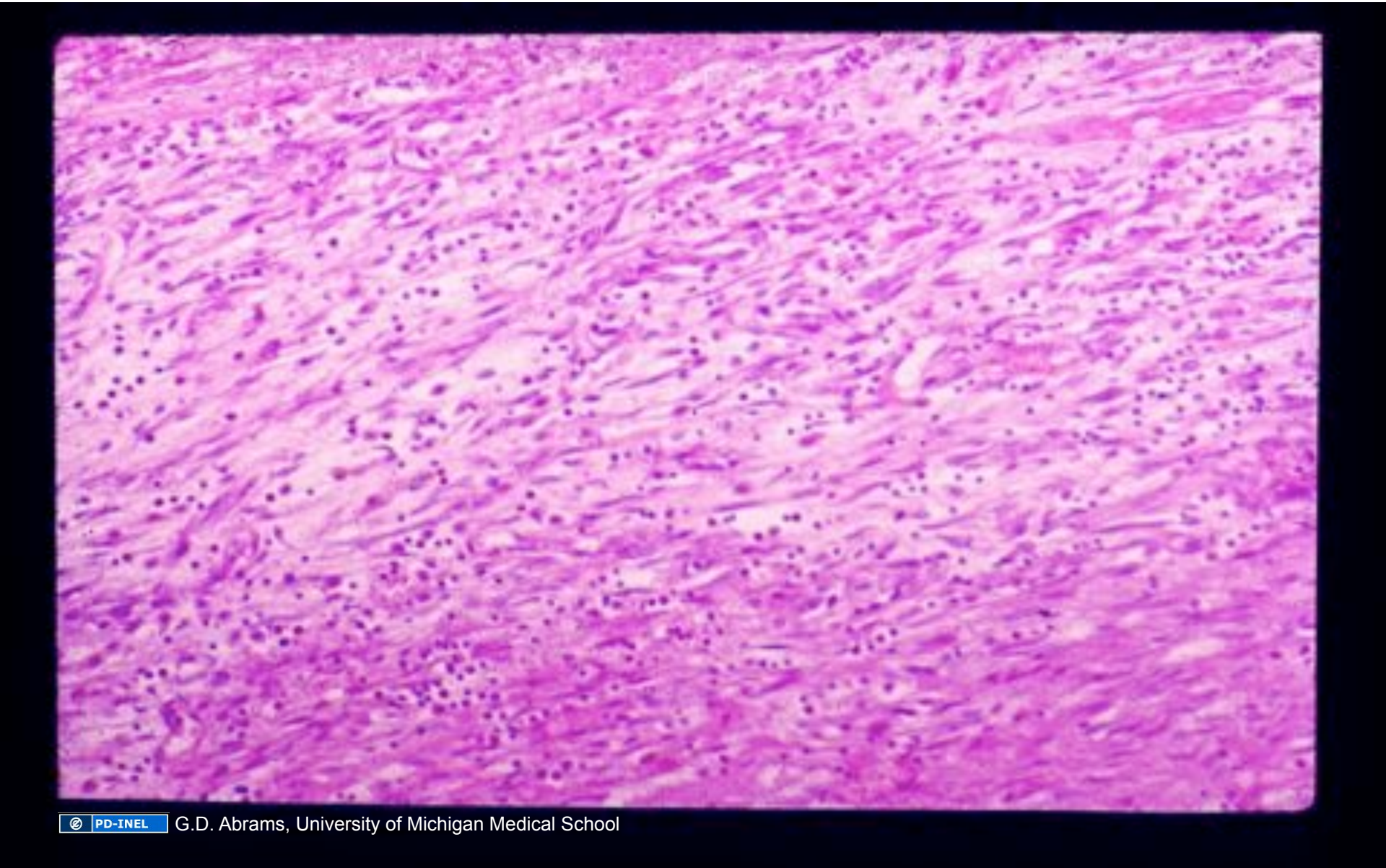
NECROTIC MYOCARDIUM
Day 1-2



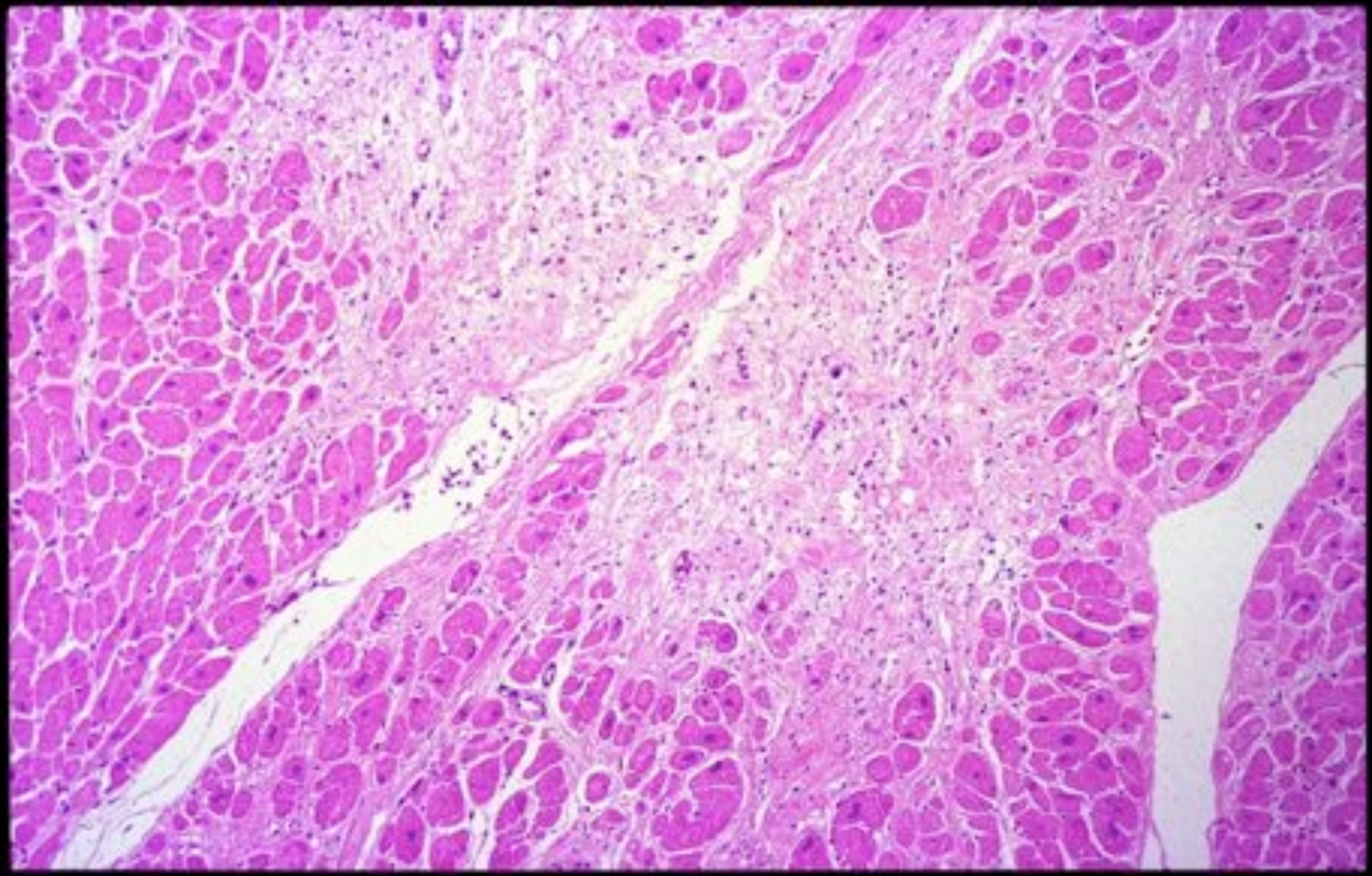
NECROTIC MYOCARDIUM
Day 5-6



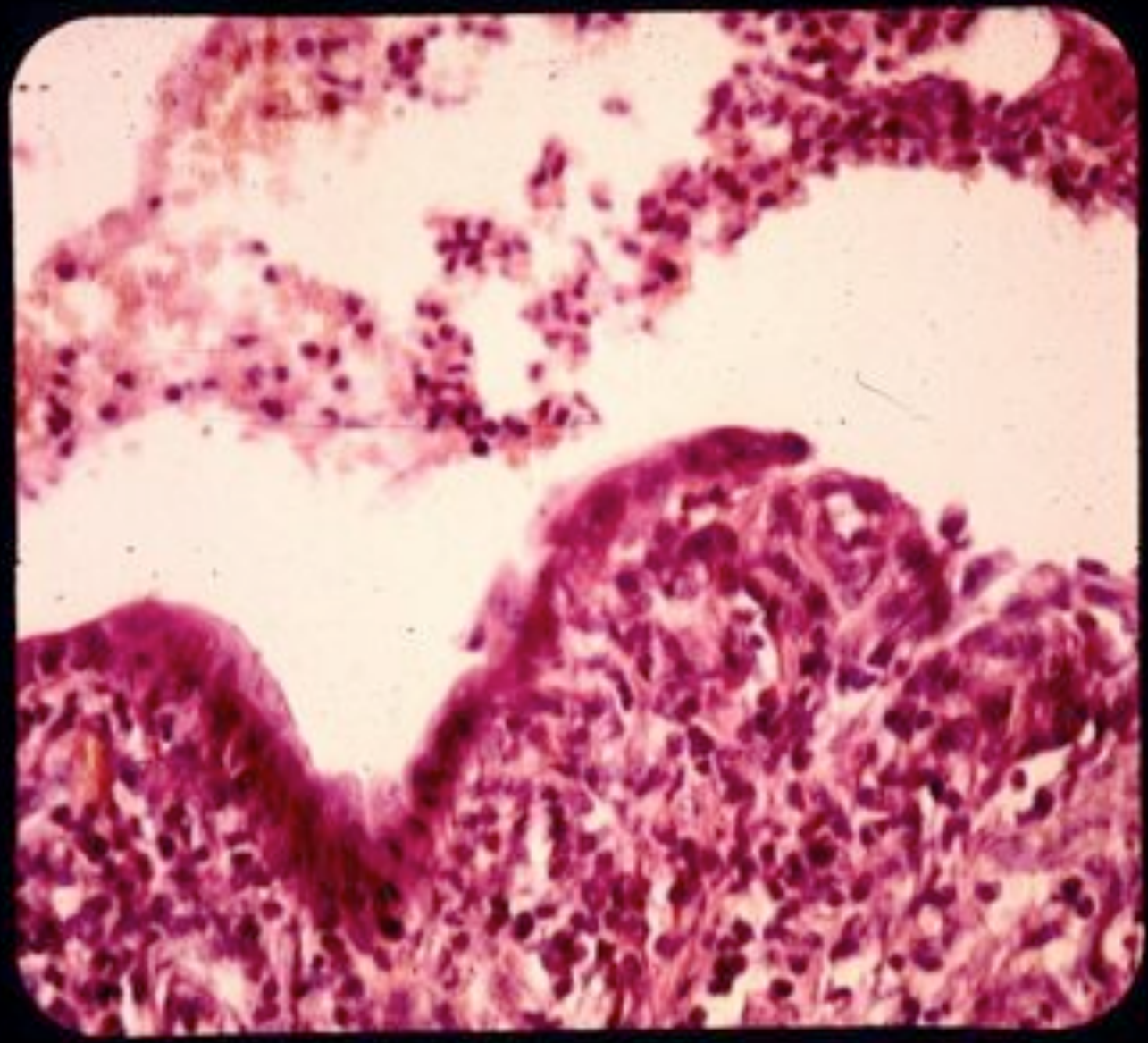
NECROTIC MYOCARDIUM
Second Week



MYOCARDIAL SCAR



EPITHELIAL REGENERATION



HEALING OF CUTANEOUS WOUNDS

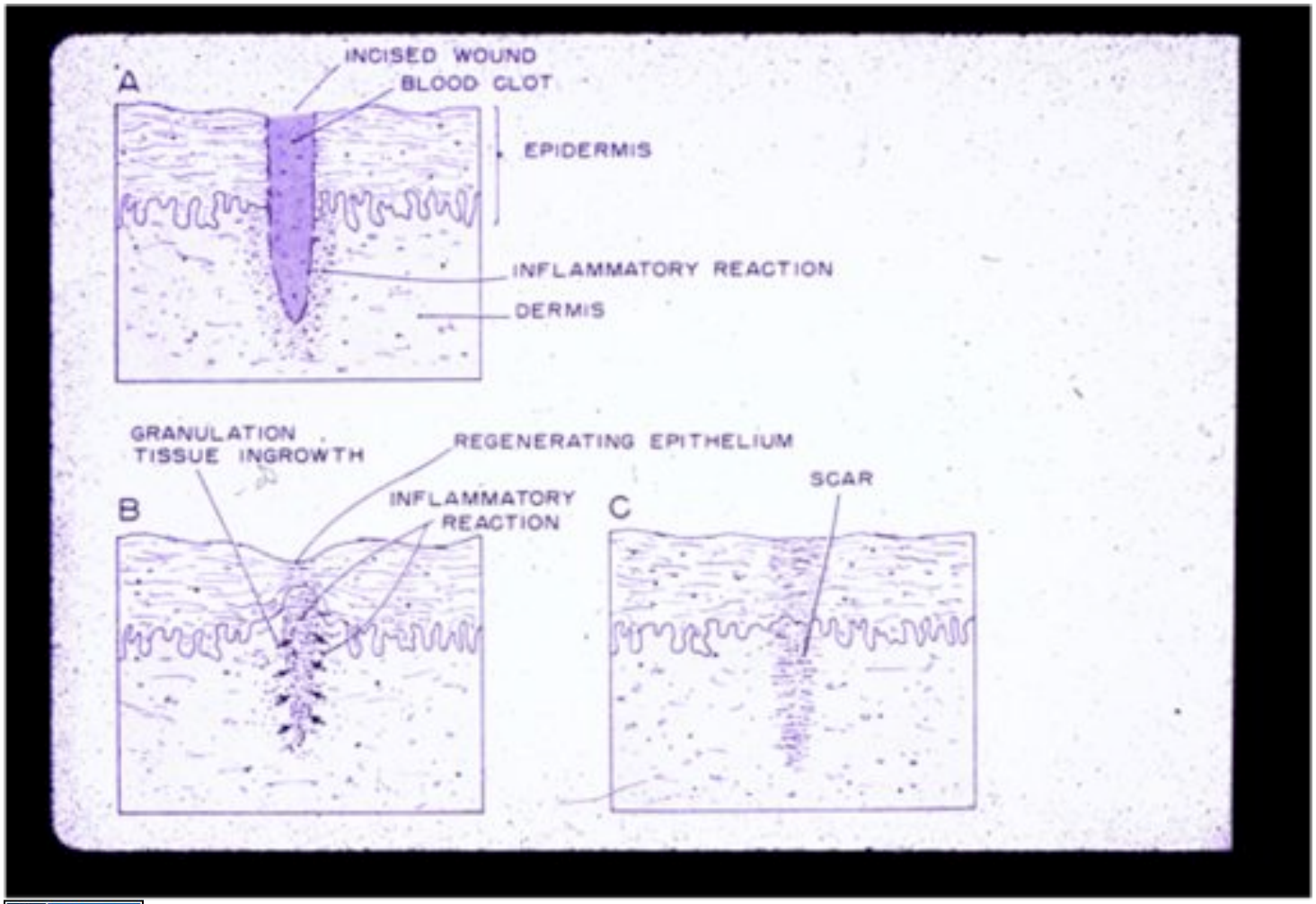
- Healing by primary or first intention- wound edges in apposition at the start of healing.

- Healing by secondary or second intention- wound edges apart, wound open.

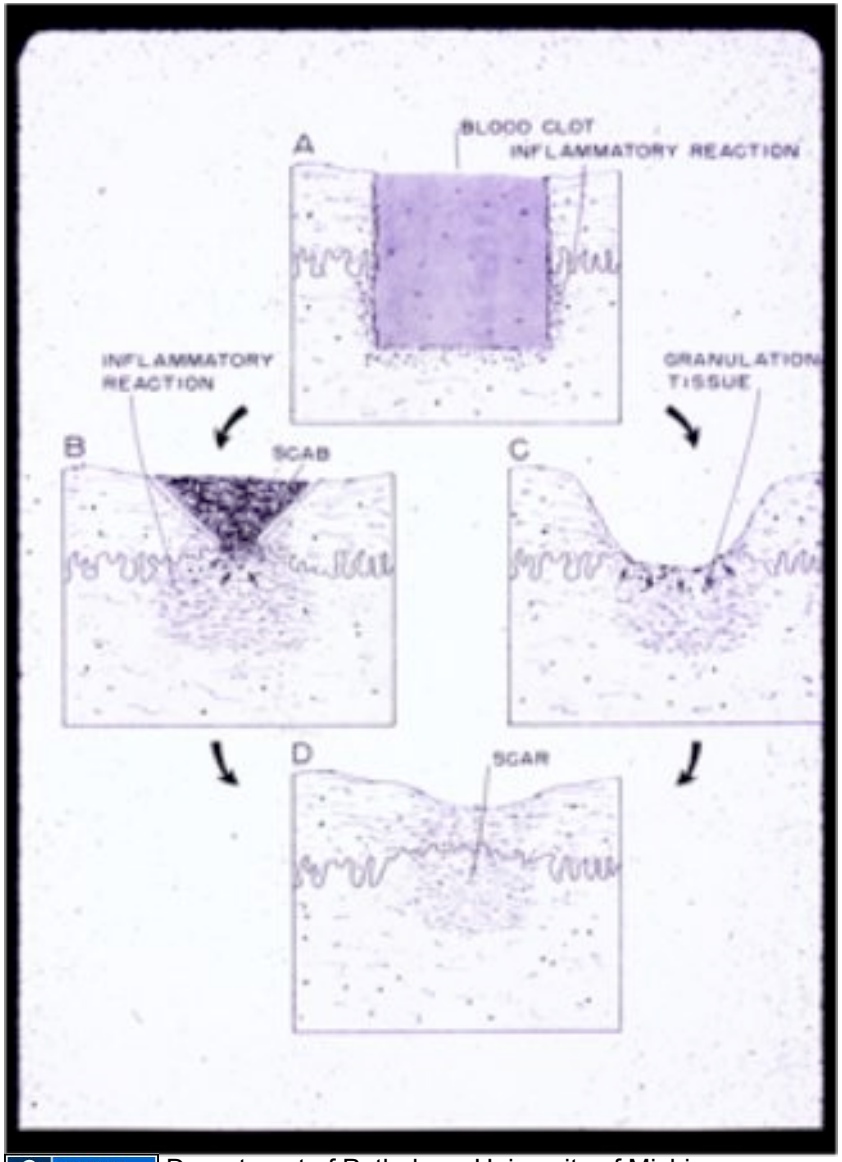
PHASES OF WOUND HEALING

- Inflammation
- Organization and Regeneration
- Deposition of ECM
- Remodeling

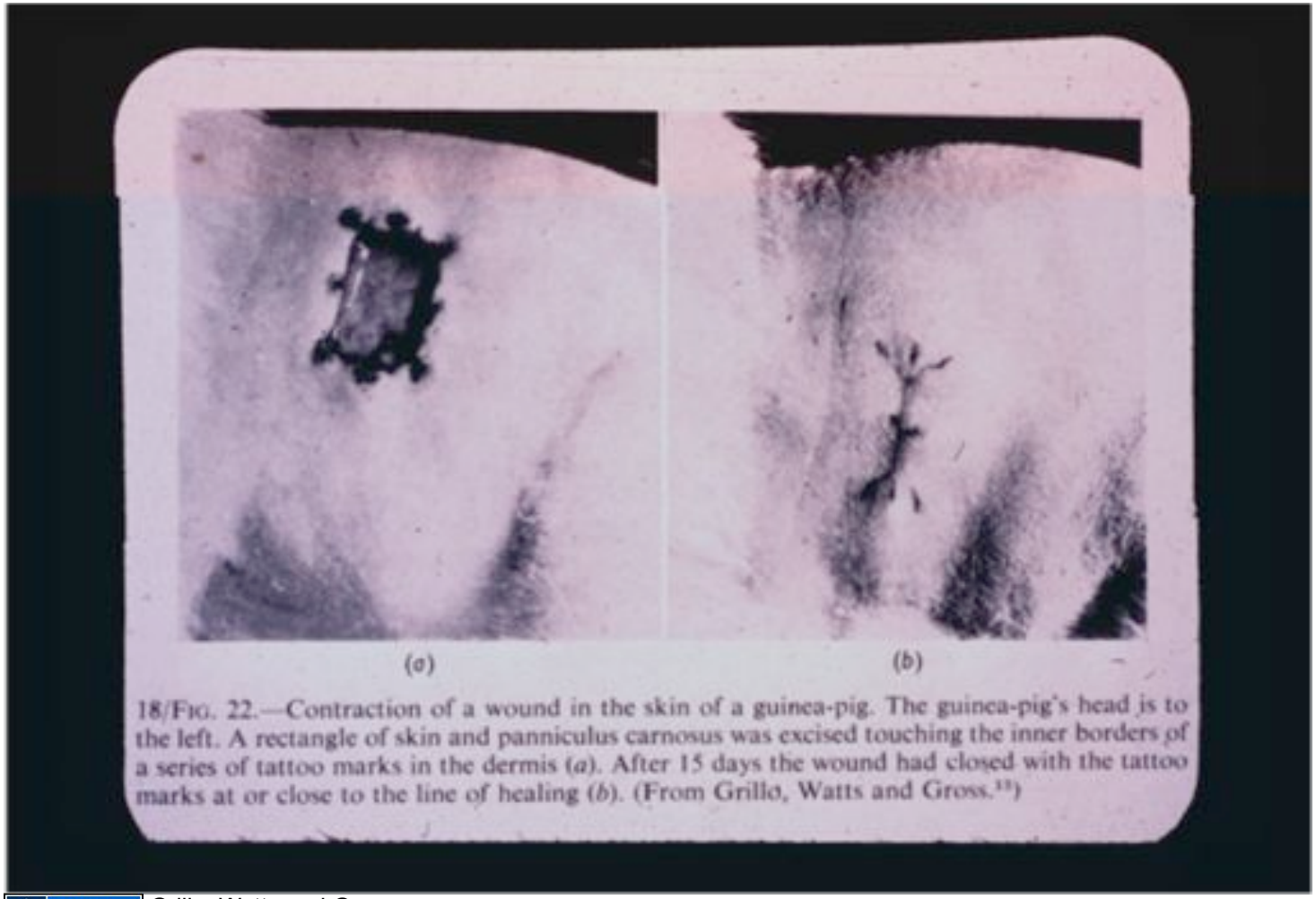
HEALING BY PRIMARY INTENTION



HEALING BY SECONDARY INTENTION



WOUND CONTRACTION



18/FIG. 22.—Contraction of a wound in the skin of a guinea-pig. The guinea-pig's head is to the left. A rectangle of skin and panniculus carnosus was excised touching the inner borders of a series of tattoo marks in the dermis (*a*). After 15 days the wound had closed with the tattoo marks at or close to the line of healing (*b*). (From Grillo, Watts and Gross.[33])

 Grillo, Watts and Gross

Complications of Wound Healing

- Deficient scar – dehiscence, hernia
- Excessive scar – hypertrophic scar, keloid
- Excessive granulation tissue – “proud flesh”, adhesions
- Contracture
- Traumatic neuroma

KELOID

ADHESIONS

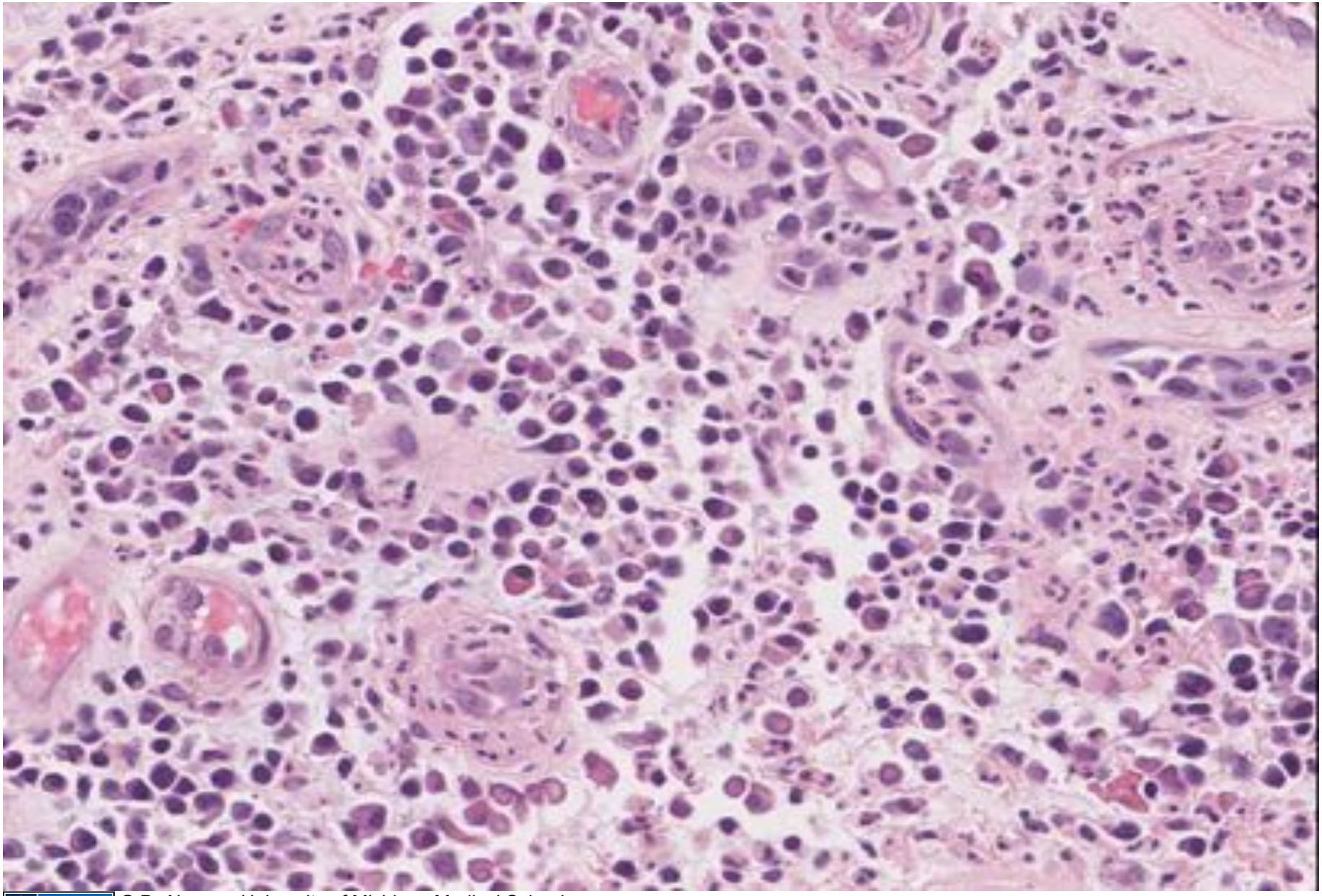
CHRONIC INFLAMMATION

Inflammation sufficiently prolonged that evidence of repair is seen at the same time as evidence of tissue injury and continuing, active inflammation

CAUSES OF CHRONIC INFLAMMATION

- Prolonged or repetitive action of toxic agents
- Persistent infection
- Autoimmunity

CHRONIC INFLAMMATION



ACUTE PHASE RESPONSE

- Leukocytosis
- Fever
- Synthesis of acute phase proteins
- Miscellaneous systemic effects

What we want you to know and understand

- The 5 cardinal signs of inflammation – their mechanisms
- Mechanisms of the vascular response and the cellular response and how they relate to one another
- The cells participating in inflammatory and reparative responses, and their roles
- Exudates – various types, why they form, and their fate. Granulomatous inflammation
- Organization and scarring
- Wound healing – mechanisms, factors affecting healing, complications

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