

Рана (Vulnus)



Класификација ране по дубини

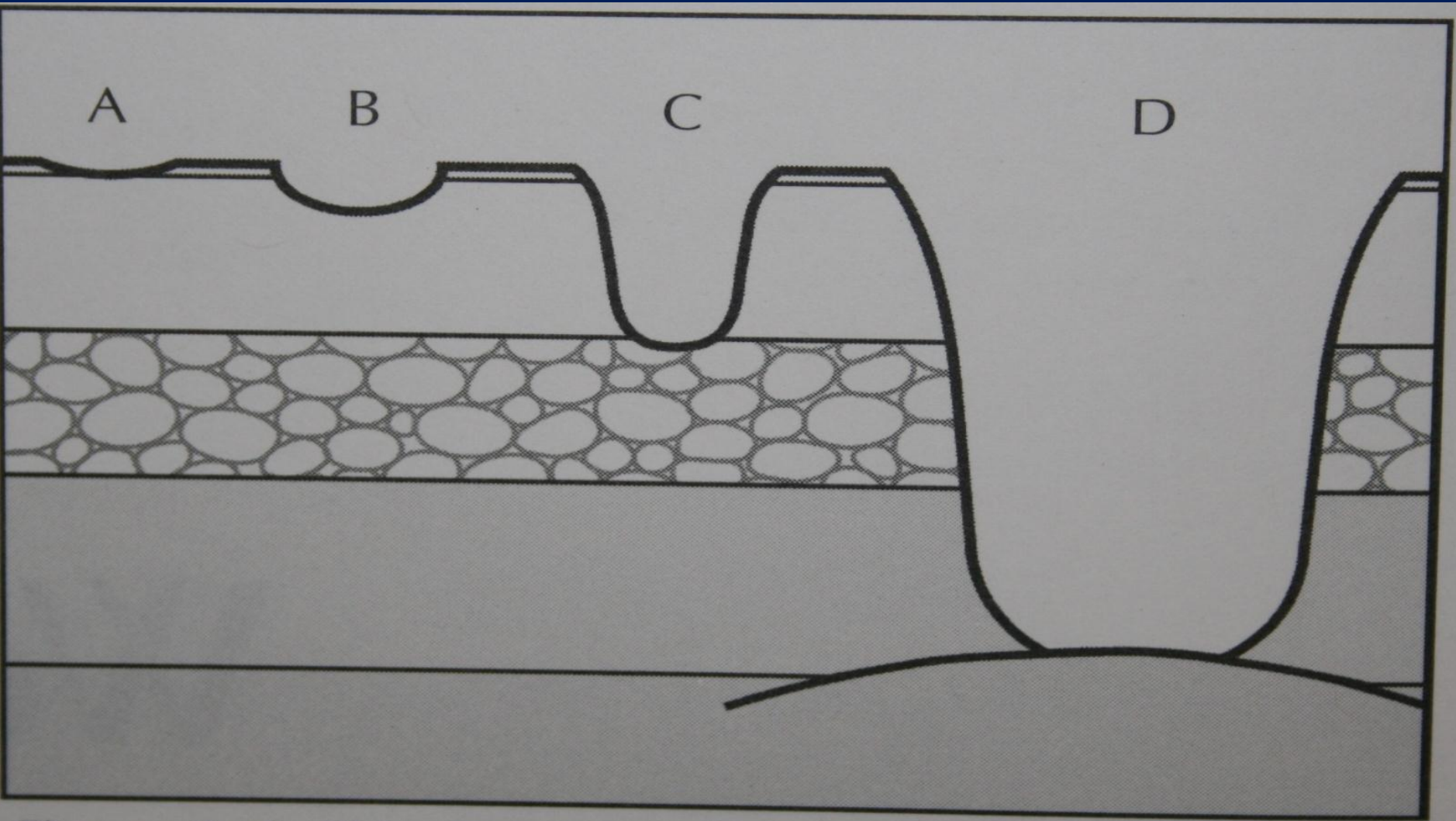
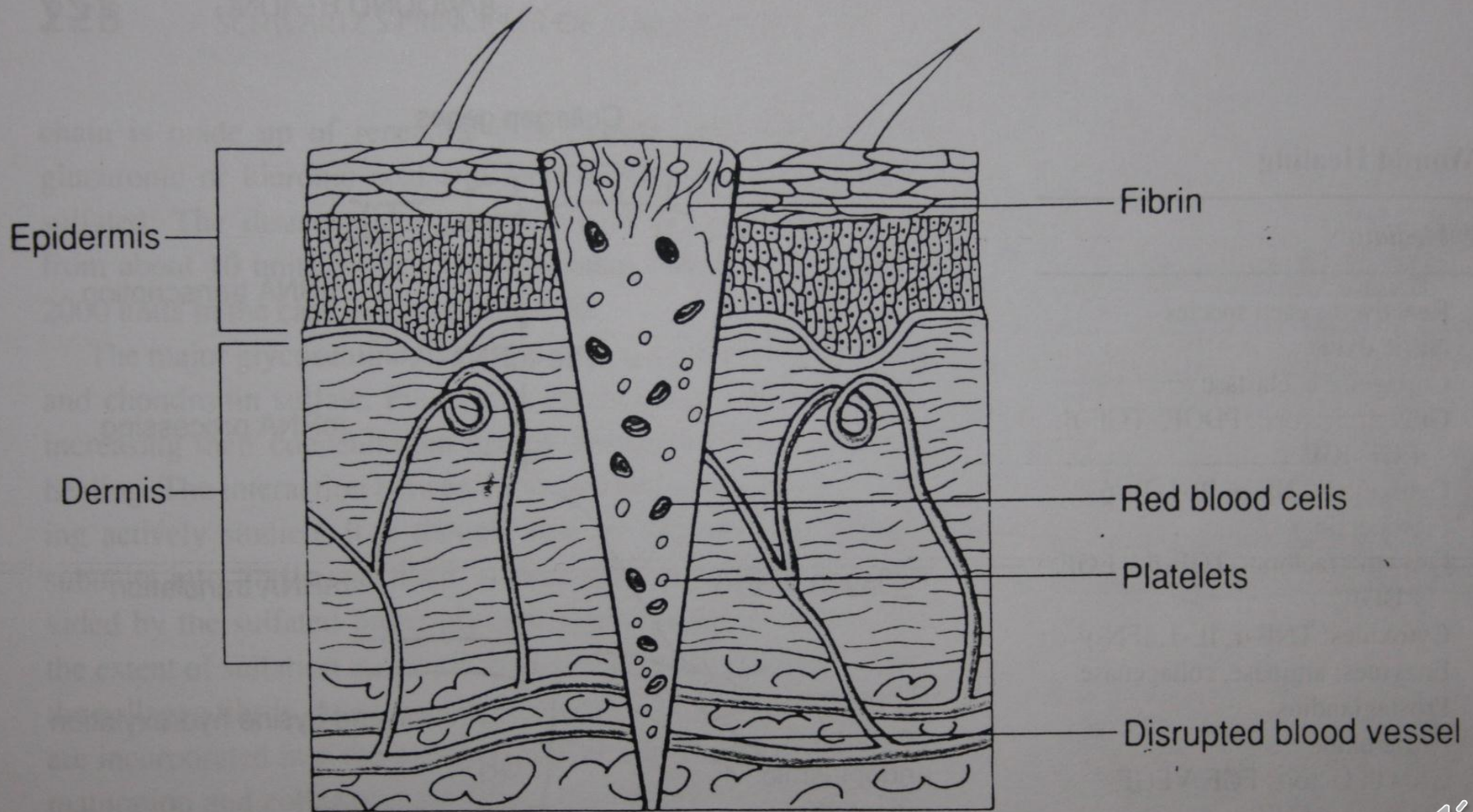


Figure 2-2. Skin structures involved in different depths of wounds.



Зарастање ране

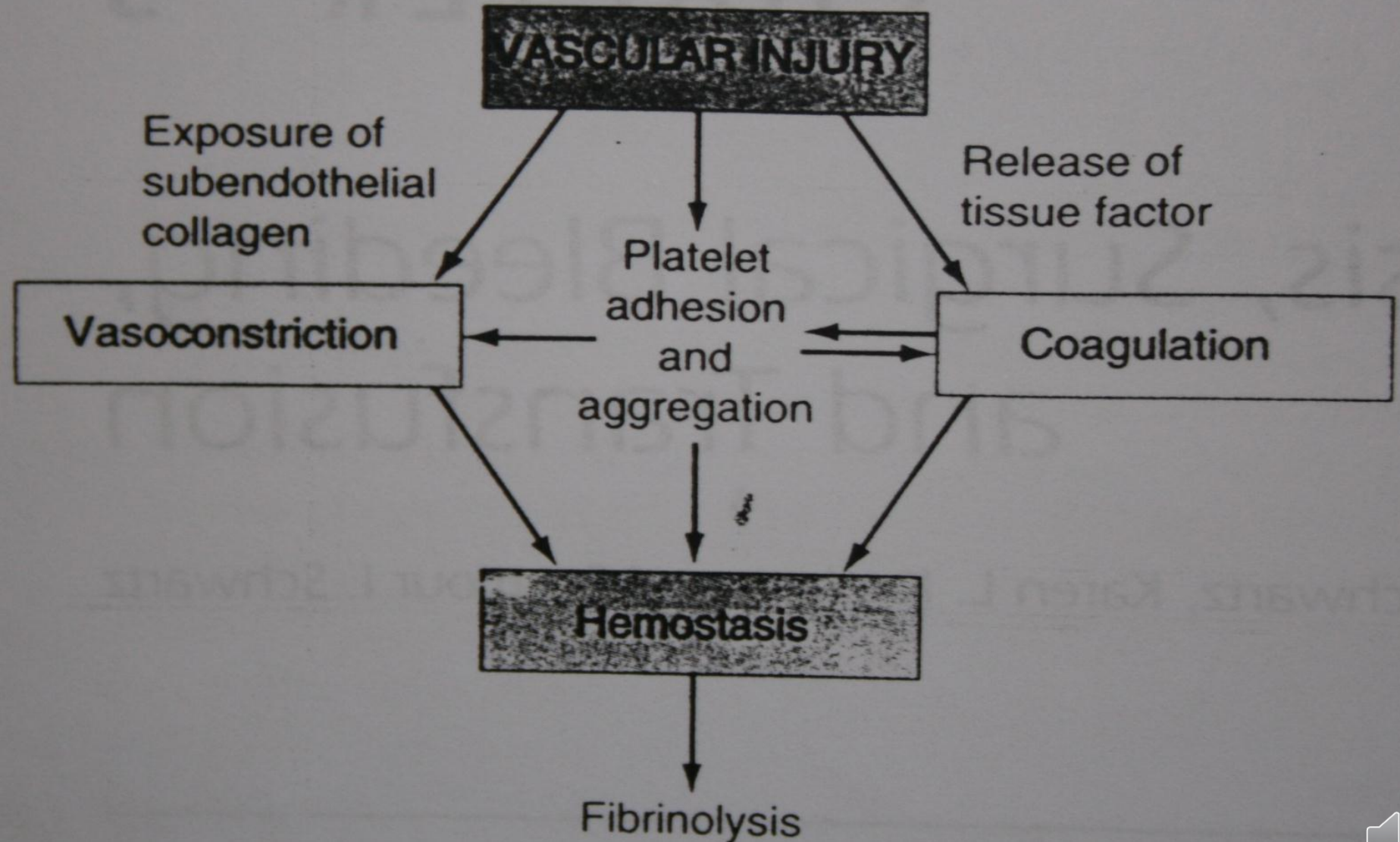
Фаза хемостазе и инфламације



A

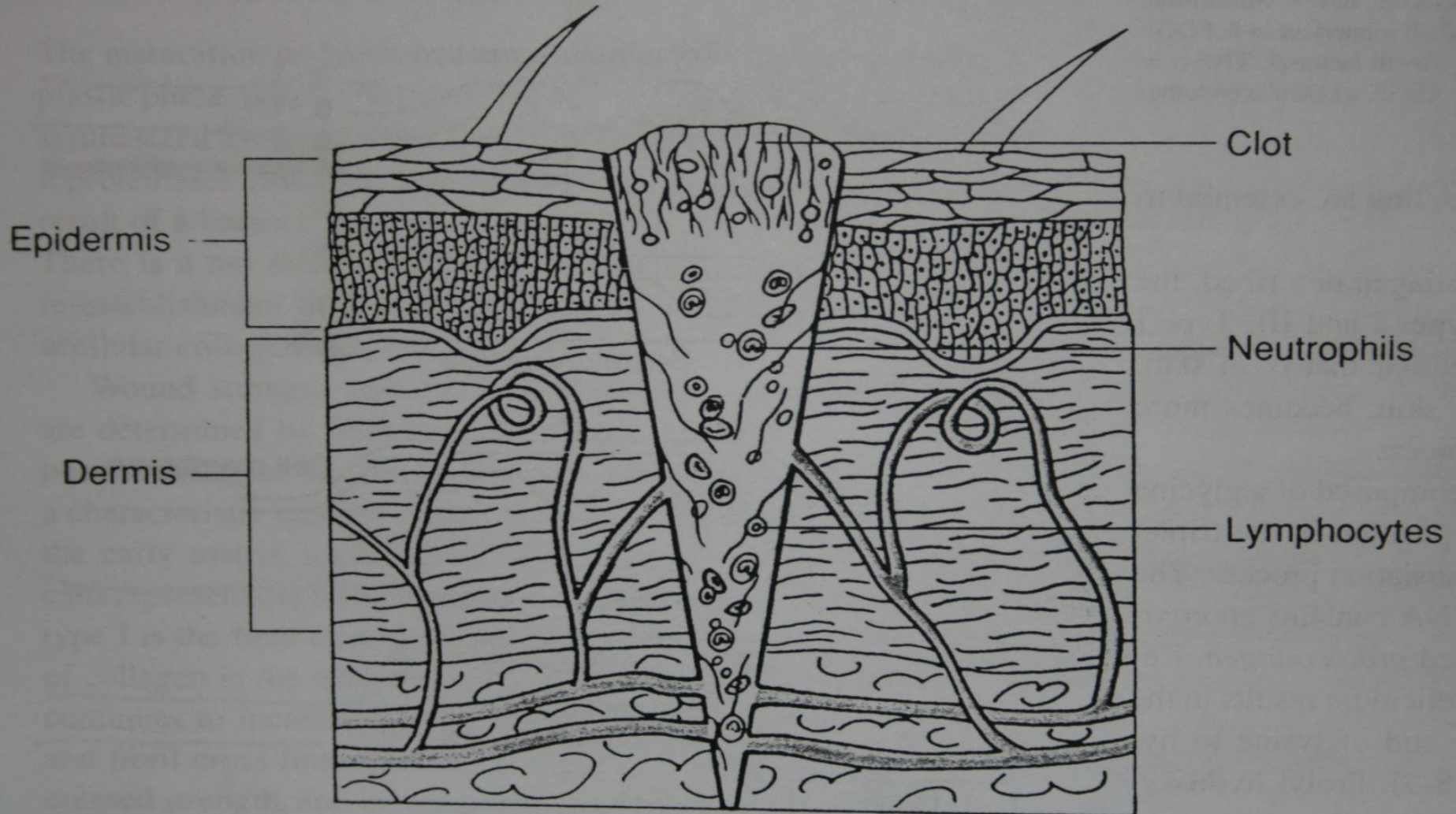


Процеси који започињу васкуларном повредом



Зарастање ране

Фаза хемостазе и инфламације

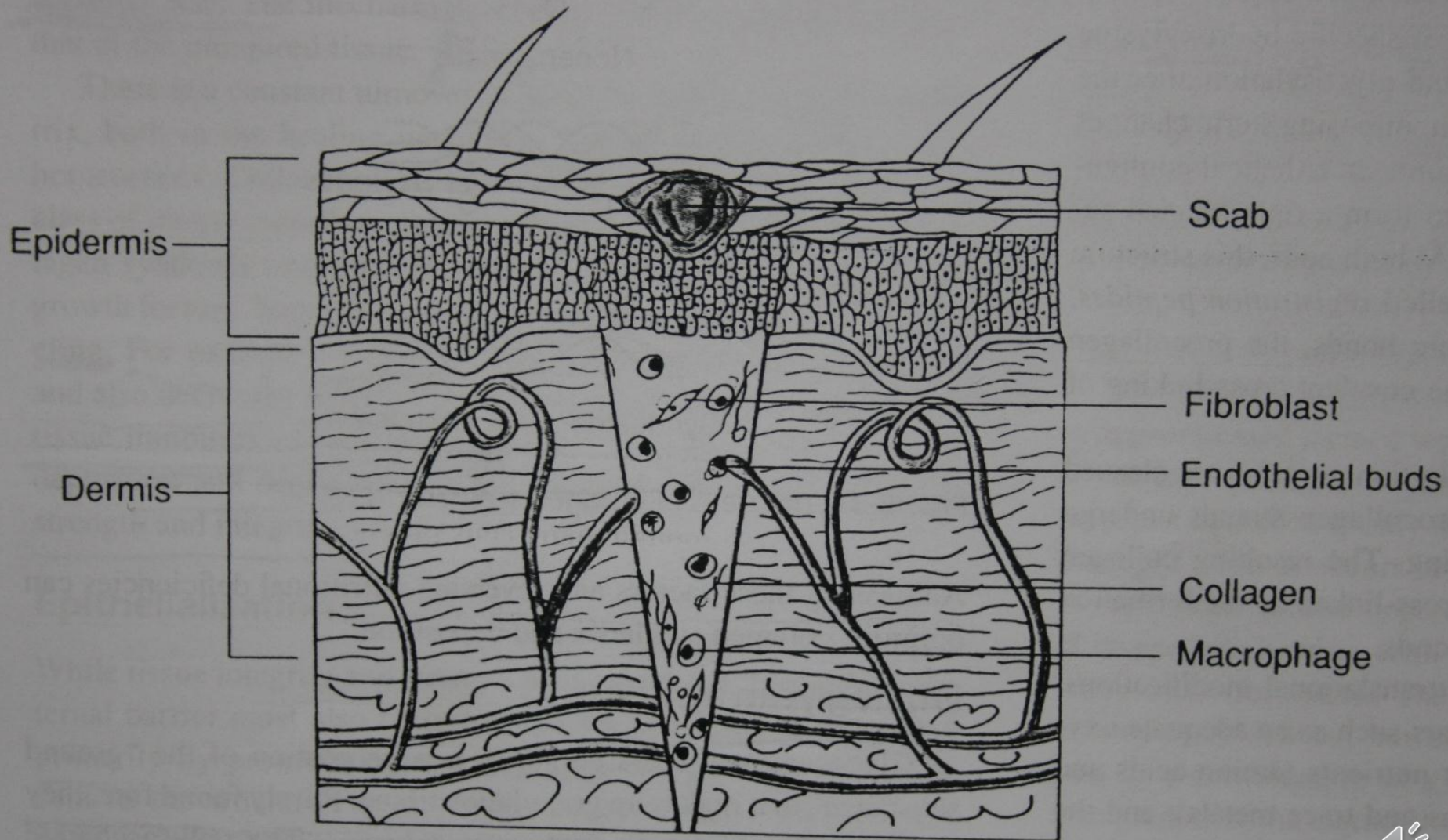


B



Зарастање ране

Фаза пролиферације



АКТИВНОСТИ макрофага ТОКОМ зарастања ране

Table 8-1

Macrophage Activities During Wound Healing

<i>Activity</i>	<i>Mediators</i>
Phagocytosis	Reactive oxygen species Nitric oxide
Débridement	Collagenase, elastase
Cell recruitment and activation	Growth factors: PDGF, TGF- β , EGF, IGF Cytokines: TNF- α , IL-1, IL-6 Fibronectin
Matrix synthesis	Growth factors: TGF- β , EGF, PDGF Cytokines: TNF- α , IL-1, IFN- γ Enzymes: arginase, collagenase Prostaglandins Nitric oxide
Angiogenesis	Growth factors: FGF, VEGF Cytokines: TNF- α Nitric oxide



Фактори раста који учествују у зарастању ране

Table 8-2

Growth Factors Participating in Wound Healing

<i>Growth Factor</i>	<i>Wound Cell Origin</i>	<i>Cellular and Biological Effects</i>
Platelet-derived growth factor (PDGF)	Platelets, macrophages, monocytes, smooth muscle cells, endothelial cells	Chemotaxis: fibroblasts, smooth muscle, monocytes, neutrophils Mitogenesis: fibroblasts, smooth muscle cells Stimulation of angiogenesis Stimulation of collagen synthesis
Fibroblast growth factor (FGF)	Fibroblasts, endothelial cells, smooth muscle cells, chondrocytes	Stimulation of angiogenesis (by stimulation of endothelial cell proliferation and migration) Mitogenesis: mesoderm and neuroectoderm Stimulates fibroblasts, keratinocytes, chondrocytes, myoblasts

Фактори раста који учествују у зарастању ране

Keratinocyte growth factor (KGF)	Keratinocytes, fibroblasts	Significant homology with FGF; stimulates keratinocytes
Epidermal growth factor (EGF)	Platelets, macrophages, monocytes (also identified in salivary glands, duodenal glands, kidney, and lacrimal glands)	Stimulates proliferation and migration of all epithelial cell types
Transforming growth factor- α (TGF- α)	Keratinocytes, platelets, macrophages	Homology with EGF; binds to EGF receptor Mitogenic and chemotactic for epidermal and endothelial cells
Transforming growth factor- β (TGF- β) (3 isoforms: β_1 , β_2 , β_3)	Platelets, T lymphocytes, macrophages, monocytes, neutrophils	Stimulates angiogenesis TGF- β_1 stimulates wound matrix production (fibronectin, collagen glycosaminoglycans); regulation of inflammation TGF- β_3 inhibits scar formation
Insulin-like growth factors (IGF-1, IGF-2)	Platelets (IGF-1 in high concentrations in liver; IGF-2 in high concentrations in fetal growth)	Likely the effector of growth hormone action Promotes protein/extracellular matrix synthesis Increase membrane glucose transport



Фактори раста који учествују у зарастању ране

Vascular endothelial growth
factor (VEGF)

Macrophages, fibroblasts,
keratinocytes

Similar to PDGF

Mitogen for endothelial cells (not
fibroblasts)

Stimulates angiogenesis

Granulocyte-macrophage
colony-stimulating factor
(GM-CSF)

Macrophage/monocytes,
endothelial cells, fibroblasts

Stimulates macrophage
differentiation/proliferation



Фактори који утичу на зарастање ране

Factors Affecting Wound Healing

Systemic

Age

Nutrition

Trauma

Metabolic diseases

Immunosuppression

Connective tissue disorders

Smoking

Local

Mechanical injury

Infection

Edema

Ischemia/necrotic tissue

Topical agents

Ionizing radiation

Low oxygen tension

Foreign bodies



Хипертрофични ожиљак



Келоид



КЕЛОИД. Phot. X.



Типови зарастања ране

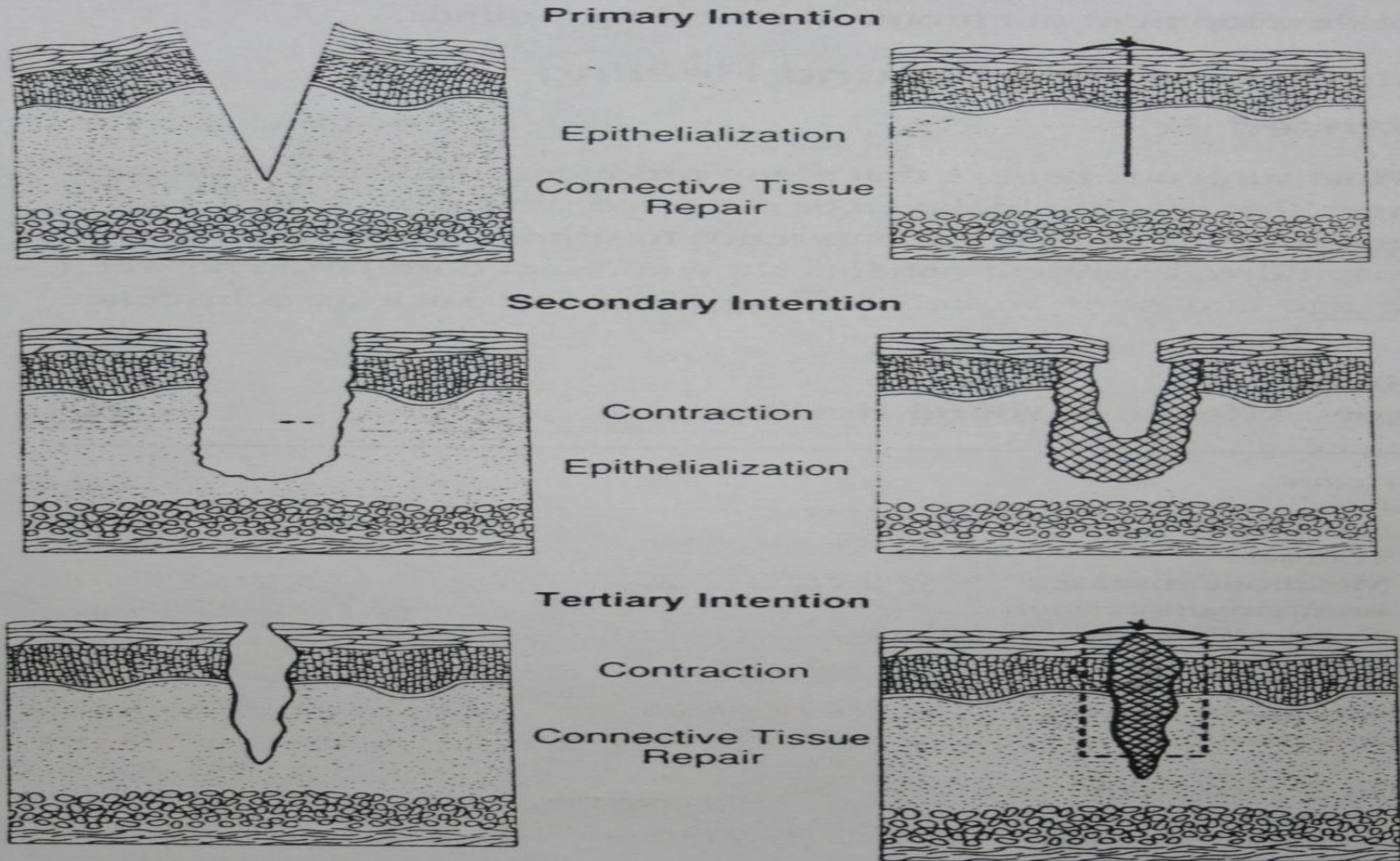
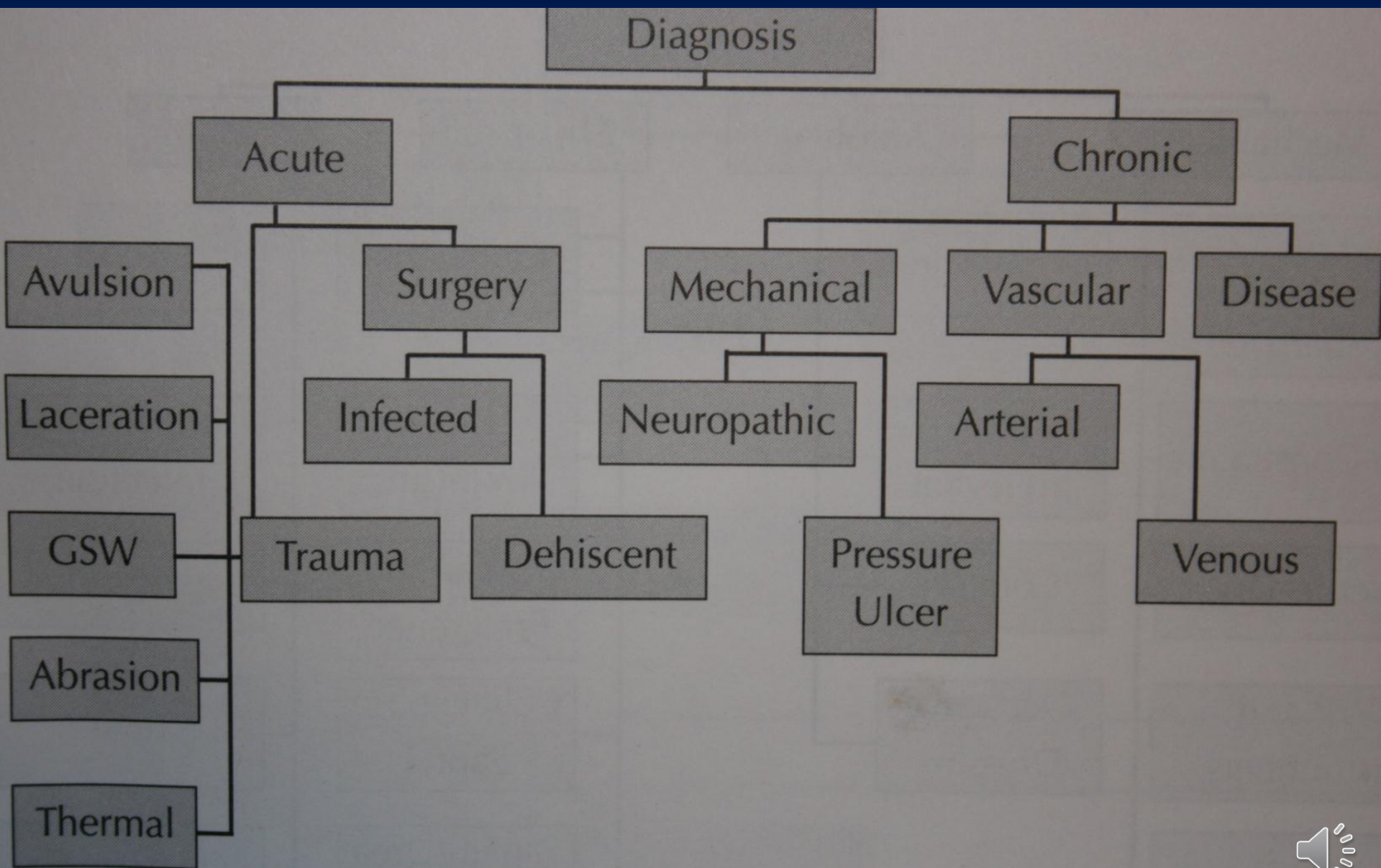


FIG. 8-6. Different clinical approaches to the closure and healing of acute wounds.



Класификација рана



Абразивна рана

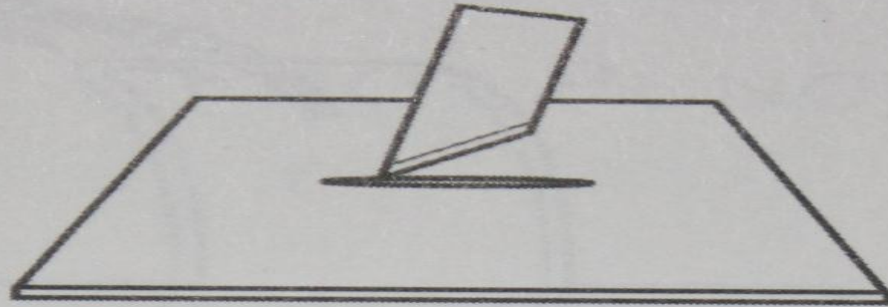
excoriatio



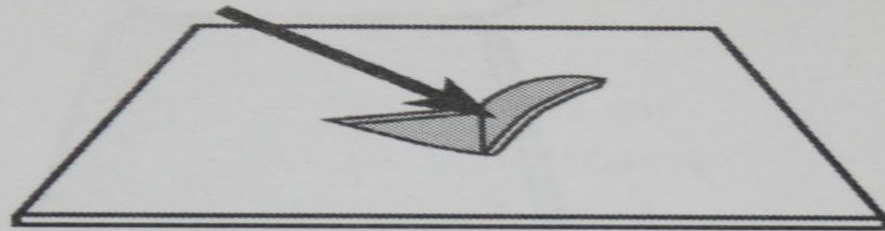
Раздерина

vulnus lacerum

shearing



tension



compression

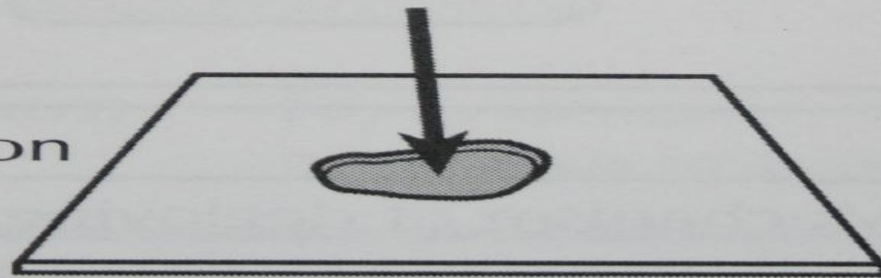


Figure 7-2. Mechanisms of lacerations.



Авулзија

vulnus avulsivum

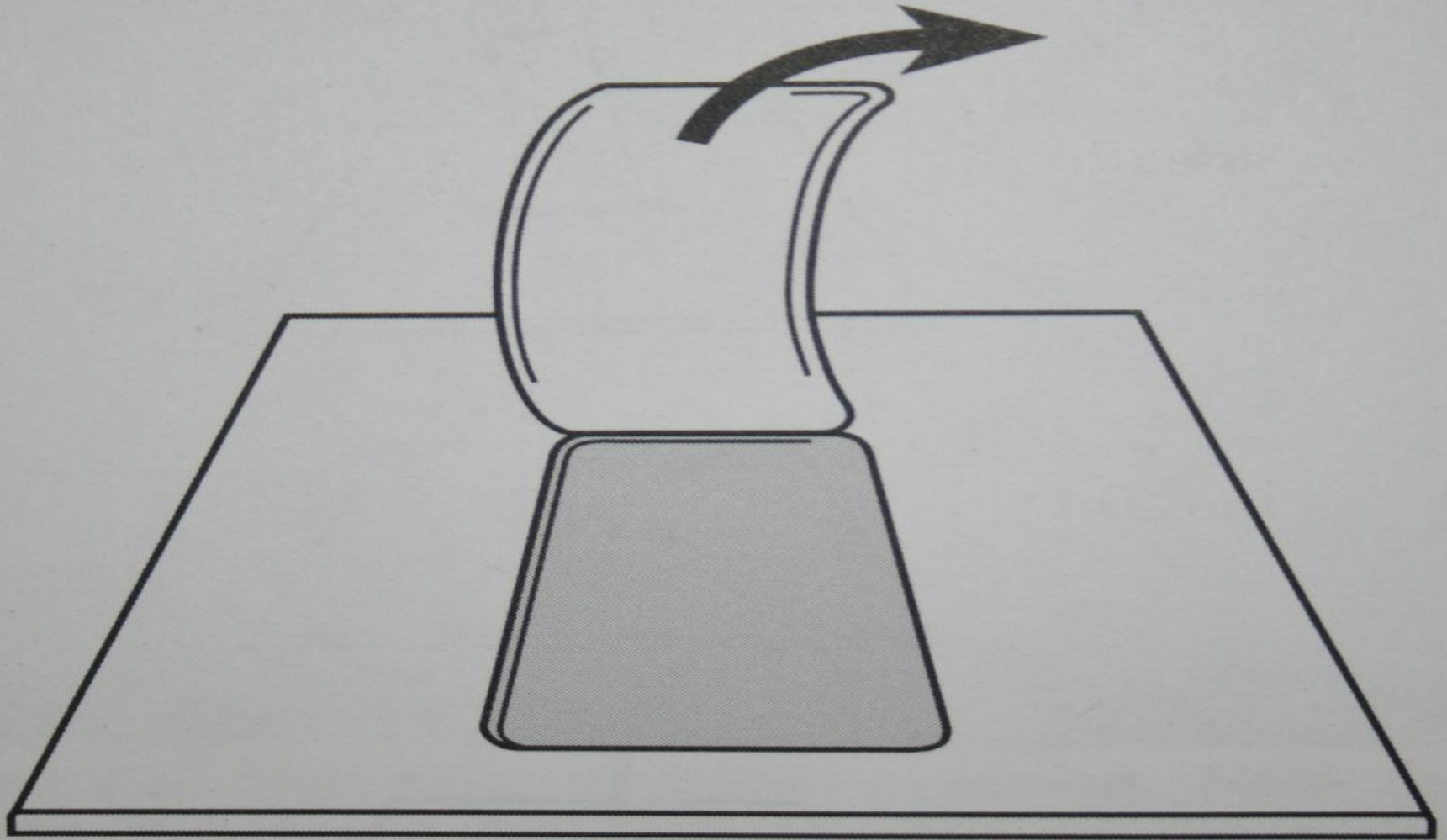


Figure 7-4. Mechanism of degloving (avulsion).




Убодна рана

vulnus punctum

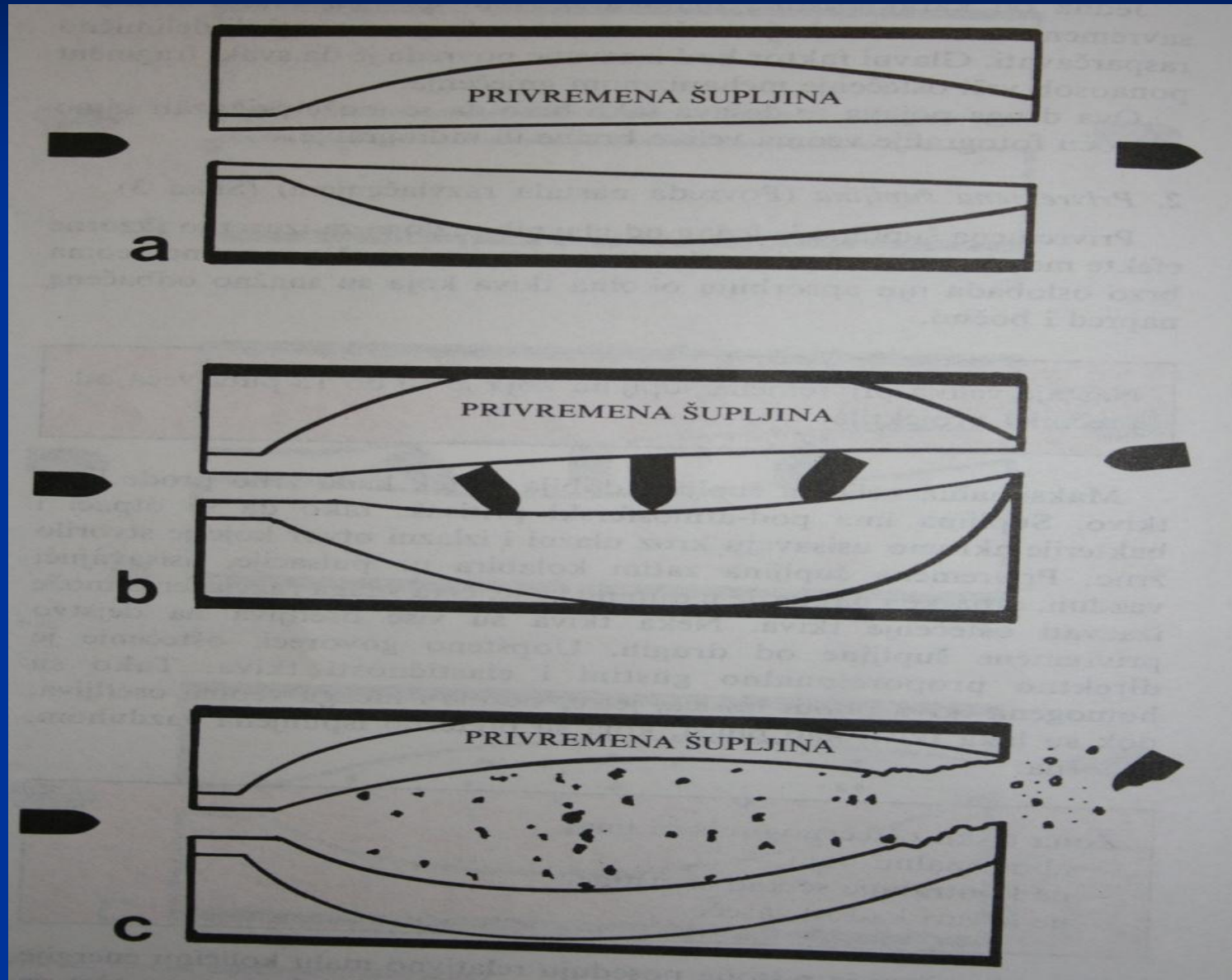
Table 7-1

FOOT PUNCTURE WOUND SCORING SYSTEM

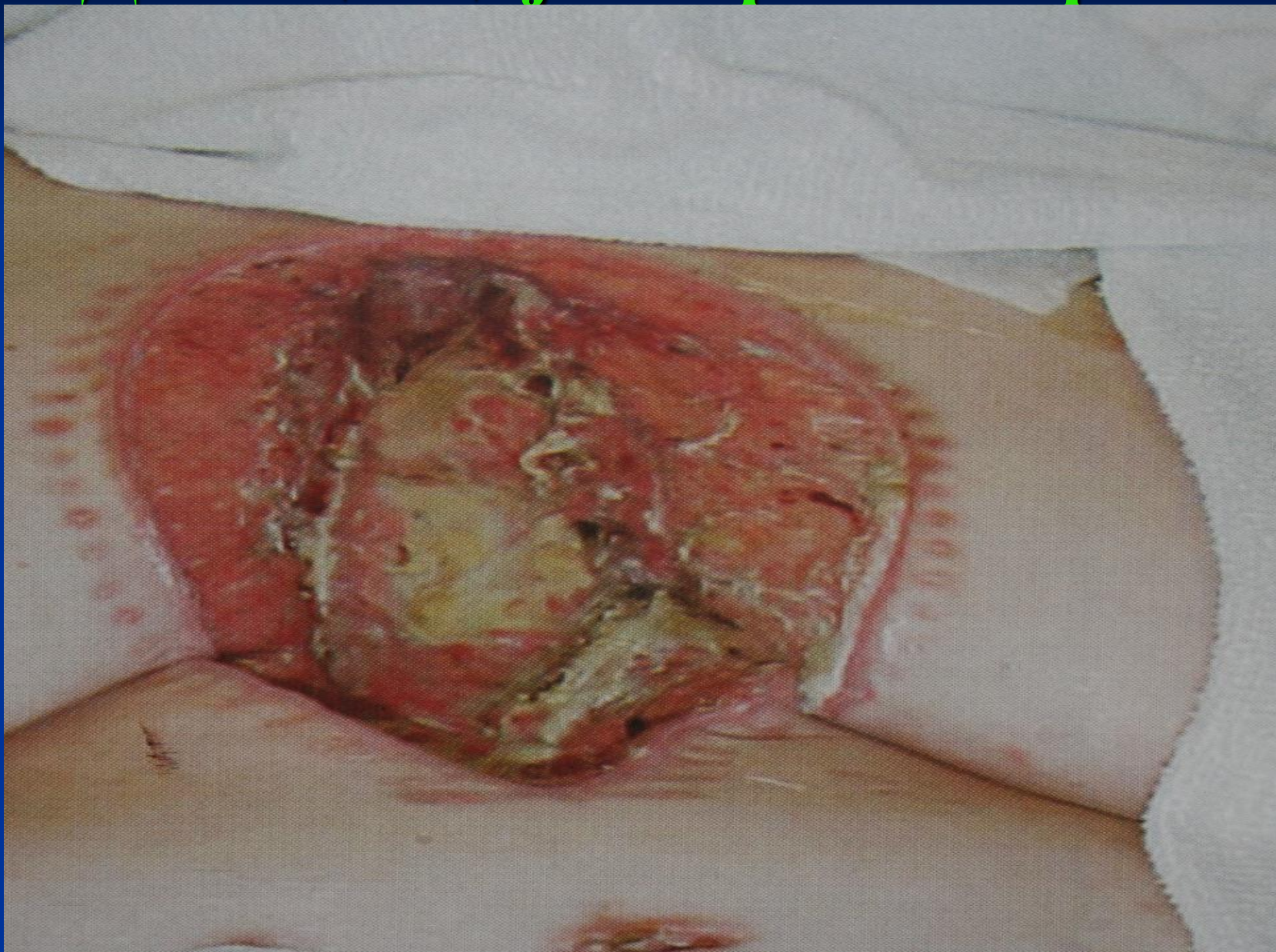
Category	0	1	2	3	9
Age		< 6 hrs	6 to 24 hrs	> 24 hrs	
Classification		Small, sharp, clean edges; superficial	Ragged, irregular margins; moderate depth	Irregular edges, necrotic tissue, foreign body and drainage	
Depth	Presence of concomitant disease = 1 additional point	Only epidermis and dermis	Through dermis with no structural involvement	Through dermis with structural involvement	
Footwear		None	Stockings	Stockings and shoes	
Radiographic Exam	No evidence of osseous involvement				Osseous involvement 

Устрелина

vulnus sclopetarium



Дехисценција оперативне ране



Хронична рана као последица инфламације



Хронична рана (*ulcus*) као последица неуропатије стопала



Третман ране

