

SHOTGUN INJURIES

Smooth bore weapons

- Smooth lining barrel
- Customary length is 24-28 inches
- Less than this is described as sawn off
- Fire multiple projectiles



CARTRIDGE

is a completely assembled round of ammunition, which

includes

cartridge case

primer

powder charge

projectile

wadding

pellets.

Slug

is a single solid projectile for a smooth bore weapon.

(Generally, pellets are the projectiles in shotguns).

Wad

- Made from paper ,card board, felt
- Now replaced with plastic
- Two plastic cups separated by spring action
- George cross



Following constituents of the cartridge may contribute to the wound: -

Lead pellets

Soot (smoke and debris)

Unburned and burning propellant particles

Flame/hot gases under pressure

Wads

Detonator constituents

Carbon monoxide

TERMINOLOGY

Breach/Muzzle ends

CHOKE:

Degree of choke determine by

%age of shot pellets fall within 30inches on the target

When test fired from distance of 30 yards

Percentage striking is directly related to choking

Characteristics of shot gun injuries

- Larger
- More destructive
- Fatal at close range especially at head
- .
Exit wound usually absent

CONTACT WOUND

When muzzle is placed firmly against body surface

- **A single wound of entry**
- **Generally circular shape.**
- **Size equal to bore of the weapon.**
- **Split of skin in scalp**

Tattooing, blackening and burning is minimal

- **Wads inside wound.**
- **Muzzle impression**
- **Pinkish discoloration of tissues in wound track due to CO**

Loose contact

- **If muzzle pressed loosely against the target**
- Escape of gaseous and fine particulate
- Create black rim of soot/un burnt powder
- Symmetry depends upon angle at which weapon is held against the body
- Margins scorched
- Gas cloud contains carbon monoxide

Near contact wound (up to 6 inches)

- **On naked skin, following features are produced.**
 - **Singeing of hairs**
 - **Skin burns**
 - **Smoke/soot soiling around wound**
 - **Partly burnt/unburned flakes or grains of propellant on the surrounding skin.**
 - **Wound is circular or elliptical, depending on the angle of fire**
 - **wads inside**

SHORT RANGE WOUND

Intermediate injury

- Diameter of central entry wound remain same for all chokes.
- Shot tends to disperse beyond this range.
- No tattooing/no wad.
- Up to 1m diameter of central wound.
- **Beyond 1 meter**
- Wound may be scalloped
- Punched out with pastry/cookie cutter(cookie cutter etching)
- Diameter depends upon choke and bore of the weapon

- **Beyond 2 meter**
- Mass of shot begins to breakup
- Irregular margins
- Satellite pellets hole

Billiard ball ricochet effect

- Close range shot gun firing
- while the shot strike some intermediary object before striking target tissue
- may spread widely like long range firing .

DISTANT RANGE WOUND

(> ~ 6 feet)

- **No soot, burning effect**
- **Number of satellite pellet holes increases progressively around the main wound**
- **The wad often takes the lower trajectory and may strike below the main wound, (up to 15 feet distance)**
- **Beyond 6 – 10 m, the central hole may shrink to nothing**

Test firing

is the ultimate method to determine range of fire, if the alleged shotgun and the ammunition are available.

An Old, but inaccurate, rule of thumb, states

No of inches of spread = yards in range
i.e. 7 inch group = 7 yard fire

Or

1/3 of spread in cms = Meters in range
i.e. 12 cm group = 4 m in range

EXIT WOUND IN SHOT GUN INJURIES

Exit wounds are **uncommon** in trunk of adults.

extremely large exit wounds may be produced in head, neck, limbs, and in children

No cavitation effect.

Investigations

- X-ray shows snow storm appearance
- Fluoroscopy
- MRI
- Scanning electron microscope
- Spectrography
- Infrared photography