revolver

Firearm injuries

* 50% MSK viva
* 2-3 stations OSPE

DR. ANWAAR

DEFINITION

"Firearm is an instrument or device used to propel the projectile using the expansile force of gases generated as a result of combustion of explosive material."

AMMUNITION

"substance / material used to cause explosion i.e. the ingredients used such as bullet, pellets, powder, primers

BALLISTICS

"science that deals with the investigation of firearms, ammunition & effects arising from their use."
subdivided into three types:-

1. Proximal (internal) ballistics :- study of firearms & projectiles used
2. Intermediate (external) ballistics :- study of movement or motion of projectile after it exits the barrel of gun till the time it hits the target.

3. Terminal (wound) ballistics :- study of injuries produced on target by firearm.

Classification:

A) ACCORDING TO CONDITION OF BARREL

(inner surface of barrel is seen)

1. Smooth bore firearm (shotgun)
2. Rifled firearm → if inner surface has spiral grooves

THESE 2 are mainly used to cause injuries in HUMANS

3. Air guns for birds etc.
4. Stud guns :- to fire nails, studs etc... to insert in steel (used by mechanics)

usually not used to produce injuries on human body

gauge / bore → inner diameter / surface / lumen of barrel (Lt)

B. ACCORDING TO MUZZLE VELOCITY

(speed of projectile when it leaves muzzle end)

1. Low velocity (upto 1200 ft/s)
   ↓ e.g. revolver, pistol.
2. Medium velocity (b/w 1200 - 2500 ft/s)
3. High velocity (>3000 ft/s)
   e.g. machine gun

Structure of Firearm

① Barrel

hollow steel tube or cylinder

Front end → muzzle end

Posterior/rear end → breech end

Chamber → posterior most (rear) part of the barrel & is wider than rest part of tube or cylinder

↓

accomodates or houses the cartridge to be fired

Breech plate → The metal plate on backside of chamber

② Grip or butt or stock:

rear part of firearm & is held either in hand (e.g. in case of pistol or revolver)

or

can be supported by shoulder (e.g. military rifle)

③ Action

① **Trigger** → when pulled, causes hammer to strike on posterior part of cartridge & causes bullet / pellet to eject from muzzle end of barrel.

Firing pin perforates breech plate to come inside.

② Trigger guard: metallic rim...
to prevent accidental firing.

③ Bolt: (Block)
(present towards breech end of barrel)
incorporates the Firingpin ① + spring ② & trigger ③

④ Strikes or hammer:
at posterior part of chamber,
with a pointed pin (firing pin) & a spring

Mechanism: Trigger is pulled,
↓
spring action causes to move hammer
↓
Firing pin protudes into the chamber
(from the central hole of breech plate)
↓
firing pin strikes the base of catridge
↓
Striking produces heat & ignites primer present in catridge

gunshot → injury

Smooth Bore Firearm (shotgun)

⇒ usually shoulder rest

⇒ inner surface of barrel is uniformly smooth

⇒ have pellets

⇒ usually of low velocity

Types

A) DEPENDING ON LENGTH OF BARREL
- Long barrel
- Short barrel

B) DEPENDING ON LOADING OF AMMUNITION OR CATRIDGE
- Muzzle loading
- Breech loading

C) DEPENDING ON NUMBER OF BARRELS
- Single barrel
- Double barrel (can be up-down or sideways)
- Multi-barrel (three or more barrels in a row)

PURPOSE:- ① which gun
② which cartridge
③ which gunpowder
④ Distance b/w weapon & victim.

D) DEPENDING ON CHOKING OF BARREL:

- Full choked
- Three-quarter choked
- Half choked
- Quarter choked
- Non-choked

Choking:

"when the terminal part of muzzle end of shotgun becomes narrow & constricted, it is called choking."

Maximum constriction → $\frac{40}{1000}$ of inch (1 mm constriction)

Non-Choking

"barrel is of uniform size from muzzle end to chamber (breech end), has cylinder bore.

Advantages Of Choking

① To keep the pellets compact as a group for long distance during the travel after exiting from muzzle end

(as gravity effect, air resistance, multiple forces act & we want deadly fire)

(2) Prevents dispersion of pellets & act like a single ball, exerting greater impact on victim.
(when together, reinforce each other... velocity increases)

(3) Causes momentary obstruction to the pellets resulting in increased pressure behind the pellets & propels them with greater force.

(4) makes the weapon more lethal.

Cartridge

(ammunition for firearms, loaded into the chamber)

composed of :-

1) Cartridge Case :- (outer case / covering)

- cylindrical
- made of special paper / cardboard / plastic material.

2 ends:

Base - Made up of metal plate (usually brass)
- Has a central part called as "percussion cap" (primer cap) / primer residue
- Primer cup contains detonator (produces spark)

may be rimmed or grooved.

Anterior end: open & covered by cardboard.

Function of Cartridge Case:

- Holds explosive agents together
- Prevents backward escape of gases
- Provides waterproof cover for gunpowder.

2. Detonator (primer):

- stored in primer cup (percussion cap).
- Purpose is to ignite the gunpowder.

COMPOSITION:

1. Mercury fulminate or lead azide
2. Potassium chlorate
3. Antimony sulphide.

3. Propellant: (gunpowder)

(Combustion of gunpowder produces hot gases under tremendous pressure & causes propelling out of pellets/bullets from firearm with velocity)

- **Black Powder**

COMPOSITION:
- 75% potassium nitrite
- 15% charcoal
- 10% sulphur

OSPE ✓

⇒ SINGLE GRAIN OF BLACK POWDER PRODUCES 200 to 250cc of gas (composed of CO, CO_2, N_2, H_2, O_2)

⇒ does more blackening, effect clearly visible on body, shows the range from which firing was done

Smokeless Powder

1. Single base - consists of "nitrocellulose"
2. Double base - consists of combination of "nitrocellulose & nitroglycerine."
3. Triple base - consists of combination of "nitro cellulose, nitroglycerine & nitroguanidine."

⇒ Minimal smoke produce; not much blackening effect.

⇒ Most effective explosive & imparts higher velocity to projectile

⇒ Single grain can generate 800-900 cc of gas (4 times more powerful)

Semi-Smokeless Powder

composed of
20 percent smokeless powder &
80 percent black powder

4. Projectile:

- Smooth bore weapons have projectiles in form of pellets (shots)
  comprise of multiple spherical balls of lead.
  (of diff. size .. v. small to v. large)
- small size - bird shots (shooting) for birds

=for large animals ... large size

(slutch shots) of any design

↳ to kill elephant / lion

(v. large)

5. Wad :- (aircushion in catridge)

- rounded, compressed disk
- placed b/w pellets & gunpowder
- made from compressed paper, felt, plastic, glazed-board, strawboard, with etc.

⇒ diameter of wad is more so as to occlude the lumen of barrel

↓

acts as a piston & seals off bore

↓

resistance ... so that when gunpowder burns, resistance is offered

↓

more effectively pressure on pellets is applied

⇒ often wad is impregnated with grease to lubricate bore

CATRIDGE CASE FROM BELOW UPWARDS

1. Percussion cap
2. Gun powder
3. Cardboard
4. Wad
5. Cardboard

② Pellets or shot
③ Cardboard

Components of Blast

1) Projectile in form of bullet
2) Flame
3) Gases
4) Gunpowder (completely burned / partly burned / unburned grains) → in form of smoke / Carbon
   Upto 1½ foot 150cm
5) Wad
6) Cardboard pieces — plastic shell, brass metal plate

بندوق کے اندر سے باہر نکلتا ہے

Full choke (now used)

½ 1m / 3 feet from muzzle end, pellets remain as single mass

then disperse . . .

(some have low velocity, fall on floor, some reach target & hit

some hit the body & fall,

some penetrate skin & are present in S/C tissue)

⇒ most pellets recovered on autopsy
(first X-ray is done ...
jahan jahan parey hotey, wahan cut
nikal letey)

(Unchoked) pellets start spreading from
1½ feet

Range of various components
(in smooth bore firearm)

Components	Distance travelled
Flame	30cm (upto 1 foot)
Smoke (carbon) (completely burnt gun powder)	50cm (approx. 1½ foot) max. 2 foot
Gunpowder (unburnt & partly burnt) (a bit heavy)	100cm (1 metre / 3 feet)
Cardboard	2 meter
Wad (v. large mass)	2-5 meter
Pellets	in full choked gun → compact mass upto 45cm (1 metre) & then begins to disperse

max. range approx 20-30 feet ... then itni kam velocity hai body ko touch karty he gir jatey ... bruises only

(Gases) → ek dam jaisay hi niklein ... phel jaeng ... will cool down & will have no effect ... unless & until it is contact wound

Scanned with CamScanner

Components	Effects produced on body
Flame	Burning (scorching of skin) / singeing of hair
Projectile	- Entry & exit wounds - Abrasion / contusion collar
Gun smoke & soot	Smudging / blackening
Gunpowder particles	Tattooing
Gases	Blast effect / cherry red discoloration
Metal particles	Metal ring
Grease or dirt	Grease collar

Contact Shot

(when the weapon is strongly held / pressed against the skin & fired)

- wound is usually single

- if soft part of the body e.g. abdomen

ALL THE COMPONENTS WILL ENTER INTO THE BODY

- if e.g. sternum or skull - (where immediately below skin, bone is present)

gases will penetrate skin but will be reflected back from bone as v. light

tags are found

(cause Tearing / laceration of the skin → Blast effect of gases / Blow back effect

irregular wound produced
(star shaped / irregular)
cruciate

burr of the pressure of high expanding gases in contact injuries

especially over the areas where bone is present beneath skin

- completely burnt powder .. blackening

TO DIAGNOSE blackening...

cotton thora sa gheela hua hai phuein to us par ek jata

(can be wiped off with help of cotton)

or may be abraded appearing black in color

partly burnt & unburnt → heavier, move with force, strike the skin & get embedded into the skin.

Tattooing

Entry Wound

Contact Shot:

⇒ **POSITION OF FIREARM:**
in firm contact with the skin.

⇒ **WOUND:**
single (travel in group)

⇒ **SOILING:** (absent) no blackening, no tattooing
minimal, usually absent because muzzle end is in immediate contact with skin
(direct ander chala jayega)
No soiling / blackening or tatooing around entry wound)

⇒ **SHAPE OF WOUND:** (thigh / abdomen etc.)
circular,
but where skin immediately supported by bone → stars / irregular
(e.g. skull / sternum) esuciate shaped.

IMPRINT = ABRASION + MUZZLE IMPRINT

⇒ **COLOR:**
all gases enter wound, CO combines with Hb & forms carbonyHb
& gives cherry red color to the inside of wound.

(agar there sa fat ha, use this exclude)

⇒ EDGES created due to blast effect

⇒ FLAME EFFECT : (inside the wound, not around the wound)
as in contact, so flame also goes inside wound
under blackening, scorching of tissues (thora nazr aye ji)

⇒ PELLETS
all the projectiles enter the body

Close Range (within 15cm / 6 inches)

(bunch of pellets will exit the muzzle end, travel in a group upto 1 metre, as 6 inches ↙ will travel as a bunch)

↓ hit skin & enter into body

Flame effect (in range of flame) (not > 1 foot)
↳ BURNING OF SKIN AROUND THE WOUND
SCORCHING OF SKIN,
SINGEING OF HAIR

⇒ Bunch of projectiles enter

⇒ EDGES INWARD

⇒ v. minimal effect of hot expanding gases

⇒ Blackening (caution), tattooing present
(lastly)

soiling → combination of blackening & tattooing

blackening immediately next to wound, tattooing is abt spread

dark spots either yellow / red / black as partly / unburnt

⇒ CHERRY RED COLOR : .. such effect of gases (CO)

⇒ ROUNDED SHAPE, PROJECTILES ENTER AS A BUNCH

Short Range

⇒ RANGE 15cm - 1 metre (6 inch - 1 metre or 3 feet)
length of arm

⇒ FLAME (up to 1 foot burn) if no flame effect (burning / singeing) ⇒ means more than 1 foot

⇒ BLACKENING (as 1½ - 2 foot) : if no blackening ⇒ means more than 2 foot

if tattooing present, but no blackening ⇒ means more than 2 foot, but less than 1 metre / 3 feet

if burning present → less than 1 m.

⇒ Pallets will travel as a bunch upto 2 feet
&
enter
↓
wound / circular wound

In full-choked gun, pallets travel in a bunch upto a distance of 1 metre
& then disperse a bit
↓
wound appearance is like
rodent bite margins
or
nibbling edges

After 1 m...
central hole becomes small ... as spread of pallets ↑
↳ individual pellet injuries increase in number

At last, central hole disappears
& all individual pelted injuries

Rifled ka bhi aik entry wound + yahan bhi (if bunch enters)

differ by X-ray → bullet → either exit or if present, detected on X-ray
→ pallets → andar ja kai phel jatay

All of firearm injuries are X-rayed

Medium Range

⇒ **RANGE:** 1m - 4m

⇒ **NO FLAME EFFECT** (2m → no flame effect (+ no blackening / tattooing))

⇒ ~~clotted blood can be seen...~~

some pellets are made hard
with lead, antimony is added to made hard
&
increase travelling distance
&
effectively hit body & damage.

⇒ Individual entry wounds appear.

⇒ Wad can do a separate injury (wad,) 2-5m ... depends
if felt ... if plastic → heavy

Distant Range

(more than 4m)

⇒ no central hole

⇒ Individual pellet injuries

⇒ Skin penetration is possible, usually lie in S/c tissues

⇒ **No** effect of blast components.
(flame, powder, wads)

Exit Wound

- Uncommon
(except for few conditions e.g. contact firearm injury — enters with full velocity)
or part of the body where it hit should be thin
e.g. limb (forearm) or neck

⇒ But usually remain inside
*(inside pellets) X-ray taken
attached to PM report

Features:

- No flame effect ...
- Edges are everted
- Bleeding more as compared to entry wound
- Internal tracts are v. diffuse (phelay hey)

one entry.. but e.g. of 10 pellets 10 can exit

• Unusual Ballistic Effects:

- Balling or welding effect:-

cartridge has shelf life ...
as soft metals - lead ... used to make pellets
↓
so sometimes stick together inside cartridge
↓
when fired, travel as a bunch for several metres
&
upon hitting target, give false appearence that were shot from near range
(but no flame effect etc.)

- Billiard ball ricochet effect:

(groups scatters)
↓
when bunch of pellets travels, &
hit the skin before 1m
↓
sometimes strike each other
&
spread like a billiard ball in the body over a wide area
↓
v. close .. but no central hole
& all pellets spread
↓
but blackening, tattooing etc. are present

- can even occur on 1 foot

bore/guage → inside diameter of smooth bore

Rifled firearms

- more dangerous than smooth bore

Rifle: as inside of barrel... is spiral grooved

Rifling of a gun:

inside of barrel is cut into spiral grooves
&
run logitudinally from breech to muzzle end
(twist spirally ... parallel to each other)

cuttings → depression, lines → elevated
↓ ↓
grooves lands

rifle → land to land distance
↓
calibre ← bore

⇒ Each rifled firearm has own rifling's pattern.
↓
- spiral grooves vary from 2 to 20 in number
↓
width also varies

groove marks: marks are imprinted on bullet

- bullets when recovered from crime scene / dead body

↓

in ballistic lab testing is done

↓

bullet helps in identifying the weapon used in crime

(TRACE EVIDENCE)

- Rifling gives spinning movement

overcomes every resistance

↓

Gyroscopic stability

- Rifling increases the penetration power of the bullet.

as it hits

↓

penetrate skin, muscles, bones & exit..

- Rifling prevents wobbling (misbalance)

(spinning keeps it in uniformly balance state)

- Rifling increases the accuracy of the target aimed

- Rifling increases the distance travelled by the bullet.

- CLASSIFICATION OF RIFLED FIREARM

- Depending on length of barrel

  - Short barreled → pistol, revolver
  - Long barreled → machine guns, Kalashnikhoves

revolver → Russian roulette

- Depending on muzzle velocity

  - High - Medium - Low

- Cartridge case (smooth bow : plastic, base made of brass)

  ↳ full metal cartridge (golden) (bullet fixed on top)

Detonator... same composition

⇒ Bullet has a groove to keep it fixed in cartridge case

↳ CANNELURE

nose of the bullet / catridge

Types of Bullets

(whole design of bullet depends on NOSE)

nose of bullet

(either hollow point / square / flat nose)

1) Jacketed Bullet: (metal jacket)

- Full metal jacket bullet
- Semi-jacket bullet

Hollow nose → creates a large wound / big lacerated wound

when designed..

purpose is to cause more extensive damage to enemies

2) Dumdum Bullet:

↓

hollow nose

3) Mushroom Bullet:

expands on hitting the target → to cause more severe damage

4) Explosive Bullet:

further explosives added to cause explosion upon hitting target.

5) Plastic Bullet: made of PVC & used to control riots

(or rubber)

only causes bruise

6) Tandem / Piggy back Bullet:

ammunition / weapon is old ... will weapon

... defective ... may be some issue in catridge

one fire done .. bullet not emitted .. stuck in barrel

⇒ Upon second fire, second bullet comes along with first

↓

sometimes bullet can burst ....

↓

more than 1 bullet in human body with single entry wound

can cause damage to the person who was firing

single entry wound ... but on X-ray ... 2...

↓

if exit wounds 2

↓

but exit is rare as they are deformed

7) **Souvenir Bullet**

(if a bullet remains embedded in the body for a long time)

↳ gets encovered by encapsulation tissue.

8) **Frangible Bullet**

... intended to disintegrate into tiny particles upon target impact to minimize their penetration of other objects

Rifling Marks

* **Primary** ⇒ produced by grooves & lands present in barrel of rifled firearm.

⇒ are parallel & spiral

* **Secondary** ⇒ due to certain individual features of inner surface of barrel like minor projections, or elevations & depressions.

⇒ are specific for a particular gun. → extensive damage

v.v. high velocity weapons

Injuries caused by Rifled Firearms

(Gunshot wounds)

✓ 9mp

⇒ when the bullet enters the body, makes a lacerated wound

↓ (Entry wound)

exit wound ... also lacerated

⇒ Distance b/w entry & exit wound; path taken by the bullet is known as "Track of injury" → usually it is dissected during autopsy.. as there are many bullets & it can't be found which bullet has exited from where

⇒ Distance b/w muzzle end of barrel & target

↓

Range of firing

⇒ sometimes e.g. 4 entries, 3 exits ...

↳ you have to dissect track to find out which bullet has not exited

Components of firearm blast :-

1) Projectile (Bullet) (Entry & exit wounds)
2) Gun smoke (Blackening)
3) Gunpowder particles (unburnt & partly burnt) (Tattooing)

4) Gases (Blast effect) & red discoloration (due to carbony Hb)

5) Flame (Singeing of hair, scorching of skin)

↓

6) Metal particles

(when bullet goes through sifting, some metal particles come from barrel or separate from bullet ↓ but travel with bullet) upto certain distance

(lead piece)

(Lead ring) around entry wound

in most cases are present

↓

X-ray or neutron activation analysis is required to observe

(skin around entry wound is dissected & sent for examination)

7) Grease

barrel/weapon is kept greased

if it is having dust or other particles, during firing there is risk of blast

Lubricant with bullet deposited on entry wound

↓

(Grease collar)

FEATURES

⇒ when rifled bullet strikes the skin, it is still spinning

⇒ as skin is elastic tissue, gets stretched as offers resistance to enter

↓

spinning movement produces friction on stretched skin

&

causes perforation

↓

friction causes an abrasion

present at EVERY DISTANCE

e.g. 9mm

" "

known as **Collar of abrasion**

(friction rub during perforation)

tells direction of bullet ⇒ if coming perpendicular → collar of abrasion is present circumferentially (round)

visually 0.3cm in size

⇒ if coming at angle (e.g. from right side obliquely enters) → more collar of abrasion on site of entry

Margins

Entry wound → inverted margins but can be everted in CONTACT WOUNDS

⇒ rifled firearms can produce blast effect even in yielding surfaces e.g. abdomen

(in contact injuries)

(gases are reflected back due to resistance of the tissues)

(as of v.v. high velocity)

Laceration of margins & everted margins, protusion of fats & tissues from the entry wound

Grease collar: due to lubrication of barrel.

Burning of skin due to flame

Peppering / stippling (Tattooing)

Smudging (Blackening)

2nd pic — don't see entry wound . . blood clots . . look can change
tattooing nahi hai . . . as if is present all around
ooper sai

Color cherry red due to carbony Hb

Lead ring

Blast effect

if both collar of abrasion & grease collar are present,

✓ grease collar is present inside ... blachened .. if touch with finger .. greasy . . .
as collar of abrasion is much thick

✓✓ in rifled firearm, more nearer the range of firing, more big wound formed
(bcoz of elasticity of the skin, contracts again . .

⇒ rifled firearm produces 2 wounds (exit, entry)

⇒ if one wound,

✓ either the bullet is present inside the body
OR
✓ v. rarely it may exit from same entry (if velocity was v. low, only hit the body, small entry made & then falls)
OR
✓ v.v. rarely may be lost in vomit or feces

⇒ Appearence of entry wound depends on

① **Range** — Contact (in firm contact)
Close (range of flame)
Near (" " gunpowder)
Distant (out of range of all)

② **Type of weapon** (how much velocity, caliber of barrel, size of bullet, velocity of bullet, type of ammunition / gunpowder used)

type of weapon + type of bullet (dumdum / frangible etc..)

③ **Part of body hit**

CONTACT SHOT

(POINT BLANK SHOT)

position firm contact

Size Large (as always blast effect)

Shape irregular / star / cruciate / triangular

show muzzle imprint abrasion

Edge everted

Blast components get driven into tract

so
(reddning will be seen in deeper tissues, but on upper surface wound is black)
↳ flame effect, powder...

due to (blast effect)

CONTACT WOUND ON HEAD

(pistol / revolver / not with high velocity)

some findings are produced which tell about entry & exit

e.g. TO DIAGNOSE ENTRY & EXIT WOUNDS IN SKELETONIZED BODIES

Bevelling Phenomenon

⇒ skull bone has 2 tables (inner table & outer)

⇒ when bullet makes entry wound, first it hits outer table & then inner table)

⇒ when exit, first inner table & then outer)

ENTRY WOUND:

⇒ outer table is supported by the inner table & inner table has no support... soft tissue... brain present inside

⇒ when bullet makes entry wound on outer table,

clean cut

it is circular in shape (due to support of inner table)

↓

punched-in lesion

⇒ inner table has no support

↓

beveling phenomenon produced

(sloping edge produced) (bone chipped off)

(Beveling crater)

EXIT WOUND: vice versa

⇒ first hits inner table (supported by outer table)

↓

so clean-cut,

punched-out lesion

⇒ but outer table is unsupported (outside is an)

↓

sloping edge,

beveling crater

→ when fired on skull, & is in range of black powder,

if blackening is not found on skin,

it is found on pericranium

skull bone ....

BACK SPATTER

when in
especially contact range,
temperature of barrel is v. high
due to hot expanding gases
, as gases escape/expel,
negative pressure in barrel is created

↓

sucks back blood, tissues, hairs, fibres
↳ were in barrel

⇒ when police recovers firearm weapon,
back spatter is seen
(if close range / contact shot)

↓

any blood etc. seen in barrel

↓

then matched with samples taken in autopsy
(to see whether this weapon was used to kill person or not)

Blood spatter blood on the hand of person who fires.

↓

if person caught at that time, sample taken & matched with autopsy samples

⇒ usually pistol, revolvers are used for suicide
↳ cannot cause bursting of skull

Kronlein Shot

usually HOMICIDAL

very high velocity weapons if fired in contact with skull

skull bursts & brain is eviscerated

entry & exit cannot be differentiated (as whole skull burst outs)

CLOSE SHOT

(range of FLAME)

Shape: circular / elliptical (if coming from side) or egg shaped

Collar of abrasion, grease collar, burning, blackening, tattooing

everything is present

Color cherry red

RANGES OF RIFLED FIREARM

(smooth bore)
(cartridge is v. large)
(explosive material is v. ↑)

Flame	pistol / revolver	3 inch (7.5 cm)
smooth bore → 1 foot (30 cm)	high velocity	6 inches (15 cm)
Smoke		
smooth → 1½ foot	1 foot → (30 cm)	(Blackening)
Gunpowder	1 m (100 cm)	(Tattooing)
3 feet..	(3 feet)	

NEAR SHOT

(range of gunpowder) (1m)

⇒ Blackening comes upto 1 foot, then tattooing remains only

⇒ No flame effect

⇒ Edges are inverted

⇒ No cherry red color (blood won't color will be there)

⇒ Collar of abrasion (will be present, grease collar is present / may be)

DISTANT RANGE

(out of range of components of fireblast)

no flame / gases / gunpowder.

⇒ Shape is circular / elliptical if from sides

⇒ Margins are inverted

⇒ No effect of blast components.

⇒ Collar of abrasion is present, grease collar.

EXIT WOUND

⇒ USUALLY PRESENT, maybe absent

⇒ Maybe multiple (e.g. bullet enters the body, hits the

bone, gets fragmented & all fragments act as separate missiles & exit body separately
(multiple exits with single entry)

or
bone spicules act as missiles

⇒ may vary in size & shape
bcoz of the tumbling of the bullet
↓
end to end movement
(abnormal ")
↓
instead of nose on can enter with base.
(if on striking with bone etc... tumbles.. base exits first)
↓
Shape of exit becomes irregular

⇒ Bullet can get deformed
(usually when bullets are recovered from body are defaimed)
↓
as made of lead.. soft metal

⇒ Edges are everted

⇒ Blast component effects are absent.

Importance of exit wound :-

① No. of bullets inside the body.

② Direction of fire

=) Sometimes, collar of abrasion appears at site of exit

↓

False collar of abrasion

↓

when some part of skin is supported by tight clothing eg. belt / lying on floor etc...

↓

when bullet exits, alot of resistance by skin is offered

↓

abrasion occurs.

stated / supported exit wound

Bullet graze

sometimes bullet hits / strikes the body at such an angle that it just touches the skin, cause abrasion / small laceration & passes off the body without entering it

(graze / slap)

Atypical entry wound:

Large entry wound
e.g. due to deformed bullet....
as shape with intermediate object.

Ricochet bullet

one which is deviated from its path
by
hitting an intermediate object before hitting the target

atypical entry wounds can be formed
as shape can be changed

Multiple entry & exits with single bullet is possible

e.g. if bullet comes from side

first enters right arm... exits...
enters chest.. exits..
enters left arm....

Yawning of bullet

abnormal, irregular

When bullet travels in irregular fashion instead of being nose-on...

Tumbling of bullet

end to end travel ...

artefact, produced by surgical intervention of the wound

Remedy intervention

(usually entry & exits wound
dsc not explored
but exploring entry & exits makes evidence false & is v. difficult to give opinion on either it was entry or exit)
(in surgical manipulated wounds)

AUTOPSY EXAMINATION

① Clothes examination

* Any firearm defect
(any tear / hole
blackening / flame signs /
melting of fibres of clothes can be found)

cloth around entry wound, is encircled & signed or

stain / blood is encircled & signed

② Radiological Examination :

All the people died of firearm injuries, body should be X-rayed

↓

to find no. of bullets inside the body,

to detect any fracture,

to see direction of firing (rod is placed b/w entry & exit & then x-rayed)

+

acts as an evidence

↓

attached & sent with autopsy report

③ Examination of the body

Externally → wounds are seen.

all signs of entry are seen, exit

↓

diagnosed...

→ labelled.... 1a, 1b ...

Internally track of bullet.

" " injury

is dissected

&

any retained bullet is recovered

④ Collection, preservation & forwarding of exhibits / evidences

- Clothes
- Bullets (if they are recovered from the body)
- Skin (from site of entry)

apart from blood, urine, organs etc