

H&E — INFLAMMATION, WOUND HEALING & REPAIR

INFLAMMATION

Definition

Inflammation is the protective vascular and cellular response of living tissue to injury.

Purpose:

- Eliminate cause
 - Remove necrotic tissue
 - Initiate repair
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TYPES OF INFLAMMATION

1] Acute Inflammation

Short duration (minutes to days)

Causes

- Infection
 - Trauma
 - Burns
 - Chemical injury
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Pathogenesis (Steps)

1] Vascular Changes

- Vasodilation → redness (rubor), heat (calor)
 - Increased vascular permeability → edema (tumor)
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2] Cellular Events

- Margination
- Rolling

- Adhesion
- Diapedesis
- Chemotaxis

Neutrophils dominate.

Cardinal Signs (Celsus)

- Rubor (redness)
 - Calor (heat)
 - Tumor (swelling)
 - Dolor (pain)
 - Functio laesa (loss of function)
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Outcomes of Acute Inflammation

- Complete resolution
- Abscess formation
- Chronic inflammation
- Healing by fibrosis

② Chronic Inflammation

Long duration (weeks to years)

Cells involved:

- Macrophages
- Lymphocytes
- Plasma cells

Types:

- ◆ Non-specific chronic inflammation

Fibrosis + tissue destruction

- ◆ Granulomatous inflammation

Example:

- Tuberculosis
- Foreign body reaction

Granuloma components:

- Epithelioid cells
 - Giant cells
 - Lymphocytes
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 Definition

Replacement of damaged tissue by:

- Regeneration
 - Fibrosis (scar formation)
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Regeneration

Occurs in:

- Labile tissues (skin, mucosa)

- Stable tissues (liver)

Requires intact basement membrane.

2] Fibrosis (Scar Formation)

Occurs when:

- Severe damage
- Basement membrane destroyed

Involves:

- Fibroblast proliferation
 - Collagen deposition
 - Angiogenesis
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WOUND HEALING

Definition

Restoration of tissue continuity after injury.

 TYPES OF WOUND HEALING

Primary Intention

Clean surgical wound.

Features:

- Minimal tissue loss
- Edges approximated
- Minimal scar

Timeline:

Time	Event
Day 1	Neutrophils

Day 2-3	Macrophages
Day 3-5	Granulation tissue
Week 1	Collagen deposition
1 month	Scar formation

2 Secondary Intention

Large, infected wound.

Features:

- Large tissue loss
 - More inflammation
 - More granulation tissue
 - More scarring
 - Wound contraction (myofibroblasts)
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PHASES OF WOUND HEALING

1 Hemostasis Phase

- Platelet plug
 - Fibrin clot
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2 Inflammatory Phase

- Neutrophils
 - Macrophages
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3 Proliferative Phase

- Fibroblasts
- Collagen
- Angiogenesis
- Granulation tissue

4 Remodeling Phase

- Collagen type III → type I
- Scar strengthens

Maximum strength = 80% of normal tissue.

Examiner favorite point.

FACTORS AFFECTING WOUND HEALING

◆ Local Factors

- Infection (most important)
 - Poor blood supply
 - Foreign body
 - Hematoma
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◆ Systemic Factors

- Diabetes
 - Malnutrition
 - Anemia
 - Steroids
 - Old age
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COMPLICATIONS OF WOUND HEALING

1] Wound Dehiscence

Burst abdomen (usually day 5-7)

2] Hypertrophic Scar

Excess collagen but confined to wound.

3) Keloid

Extends beyond wound margin.

Common in:

- Earlobes
 - Sternum
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4) Sinus

Blind tract.

5) Fistula

Abnormal communication between two epithelial surfaces.

VIVA QUESTIONS

- What is granulation tissue?

- Difference between keloid and hypertrophic scar?
 - Why diabetics have poor wound healing?
 - Why infection delays healing?
 - When does wound gain maximum strength?
 - What is proud flesh?
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-> The End <-