



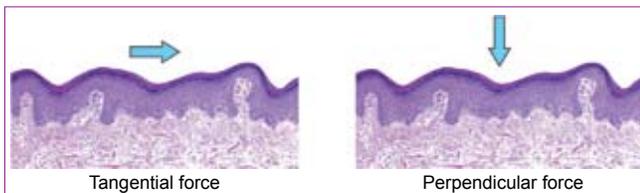
*Mechanical injuries are injuries produced by mechanical force – blunt, sharp or firearms.*

### I. General Principles

The severity and extent of mechanical injuries depend on the following factors: (1) **Amount of force** delivered to the body - If the weapon deforms or breaks on impact, some energy is spent in deformation or breaking. *Lesser energy is thus delivered to the body. Injury is less severe.* (2) **Time period** over which the force is delivered - If the **body moves with the blow**, the **period of time** over which the energy is delivered is **increased**. *Injury is correspondingly less severe.* (3) **The region struck** – If the region struck is pliable and contains gas (e.g. abdomen), same force would produce *less severe injury*, than if the region struck is hard and does not contain gas (e.g. head) (4) **Extent of body surface** over which the force is delivered - For any given amount of force, **the greater the area** over which it is delivered (e.g. back), the **less severe the wound** (lesser energy is delivered per unit area). If **area of contact is less** (e.g. top of the head), the wound is more severe (more energy is delivered per unit area). (5) **Nature of weapon** - Weapons with large surfaces (e.g. a sheet of plywood), deliver energy over larger areas. *Less severe injury is produced.* Weapons with small surfaces (e.g. a lathi), deliver energy over smaller areas. *More severe injury is produced.*

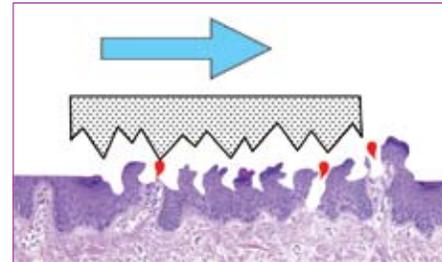
### II. Abrasions

*An abrasion is an injury involving destruction of epidermal layers of the skin and dermal papillae. Salient features:* (1) **Force** - producing abrasions can be of two types (a) tangential (b) perpendicular

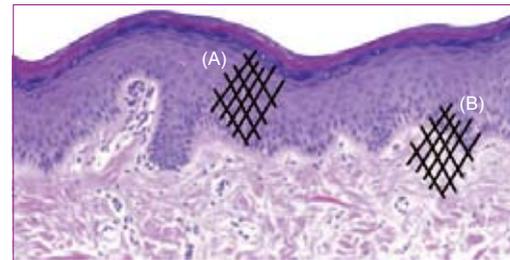


**Fig. 12.1:** Tangential and perpendicular forces, producing abrasions. Please see text for details

(2) **Effects** - *Tangential force* generally produces *scratch and graze abrasions*, while *perpendicular force* produces *pressure and imprint abrasions* (Fig 12.1, Fig 12.2). Most commonly the force involves a mixture of the two. (3) **Healing** - Abrasions always *heal without scarring*. If the injury extends to *subepidermal areas [below the level of dermal papillae]*, it would result in *superficial scarring*. They are termed as *superficial lacerations* (Fig 12.3). (4) **Weapons** - with *rougher surfaces* and with *more movement* produce more severe abrasions. (5) **On a wet skin** – difficult to see. Become more prominent after the skin dries. Body recovered from drowning must be allowed to dry before inspection begins. (6)



**Fig. 12.2:** Production of an abrasion by a tangential force. Wherever dermal papillae are involved, bleeding points have resulted.



**Fig. 12.3:** (A) A typical abrasion is confined to the epidermis. (B) Injury below the level of papillae are superficial lacerations. Please see text for details.

**On drying** – abrasions become dark brown or black (7) **Description** – Each abrasion must be described separately

#### A. Types of Abrasions

##### 1. Scratch abrasions

*Scratch abrasions [syn, linear abrasions, scrapes, scratches] are abrasions with appreciable length, but no significant width* (Fig 12.4). **Salient features:** (1) **How produced** - They are typically produced by sharp, pointed objects such as *fingernails, pins or thorns*.



**Fig. 12.4:** Multiple partially healed linear abrasions on the forearm (self-inflicted).

(a) When produced by tip of knife or razor, they are called *point scratches*. (b) *Nails* produce typically *curved scratch abrasions*, known as *semilunar abrasions*. Abrasions