Chronic Inflammation

Prolonged tissue injury causes persistent or chronic inflammation.

◆ Chronic Inflammation may develop:

1. Progressive acute inflammation.
2. Primary chronic inflammation.

Primary chronic inflammation produced by agent

◆ Dust like carbon, silica, asbestosis
◆ Microorganisms like virus, bacteria, fungus, and also large parasite.
◆ Hypersensitivity.
◆ Unknown causes.

Characteristic features of chronic inflammation are:

1. Infiltration by mononuclear cells "macrophage, lymphocytes and plasma cells"

2. Proliferation of fibroblasts rather than exudates.

3. The risk of scaring and deformity developing is usually considerably greater than in acute inflammation.

Effect of chronic Inflammation

Beneficial effects:

1. Proliferation of new blood vessels make the emigration of leukocytes is possible.
2. Fibrous tissue forms barrier to bacteria and toxin.

Side effect

◆ Is usually accompanied by loss paranchymal cells (tissue destruction).

Types of inflammatory cells:

1. Polymorphonuclear leucocytes (PMN)

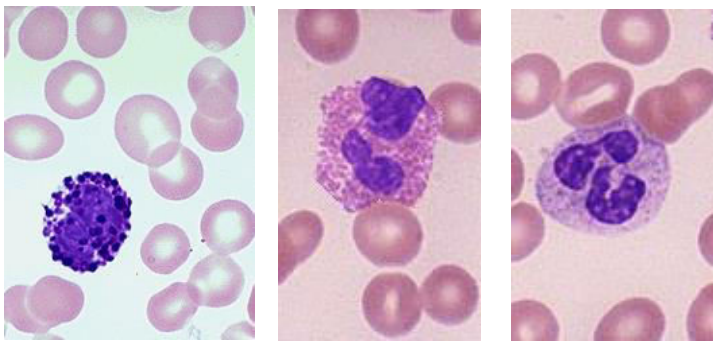
- *Neutrophil polymorphs (microphages).*
- *Eosinophil polymorphs*
- *Basophils*

2. Lymphoid cells:

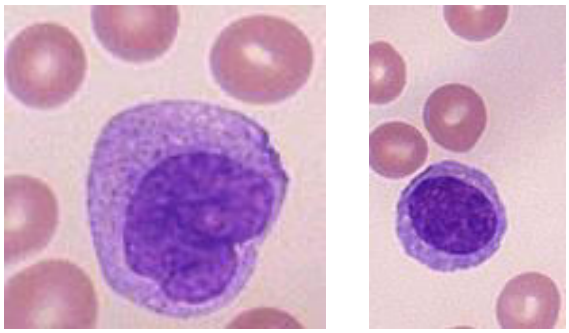
- *Lymphocytes*
- *Plasma cell:* This cell is derived from lymphocyte and has small round nucleus in which granules of chromatin are regularly spaced around the periphery giving a (cart-wheel) or (clock face).

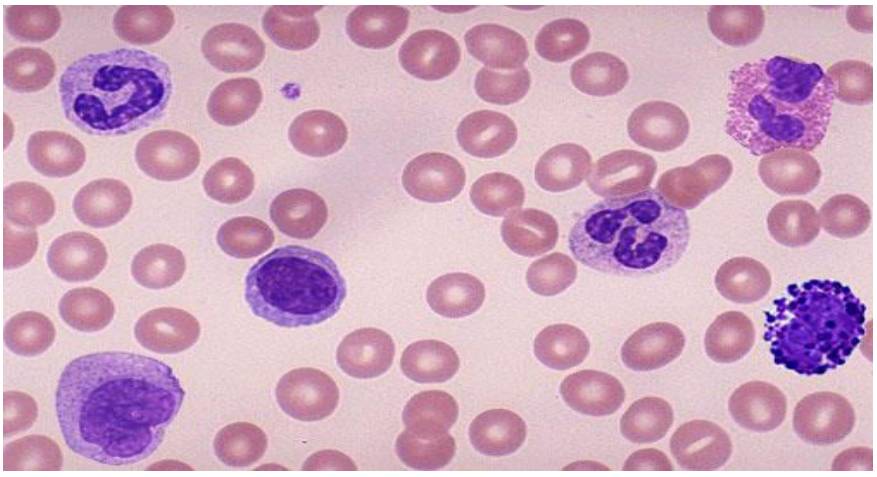
Inflammatory Cells

Polymorphonuclear leukocytes



Lymphoid and Macrophages

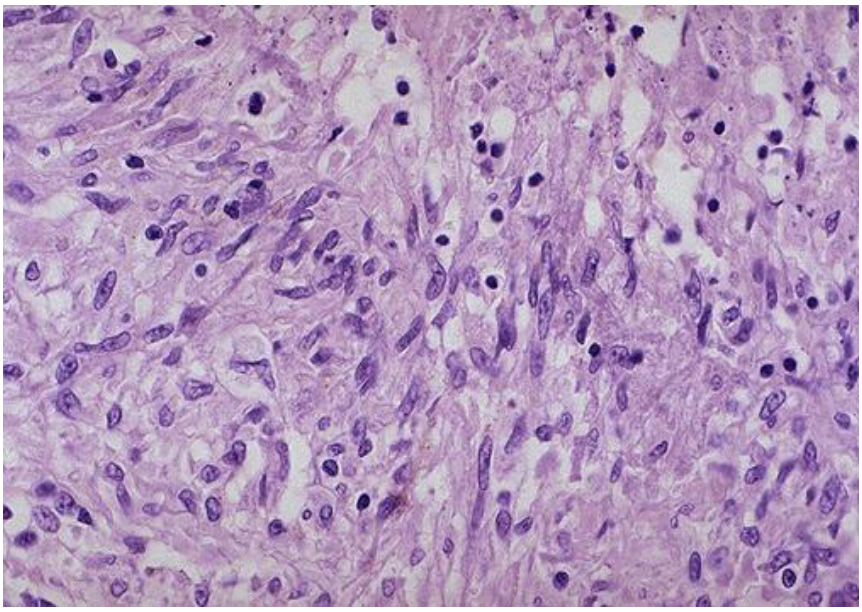




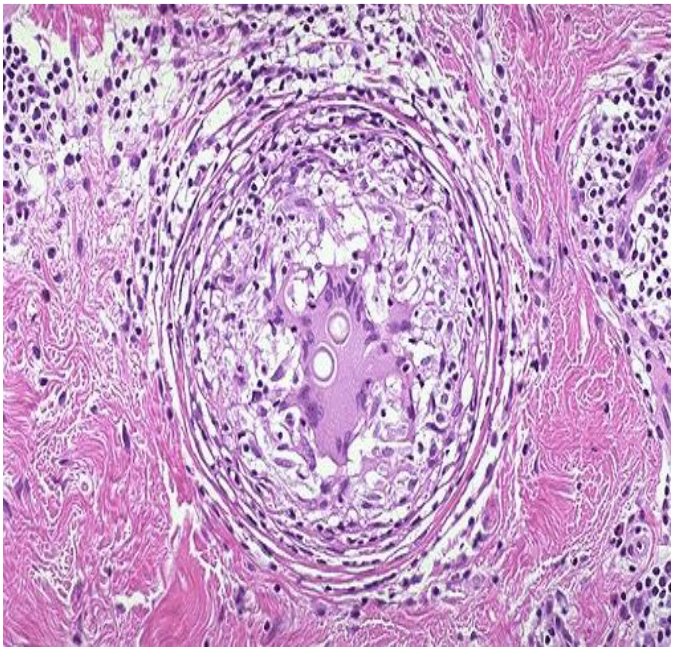
Macrophages

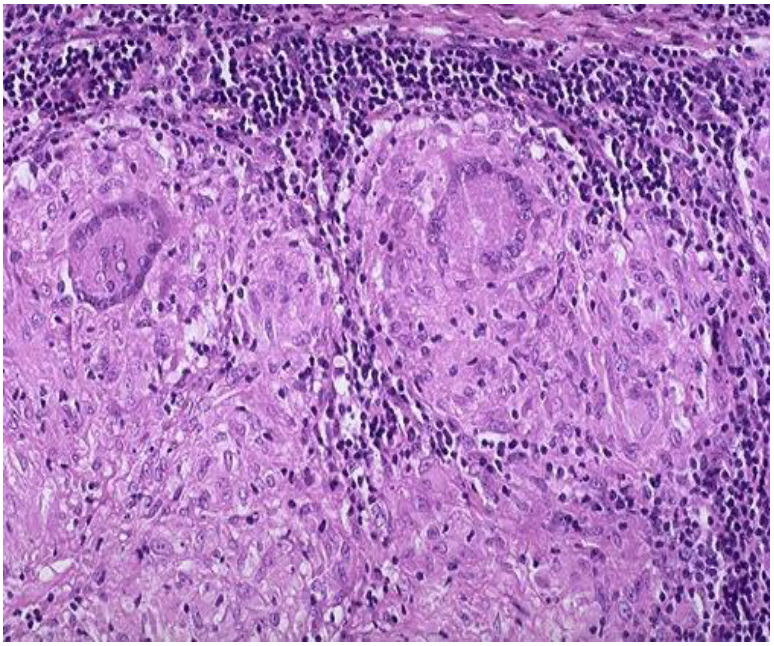
- Special forms of Inflammatory Macrophages:
- *Epithelioid Cells*
- *Giant Cells*

These are epithelioid cells they get their name from the fact they have similar shape to squamous epithelial cells. Their nuclei tend to be long .



Giant cells are a committee of epithelioid or macrophage. Seen here are two giant cells in which the nuclei are lined up around the periphery of the cell.





Repair or Healing

Repair:
Means restitution of injured part of tissue to nearly complete replication of its former structure.

◆ Repair is one of the fundamental biological process occurs with animals, plants and without it there is no animal or plant survive.

◆ Tissue repair either by:
regeneration or ***organization.***

Regeneration

◆ Means replacement of tissue cells by proliferation of similar kind of cells.

◆ Somatic cells are divided into three types according to their ability to regeneration:

◆ Labile cells: those cells under normal condition continue to divide and multiply throughout the life.

◆ Stable cells: Normally cease replication when growth ceases but it can retain ability for some regeneration after damage.

Permanent cell

◆ These cells have no ability to regeneration when damage.

◆ Organization: It is a process of conversion of inflammatory debris into granulation tissue and finally to the fibrous tissue.

Healing of Skin Wounds

Healing by first intention "Primary Union"

Occurs:

- Clean wounds
- Without loss tissues
- The edges of the wound are closed by sutures.

Characterized by:

- Only minimal amount of granulation tissue is formed.
- Take 2-3 weeks for healing.

Healing by second intention "Secondary Union"

Occurs:

- Open wounds
- Lost of tissue
- Infected closed wound

Characterized by:

- Formation of large amount of granulation tissue
- Taking longer time to heal.

Phases of wound healing

- Inflammatory Phase
- Proliferative Phase
- Maturational Phase

Inflammatory phase

- This phase begins at the time of injury. It involves:

- Constriction of injured blood vessels and initiation of blood clotting "blood clot serves as a protect scab"

- After a brief period of constriction, these same vessels dilate and capillaries increase their permeability and produce exudate.

Proliferative phase

- Begins within 2-3 days of injury and may last as long as three weeks in wounds healing by primary union this phase involves:

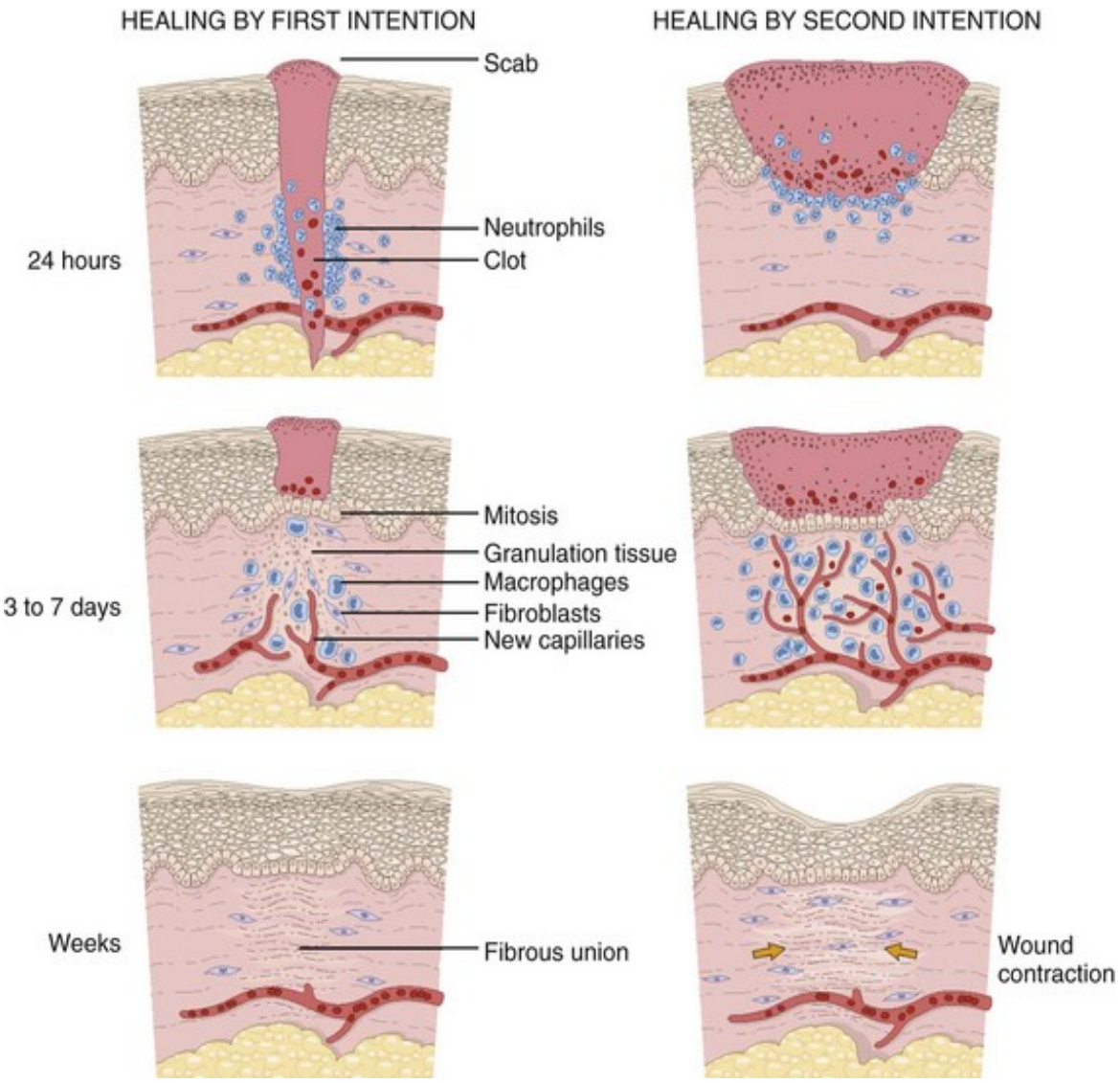
- Epithelial cells at the margin of the wound begin to regenerate and move toward the center of the wound, forming a new surface layer that destroyed by the injury.

- Proliferation of fibroblasts and newly blood vessels are formed to form a specialized type of soft pink granular tissue called granulation tissue.

- Collagen formed by fibroblast.

Maturational Phase

- Maturational of granulation tissue to form scar tissue.



Factors impair wound healing

◆ Systemic

1. Mal nutrition e.g. protein deficiency, vitamin C deficiency.
2. Poor blood supply
3. Metabolic disease like diabetes mellitus.
4. Hormones like corticosteroids.